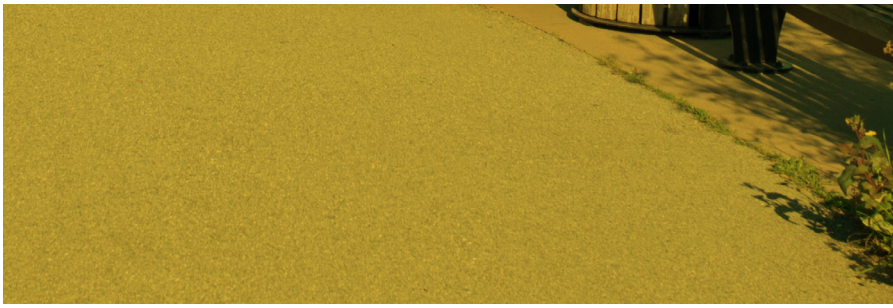
CITY OF SOUTH SAN FRANCISCO

CLIMATE ACTION PLAN



SHAPE SSF

2040 GENERAL PLAN

CITY OF SOUTH SAN FRANCISCO CALIFORNIA

CITY OF SOUTH SAN FRANCISCO

Climate Action Plan

Adopted October 2022
Resolution #178-2022

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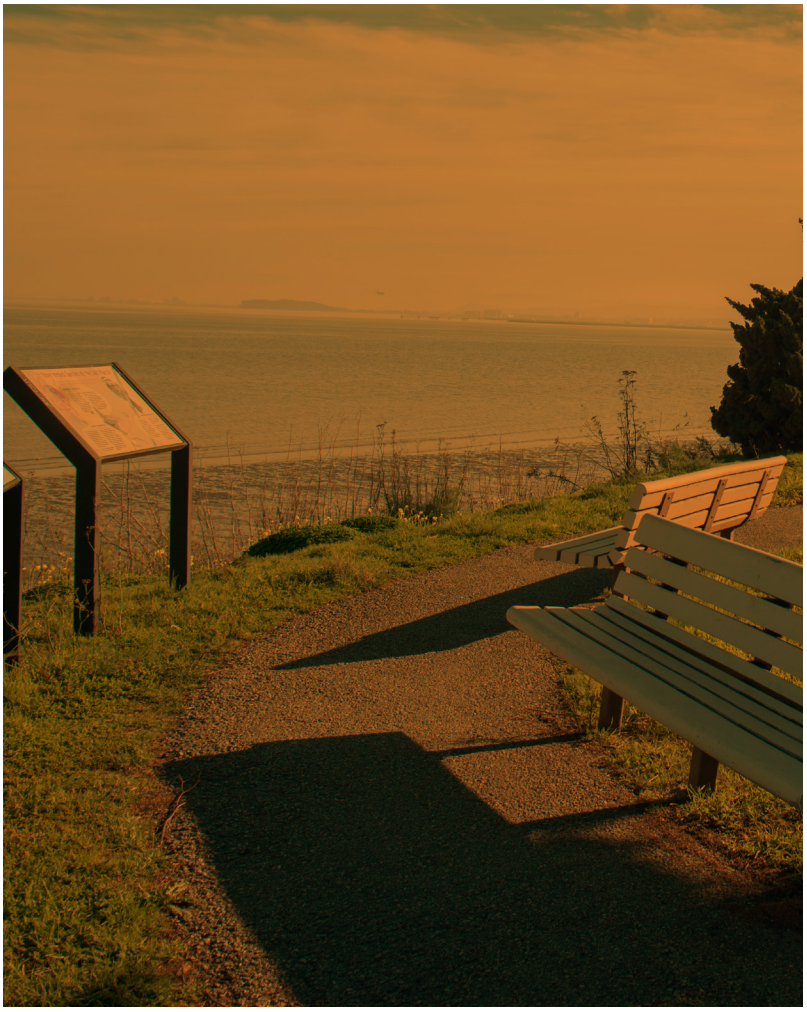


CHAPTER 1

Background

South San Francisco BART Station

1.1 OVERVIEW

Climate change is already affecting California and the San Francisco Bay Area, and these impacts are projected to worsen, even with only moderate increases in greenhouse gas (GHG) emissions. Climate change is not only impacting our natural environment, but also threatening the health and economic vitality of communities across the state. The extent to which South San Francisco is impacted by climate change is dependent on our actions today. By curbing GHG emissions and adapting our community to the already changing environment, we can significantly reduce the damages incurred from climate change. South San Francisco is in a unique position to become a regional climate leader by implementing city-wide policies, incentives, and education programs to deploy new technologies, to pilot regulatory mechanisms, and spark behavioral change to meet the deep greenhouse gas reduction targets established by the State of California. South San Francisco has prepared this Climate Action Plan (CAP) to be a guide for the community's response to challenges posed by climate change, and to build on the City's ongoing efforts to mitigate and adapt to the impacts of climate change.

Developed in concert with the City's General Plan Update, South San Francisco's CAP helps to achieve the community's vision for the future of South San Francisco:

"South San Francisco is a place where everyone can thrive. Its high quality of life, diverse and inclusive community, livable neighborhoods and excellent services, culture of innovation, and environmental leadership ensure all people have the opportunity to reach their full potential."

Additionally, the CAP is designed to fulfill the community's vision for sustainability:

"We strive to build and maintain a healthy and safe city. Our actions reduce climate pollution, adapt to climate disruptions, preserve natural resources, foster a prosperous and just economy, and meet the needs of current and future generations to ensure all people have the opportunity to reach their full potential."

The CAP intends to create a more sustainable community, to equitably mitigate and address the impacts of climate change, and to realize the co-benefits of climate mitigation actions.

To meet this vision by 2040, the CAP lays out strategies and actions to achieve carbon neutrality by 2045 by increasing waste diversion, reducing energy and water use, and increasing resiliency across multiple sectors. The CAP technical GHG reduction analysis is based on the City's most recent community GHG inventory from 2017 and the forecast of future community emissions based on the General Plan update projections. In accordance with the California Environmental Quality Act (CEQA), emissions reductions are compared to the City's 1990 emissions levels.

What is a Climate Action Plan?

A Climate Action Plan is the City's strategic planning document that outlines:

- Current and projected greenhouse gas emissions
- Greenhouse gas emissions reduction targets
- Strategies and actions for reducing emissions
- Projected changes to natural hazards from climate change

The CAP is reflective of South San Francisco's unique environment and community, and it reaffirms the City's environmental leadership in the region.

1.2 PURPOSE

Why Update the CAP?

The City of South San Francisco already plays an important role in shaping community services, including electricity provision, building construction, land use and development, transportation, infrastructure maintenance, solid waste management, parks and open space management and maintenance, and water and wastewater management and treatment. The City is uniquely positioned to lead on climate action, facilitate collaboration and partnerships, and engage residents, businesses, community groups, and other partners, including regional agencies, to join these efforts.

The City of South San Francisco is updating its original 2014 CAP to align with new State regulations and targets related to climate change. Furthermore, the 2014 CAP set an emissions target for 2020 and this updated CAP extends the horizon year to 2040 and sets a long-term goal of carbon neutrality by 2045 to align with State targets. The 2014 CAP set the 2020 target of a 15% decrease in emissions from the baseline year of 2005. Although the City implemented many policies and programs identified in the 2014 CAP, the City experienced steady economic and population growth over that time period. The City's most recent inventory estimates that the City reduced emissions by 2.3% per service population in 2017 as compared to 2005.

This CAP update outlines how the City of South San Francisco will create new policies, programs, and services that will support the community in taking strong action to reduce GHG emissions. By updating its existing CAP, the City of South San Francisco reaffirms its commitment to leading the way to a more sustainable future.

CAP Outcomes

The City has set bold targets and developed strategies for reducing GHG emissions while increasing the city's resilience to climate change impacts. This updated CAP aims to:

1. Achieve carbon neutrality by 2045, reduce emissions 40% by 2030 and 80% by 2040
2. Equitably mitigate and address the impacts of climate change
3. Realize the co-benefits of climate mitigation actions that help create a sustainable community

Through the evaluation of best practices, existing local actions, and State and regional policies, this CAP has identified 62 actions to achieve the following sector specific objectives and mitigate emissions. They are organized into seven topic areas:

Clean energy
» Goal: A resilient and fossil fuel free energy system.

Buildings (existing + new)
» Goal: Green buildings are the standard in South San Francisco for new construction and major renovations.
» Goal: Existing buildings in South San Francisco perform more efficiently and are decarbonized.

Transportation
» Goal: Transportation in South San Francisco is safe, multimodal, sustainable, livable, and connected.

Water
» Goal: Water is used efficiently in South San Francisco to help ensure a safe and resilient water supply.

Solid waste
» Goal: The City continues to divert solid waste and organics from landfill in accordance to State targets.

Carbon sequestration
» Goal: The City increases carbon sequestration in public lands, in open spaces, and in the urban forest though marsh enhancement and tree planting.

City Leadership
» Goal: The environmental performance of municipal buildings and facilities in South San Francisco is more efficient.
» Goal: The South San Francisco – San Bruno Water Quality Control Plant is a model for sustainable, resilient operations.

Equitable Program Implementation

Achieving climate equity will require careful design and execution of policies and programs to improve outcomes for disadvantaged populations in all stages of CAP implementation. When equity is prioritized, climate mitigation strategies can address and lessen existing social, racial, and health disparities.

1. A majority of the local benefits resulting from CAP implementation will be focused in disadvantaged communities by meeting priority community needs, improving public health, building on community assets and values, and increasing community resilience.

2. Required measures do not present an undue cost burden on those least able to afford implementation. Financial and technical assistance will be prioritized for disadvantaged communities and sensitive populations, including renters, to allow them to participate in CAP programs and fully realize all benefits.

For more details, see Section 5.2.

1.3 HOW DO THE CLIMATE ACTION PLAN AND GENERAL PLAN RELATE?

South San Francisco's CAP update has happened concurrently with the General Plan Update process. The General Plan is a long-range policy document that maps out how the City of South San Francisco serves its community. California law requires that every city and county in the state develop and maintain a General Plan. Everything, from our parks to shopping centers to roads, is a result of similar planning efforts. The General Plan sets forth a shared 20-year vision for the future. It builds on community strengths and assets, while tackling new and emerging challenges like climate change.

The South San Francisco General Plan Update articulates its vision for the future through the following twelve elements:

- Land Use and Community Design
- Sub-Areas
- Housing
- A Prosperous Economy For All
- Mobility and Access
- Abundant and Accessible Parks and Recreation
- Community Health and Wellbeing
- Community Resilience
- Equitable Community Services
- Climate Protection
- Environmental and Cultural Stewardship
- Noise

Throughout the General Plan process, community members identified many shared values and beliefs. These cross-cutting community values include diversity and inclusion, livability, sustainability, and innovation. While each guiding principle, goal, policy, and action outline what the City wants to achieve and plans to do, these values describe how future actions should be implemented.

Complementing the vision and direction established in the General Plan, the CAP is a key mechanism to promote climate action. The CAP represents the City's program to reduce greenhouse gas emissions in line with State targets, contributing to statewide efforts to address climate change. The CAP's focus is on a shorter time scale from 1-10 years.

The co-creation of the General Plan and CAP, initiated in 2019 and concluding in 2022, has allowed General Plan and CAP-related analyses to inform the development of both plans and create consistency across long-range planning documents. This consistency will create opportunities to streamline General Plan and CAP policy and program implementation by aligning climate goals with opportunities identified in the General Plan.

This includes:

- **GHG reduction:** see Climate Protection Chapter.
- **Landscape design standards:** see Environmental and Cultural Stewardship Chapter Goal ES-5.
- **Urban forests, landscape design and Colma Creek:** see Environmental and Cultural Stewardship Chapter Goals ES-3, ES-4, and ES-5.
- **Building and facility maintenance:** see Equitable Community Services Chapter Goal ECS-4 and Abundant and Accessible Parks and Recreation Goal PR-7.
- **Transportation:** see Mobility and Access Chapter.

Community Engagement

As a community-centered plan, the CAP has been informed by community outreach and engagement. Since the CAP has been developed as part of the General Plan Update process, many of the CAP's overarching goals and targets were informed through the General Plan's outreach.

CAP-specific outreach has included:

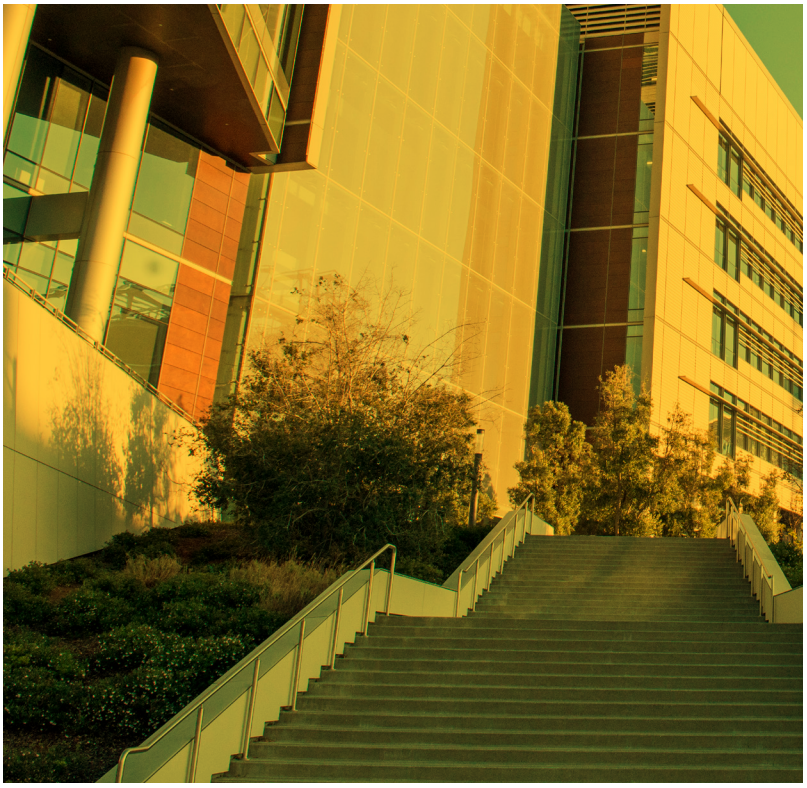
- **General Plan Community Advisory Committee (CAC) Meetings – Components of the CAP have been presented to the CAC throughout the development process.**
  - Meeting 1: Sustainability
  - Meeting 2: Adaptation
  - Meeting 3: Climate Protection policy framework
  - Meeting 4: CAP goals and GHG reduction targets, CAP strategies and actions, and GHG reduction analysis
- **CAC Forum on sea level rise**
- **Planning Commission meetings**
- **Targeted Outreach – To ensure that the perspectives of specific groups were considered in CAP development meetings were conducted with:**
  - Nonresidential building electrification reach code stakeholders
  - South San Francisco Scavengers
- **Public Workshop on climate protection policy framework**

In addition, many ideas incorporated into this CAP were from community engagement gathered from the following General Plan Update activities:

- **Policy frameworks**
- **Surveys**
- **Community workshops**

Shape SSF Visioning Workshop Attendee

Shape SSF Spanish Language Sub-Area Pop-Up Event



CHAPTER 2

Current Conditions

(Left) San Bruno Mountain; (Right) Bay Trail

The City of South San Francisco is located on the San Francisco Peninsula in San Mateo County, about 2.5 miles south of San Francisco, and encompasses approximately 5,000 acres. It is in a basin bounded by San Bruno Mountain to the north, the Coast Range to the west, and the San Francisco Bay to the east. The city is bordered by the cities of Brisbane to the north, Daly City, Pacifica, and Colma to the west, and San Bruno to the south.

The land now known as South San Francisco was inhabited by Ohlone Indians until the late eighteenth century, when Spanish settlers moved into their land. During the 1800s, the area was owned by the Mexican government, then divided into ranches mostly used for cattle grazing, dairy operations, stockyards, and packing plants. During the first half of the twentieth century, steel manufacturers, shipbuilders, lumber companies, and other industries began to call South San Francisco home. The Chamber of Commerce promoted local business by declaring South San Francisco "The Industrial City" and building a large cement sign with this nickname on Sign Hill in 1923.

Today, South San Francisco continues to be a place where people, employers, and others can find opportunities to thrive. As evidenced by South San Francisco's transition from a ranch to the "Industrial City" to the "Birthplace of Biotechnology," the City's identity has evolved significantly over time and will continue to do so in perpetuity.

South San Francisco has undergone much change since the end of the 20th century. As South San Francisco has continued to grow, the demographic characteristics of the City's residents have continued to evolve. The continued growth of jobs has boosted South San Francisco's economy, but the lack of new housing on the Peninsula has contributed to the region's jobs-housing imbalance. The regional jobs-housing balance, as well as the rise in housing costs regionally, has led to increasingly unaffordable housing for many long-time residents and displacement of businesses and residents. Given the enormous growth of the city, its thriving economy, and its core of residential uses, buildings and transportation are the city's greatest contributors to GHG emissions that cause climate change. The risks associated with climate change hazards have also increased, with sea level rise posing the greatest risk to South San Francisco.

1. *History of South San Francisco. (2019). City of South San Francisco. Retrieved From: http://www.ssf.net/home/showdocument?id=128*
2. *City of South San Francisco General Plan. (1999). City of South San Francisco. Retrieved From: http://www.ssf.net/home/showdocument?id=478*
3. *History. (2019). City of South San Francisco. Retrieved From: http://www.ssf.net/our-City/about-south-san-francisco/history*

2.1 CLIMATE CHANGE IN SOUTH SAN FRANCISCO

Climate is the long-term behavior of the atmosphere – typically represented as averages – for a given time of year. This includes average annual temperature, snowpack, or rainfall. Human emissions of carbon dioxide and other greenhouse gas emissions (greenhouse gases) are important drivers of global climate change, and recent changes across the climate system are unprecedented. Greenhouse gases trap heat in the atmosphere, resulting in warming over time. This atmospheric warming leads to other changes in the earth systems, including changing patterns of rainfall and snow, melting of glaciers and ice, and warming of oceans. Human-induced climate change is already affecting many weather and climate extremes in every region across the globe. Evidence of observed changes include heatwaves, heavy precipitation, droughts, and hurricanes.[4]

California and South San Francisco are already experiencing the effects of a changing climate. Both gradual climate change (e.g., sea level rise) and climate hazard events (e.g., extreme heat days) expose people, infrastructure, buildings and properties, and ecosystems to a wide range of stress-inducing and hazardous situations. These hazards and their impacts disproportionately affect the most sensitive populations in the city, including children and elderly adults, low-income populations, renters, immigrants, and Black, Indigenous, and people of color (BIPOC) residents, among others.

While climate projections cannot predict what will happen at a certain date in the future, projections can provide cities with information about what to expect from the climate in the future. For example, climate projections can estimate how much warmer the temperature will be in summer or how many more extreme weather events are likely to occur in the future. Climate projections, however, cannot forecast with precision when those events will actually occur.

Future climate projections are created using global climate models. These models simulate climate conditions both in the past and in the future. Climate scientists can use these models to test how the climate will change (or not) based on scenarios of GHG emissions.

4. *Intergovernmental Panel on Climate Change 2021. Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press. In Press.*

People Conversing on Grand Ave. in Downtown

Some of the climate impacts South San Francisco has experienced, and will continue to experience, include:

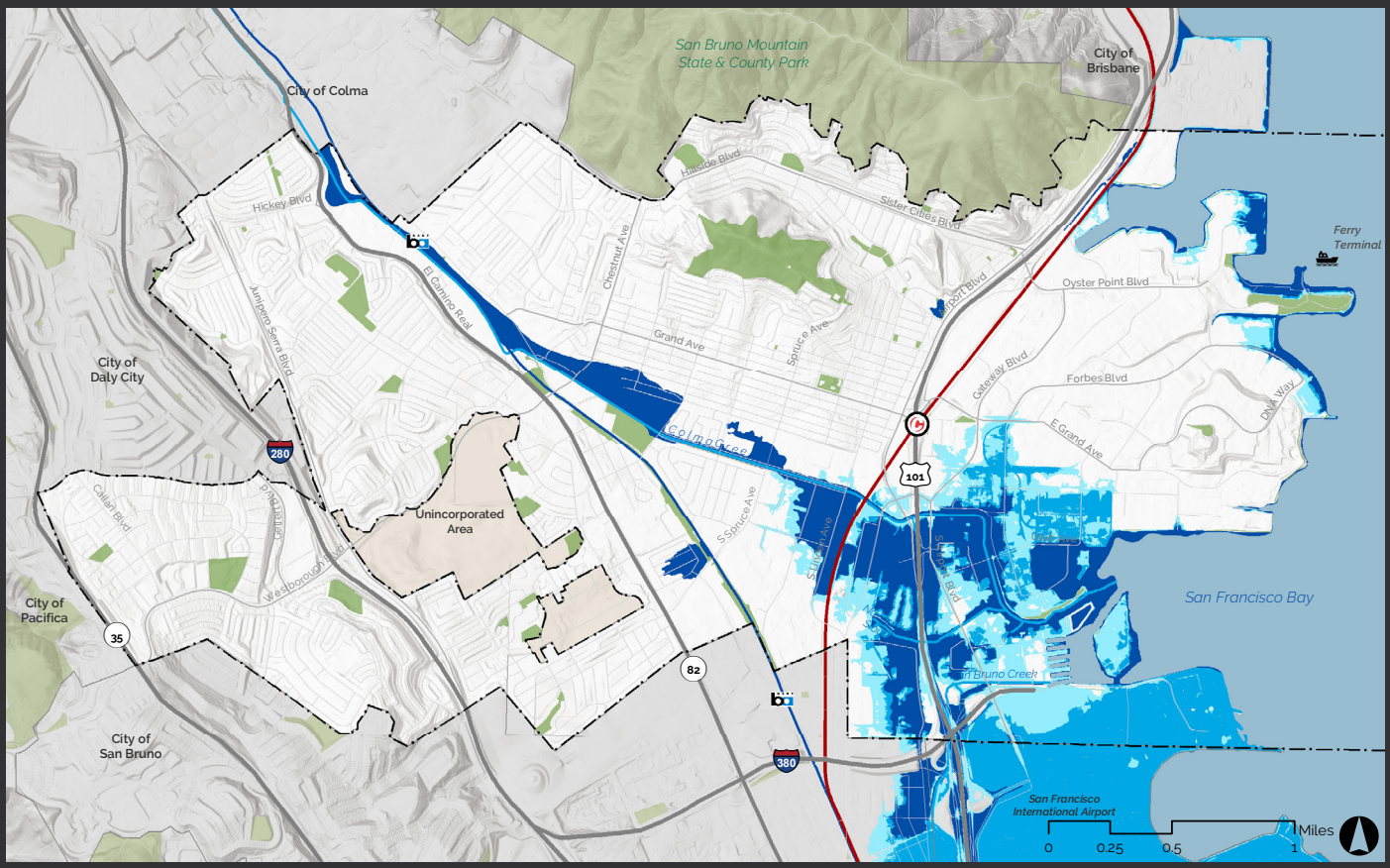
Sea level rise:

In the last 100 years, sea level in the nine county Bay Area has risen over eight inches.[5] San Mateo County recently released a vulnerability assessment that projected a mid-level end of century scenario with about 77 inches of sea level rise.[6] The city is already seeing annual impacts of sea level rise with 1-foot King Tides (extremely high tides) in Oyster Point.

5. *Ackerly, D and et. al. 2018. California Fourth Climate Change Assessment: San Francisco Bay Area Region Report. State of California Governor's Office of Planning and Research. Retrieved from https://www.energy.ca.gov/sites/default/files/2019-07/Reg%20Report-%20SUM-CCCA4-2018-005%20SanFranciscoBayArea.pdf*

6. *Sea Change San Mateo County. 2018. Sea Level Rise Vulnerability Assessment. Retrieved from https://seachangesmc.org/vulnerability-assessment/*

Figure 1: Sea Level Rise Risk *(2100 Mid-level Scenario)*



Sources: Adapting to Rising Tides (2021); City of South San Francisco (2019); County of San Mateo (2019); ESRI (2021).

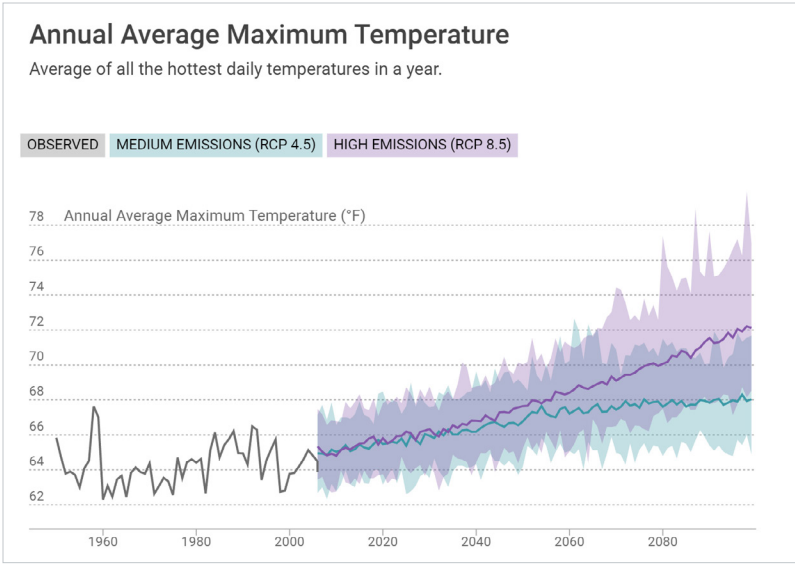
- 100-year Flood Zones
- 52 Inches (100-year flood + 2040 sea level rise)
- 77 Inches (100-year flood + 3ft sea level rise)
- City of South San Francisco
- Unincorporated Area in City Sphere
- Ferry Terminal Station
- Caltrain Station
- Caltrain
- BART Station
- BART
- Highway
- Arterial Road
- Local Road
- City Parks, Open Space, & Joint Facilities
- Context Parks
- Waterbody
- Streams

Extreme heat days:
Extreme heat days and heat waves are predicted to impact larger areas, last longer, and have higher temperatures. In particular, coastal areas in Northern California are projected to experience an increase in humid nighttime heat waves.[7] Historically (1960-1990), there have been four annual average extreme heat days. The number of extreme heat days is anticipated to increase significantly across the Bay Area region during the next century, but more so in inland areas than coastal cities. Even with lower projections along the coast, by mid-century (2040-2060), South San Francisco is expected to have an average of nine extreme heat days under a business-as-usual scenario. By the end of century (2080-2100), South San Francisco is projected to experience an average of twenty-four extreme heat days.

Poor air quality:
Air quality is expected to worsen with climate change. Air quality is strongly dependent on weather, and climate change is expected to impact air quality through warming temperatures and more frequent episodes of stagnant air. Regional wildfire also contributes to poor air quality in the Bay Area.

Effects of Drought on Folsom Lake
Source: "Folsom Lake, California Drought" by Alan Grinberg, licensed under CC BY-NC-ND 2.0

Periods of drought:
Climate change is likely to increase the duration and severity of droughts in California. Increasing temperatures and changing precipitation patterns can create periods of abnormally dry weather that produce hydrologic imbalances and result in water supply shortages. Reduced water supplies can have direct and indirect impacts on natural vegetation, wildlife, agricultural yields, and water supply. Drought can also increase the risk of wildland fires due to dry vegetation, lack of moisture replenishment from overnight humidity typical of coastal areas.



*Annual Average Maximum Temperature in South San Francisco**

Flooding:
Periodic flooding occurs in the City of South San Francisco but is confined to certain areas along Colma Creek, Oyster Point Marina, and East of 101. Colma Creek handles much of the urban runoff generated in the city; since the City of South San Francisco is highly urbanized, runoff levels are high and there is increased potential for flood conditions during periods of heavy rainfall.

These hazards and their impacts disproportionately affect the most vulnerable and marginalized populations in the city. Historical policies rooted in segregation, discrimination, and oppression have caused certain populations to bear a disproportionate share of the consequences of climate change. Although climate hazards have the potential to affect all South San Francisco 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. Although this CAP does not directly address climate adaptation measures, many strategies that are used to reduce greenhouse gases complement the policies and actions in the Community Resilience Element of the General Plan and will increase resiliency to the climate hazards outlined above.

7. *Gershunov, A., and Guirguis, K. (2012). California heat waves in the present and future. Geophysical Research Letters, 39(18), 7.*

* *Data derived from 32 LOCA downscaled climate projections generated to support California's Fourth Climate Change Assessment. Details are described in Pierce et al., 2018. Observed historical data derived from Gridded Observed Meteorological Data. Details are described in Livneh et al., 2015*

2.2 STATE REGULATORY FRAMEWORK

California has established itself as a national leader on climate action. The following section describes key elements of the legislative and regulatory context in California. This legislative framework guided the development of the CAP and GHG forecasting.

Climate Action Targets

Assembly Bill 32 (2006): California Global Warming Solutions Act of 2006.
This Assembly Bill requires the California Air Resources Board (CARB) to adopt a statewide greenhouse gas emissions limit equivalent to the statewide greenhouse gas emissions levels in 1990 to be achieved by 2020. It was California's first GHG reduction target.

Senate Bill 379 (2015): Adaptation and Resiliency Planning
This Senate bill requires cities and counties to include climate adaptation and resiliency strategies in the Safety element of their general plan updates. It must include a set of goals, policies, and objectives based on a vulnerability assessment.

Senate Bill 32 (2016): Greenhouse Gas emission reduction target for 2030
This Senate Bill establishes a statewide greenhouse gas (GHG) emission reduction target of 40% below 1990 levels by 2030.

Climate Change Scoping Plan (2017)
The Climate Change Scoping Plan was approved by CARB in December 2008 and outlines the State's plan to achieve the GHG reductions required in AB 32. The plan directed municipal governments to reduce their emissions by at least 15% by 2020 compared to 2008 levels or earlier. The Scoping Plan was updated in 2017 to reflect the SB 32 target of reducing emissions by 40% under 1990 levels by 2030.

Executive Order B-55-18 (2018): Carbon neutrality by 2045
This Executive Order set a target of statewide carbon neutrality by 2045 and to maintain net negative emissions thereafter.

Clean Energy

Senate Bill 100 (2018): Renewable Portfolio Standard
This Senate bill requires that 100% of all electricity within California be carbon-free by 2040. Electricity providers must procure from eligible renewable energy sources, with interim goals of 40% by 2024 and 50% by 2030.

Transportation

Senate Bill 375 (2008): Greenhouse Gas emission reduction targets for vehicles
The Sustainable Communities & Climate Protection Act of 2008 requires CARB to develop regional greenhouse gas emission reduction targets for passenger vehicles. CARB is to establish targets for 2020 and 2035 for each region covered by one of the State's 18 metropolitan planning organizations.

Senate Bill 743 (2013): Transportation Impacts
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 2127 (2018): Electric Vehicle (EV) charging infrastructure
The California Energy Commission is required 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 5 million zero-emission vehicles on California roads by 2030.

Innovative Clean Transit (2018): Zero emission bus fleets
CARB adopted this rule requiring 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 GVWR above 14,000 lbs.

Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule (2018)
The U.S. Environmental Protection Agency (US EPA) and the National Highway Traffic Safety Administration (NHTSA) issued the SAFE Vehicles Rule. This rule set a vehicle fleet efficiency standard increase of 1.5% per year above 2020 standards through 2026.

Executive Order N-79-20 (2020): Zero Emission Vehicles
In line with the carbon neutrality goal, this Executive Order requires the elimination of new, internal combustion passenger vehicles by 2035

Advanced Clean Truck Rule (2020): Zero emission trucks
CARB adopted this rule requiring 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 – 3 truck sales, 75% of Class 4 – 8 vocational truck sales, and 40% of Class 7-8 truck tractor sales.

Solid Waste

Assembly Bill 341 (2012) and Assembly Bill 1826 (2016): Mandatory Recycling
AB 341 requires all commercial businesses and public entities that generate 4 cubic yards or more of waste per week and all multi-family apartments with five or more units are also required to have a recycling program in place to help meet the state's recycling goal of 75% diversion by 2020. AB 1826 requires all commercial businesses to collect yard trimmings, food scraps, and food-soiled paper for composting

Senate Bill 1383 (2016): Short-lived Climate Pollutants - Organic Waste Reductions
This Senate Bill establishes a statewide target to reduce the disposal of organic waste by 75% by 2025 to reduce methane emissions from organic material in landfills.

Solid Waste Receptacles

2.3 SUSTAINABILITY IN SOUTH SAN FRANCISCO

The City of South San Francisco has a strong history of climate action, having made significant progress implementing the measures included in its 2014 Climate Action Plan, as well as various interrelated environmental sustainability and adaptation objectives throughout the years.

Existing Plans + Policies

2014 CAP:
The 2014 CAP served as the City's primary tool to integrate all City and community efforts to reduce GHG emissions. It set the GHG reduction target in line with AB 32 at 15% below 2005 levels by 2020.

Park and Recreation Master Plan
The Parks and Recreation Master Plan adopted in 2015 provides both a long-term vision for the city's park system, and specific policies and standards to direct day-to-day decisions. It identifies a planning blueprint to improve, protect and expand the city's network of parks, facilities and recreational services for the future.

Resilient South City:
Resilient South City is a community-based design challenge aimed at strengthening the City's resilience to sea level rise and climate change by managing flooding along Colma Creek, creating multifunctional green spaces, creating school resilience hubs, and restoring native riparian ecosystems.

East of 101 Mobility Plan:
The Plan developed an implementation strategy for future Capital Improvement Program budgets by evaluating multi-modal transportation improvements for the job rich area east of US-101 and the Bay waterfront and by incorporating feedback from city residents and employees.

Bicycle and Pedestrian Master Plan
Active South City is the Bicycle and Pedestrian Master Plan for the City of South San Francisco, currently in development and expected to be completed in early 2022. It will update existing plans and identify needs and opportunities to improve walking and bicycling in South City.

Model Water Efficient Landscape Ordinance (MWELO)
South San Francisco adopted MWELO in 2016 to increase landscape water efficiency and provide many other related benefits such as improvements to public health and quality of life, climate change mitigation, replace habitat, and increased property values.

Recovered Organic Waste Product Procurement Policy
Adopted in 2021, the City of South San Francisco incorporated environmental considerations applicable to all City departments and divisions, including recycled-content and recovered Organic Waste Product use into purchasing practices and procurement. This policy will help the City to protect and conserve natural resources, water, and energy; minimize the City's contribution to climate change, pollution, and solid waste disposal; and comply with State requirements as contained in SB 1383 procurement regulations to procure a specified amount of recovered organic waste products to support organic waste disposal reduction targets and markets for products made from recycled and recovered organic waste materials, and to purchase recycled-content paper products.

Urban Forest Master Plan
Adopted in 2020, the Urban Forest Master Plan guides future forestry practices, including maintenance and planting efforts. It includes short-term actions and long-range planning goals to promote sustainability, species diversity, and greater canopy cover throughout South San Francisco.

Tree Preservation Ordinance
The City of South San Francisco updated the Tree Preservation Ordinance in 2016. Under this ordinance essentially no "protected tree" shall be removed or more than one-third of canopy or roots pruned without a permit.

All Electric Residential Reach Code
The City of South San Francisco adopted an all-electric reach code for residential new construction and significant renovations in May 2021. The ordinance also requires EV charging stations to be included in new residential development.

Existing City programs

Peninsula Clean Energy (PCE)
The City joined PCE in 2016 at the default ECO100 tier. This tier provides the City access to carbon free electricity generated 100% by renewable sources. Participating in PCE significantly reduces emissions associated with electricity use in the city.

Public EV Charging Stations
The City has installed 13 EV publicly accessible EV charging stations as part of PG&E's EV Charge Network Program in Miller Garage to promote EV use and ownership in SSF.

Seasonal farmers market
The City hosts a seasonal farmers market to help connect residents to healthy, local food options, bolster the local food system, and reduce food related GHG emissions. The farmers market was put on hold due to the Covid-19 pandemic, but is proposed to be reinstated.

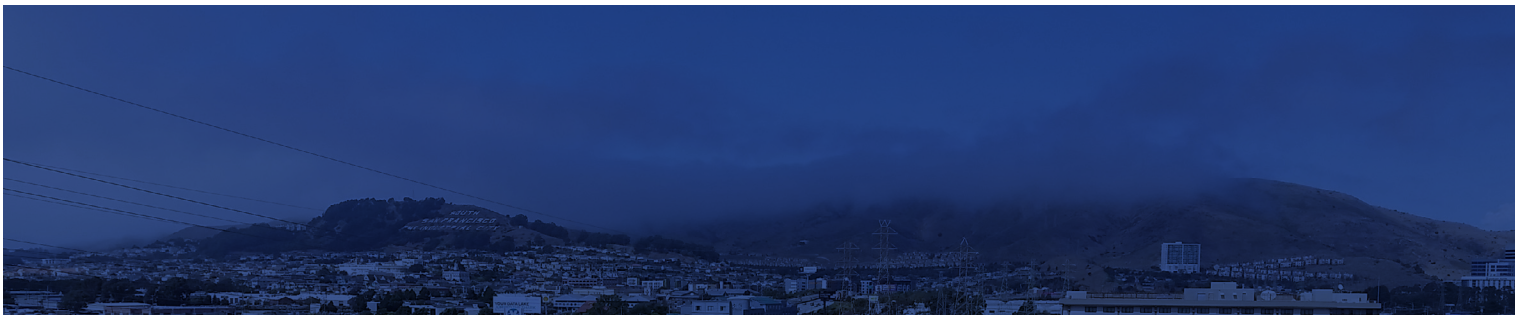
Colma Creek
The City convenes the Colma Creek Advisory committee to guide revitalization and flood mitigation efforts. It also hosts clean up events to improve the creek's ecosystems.

Orange Memorial Park Stormwater Capture Project
In 2018, the City began a stormwater capture and cleaning project managed by the Department of Public Works that will provide reclaimed water for reuse in parks and water quality benefits to the community.

South San Francisco Community Garden
Established in 1984 to provide residents with the opportunity to grow their own food, cultivate community cohesion, and enhance overall wellbeing.

Wastewater Treatment Plant
Anerobic digesters at the City's water quality control plant generate renewable biogas that is used to power the plant's 400 kilowatt (kW) generator, significantly offsetting operational energy use and purchases.

Free South City Shuttle
The City began this program in 2014, which provides free transportation to local stores, libraries, schools, downtown, senior centers, and parks in South San Francisco. It is also a connector to other modes of transportation including SamTrans and BART, leading to reduced traffic congestion.



CHAPTER 3

Greenhouse Gas Emissions in South San Francisco

Centennial Way Trail

This chapter summarizes the methodology for accounting 2017 GHG emissions from community activities as well as backcasting to 1990 emissions levels. The 2017 inventory serves as the foundation for projecting emission trends and informing measures and actions that the City needs to implement to achieve carbon neutrality by 2045. The City conducted its first inventory in 2005. See Appendix A for the full 2017 inventory report. Note that the numbers in the 2017 report may differ from the CAP as a result of the CAP using the more recent best available data.

3.1 2017 COMMUNITY GREENHOUSE GAS INVENTORY

The 2017 City of South San Francisco greenhouse gas emissions inventory captures communitywide emissions generated from transportation, energy consumption in homes and buildings, solid waste, water, and off-road transportation (e.g., emissions from construction, landscaping equipment) within the city. It was developed using the ICELI Global Protocol for Community-Scale Greenhouse Gas Emission Inventories. Additionally, in order to be consistent with the City's 2014 CAP, 2005 emissions are used as a proxy for the estimated 1990 level of emissions.[8]

The 2017 total community emissions were 609,452 metric tons of carbon dioxide equivalent (MTCO2e), an increase of 91,695 MTCO2e from 2005. This inventory is an estimate based on the best available data. As in 2005, transportation was the largest contributor to total GHG emissions with an estimated 268,787 MTCO2e or 44% of the City's total 2017 emissions. Nonresidential energy was the second largest sector with estimated emissions of 193,910 MTCO2e or 32% of emissions.

Although the second largest contributor to emissions, nonresidential energy emissions are likely an underestimate due to incomplete data caused by customer data aggregation laws. The remaining 24% of emissions include residential energy, solid waste, water, and off-road transportation (see Table 1). Figure 2 depicts the proportion of emissions by sector for 2017.

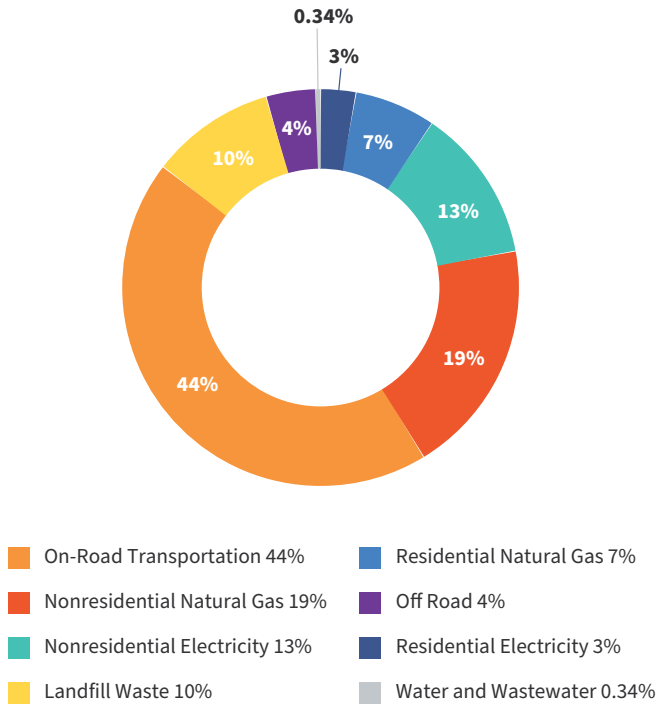
8. *ICLEI. (2010). Quick State Guide for Setting a Greenhouse Gas Reduction Target.*
Note: Methodology is consistent with quantification guidance provided by ICLEI.

Table 1: Total Annual Community GHG Emissions (2017)

Community Sector	Subsector	Subsector MTCO2e	Sector MTCO2e	Percent of Total
Transportation	On-Road Transportation	268,222	268,787	44%
	BART	157		
	CalTrain	407		
Nonresidential Energy	Electricity	119,700	193,910	32%
	Natural Gas	42,310		
Residential Energy	Electricity	17,500	57,870	9%
	Natural Gas	40,370		
Solid Waste	Landfilled Waste	48,623	61,854	10%
	Closed Landfill	13,231		
Water	Water Use	2,092	2,092	0.3%
Off-Road	Lawn and Garden Equipment	1,180	24,940	4%
	Construction Equipment	23,760		
Total			**609,452**	**100%**

Source: South San Francisco community GHG emissions inventory (2020)

Figure 2: 2017 Community GHG Emissions by Sector



Source: South San Francisco community GHG emissions inventory (2020)

Community-wide, the City of South San Francisco emitted 609,452 MTCO2e in 2017, up 18% from the 2005 greenhouse gas emissions estimate of 517,757 MTCO2e. Despite an 18% increase in overall emissions, annual per service population emissions only increased from 2005 to 2017 by 3% from 4.8 MTCO2e in 2005 to 4.94 MTCO2e in 2017. The service area population is a sum of the populations that live and/or work in the city (population and jobs). These numbers show that population, job growth, and a strong regional economy are the primary drivers of emission increases and that emissions reduction strategies in the 2014 CAP were not able to keep up with growth.

3.2 GREENHOUSE GAS EMISSIONS FORECAST

Two emissions forecasts were prepared to estimate South San Francisco's emissions from 2020-2040 as presented in Table 2. These forecasts show the emissions reductions the CAP actions will need to achieve to become carbon neutral by 2045.

Business-As-Usual (BAU):
The BAU scenario projects future emissions based on current population and regional growth trends, climate patterns and their impacts on energy use, and regulations (Federal, State, and local) introduced before the 2017 inventory year. BAU projections demonstrate the expected growth in GHG emissions if no further action is taken by the State or at the local level after 2017. Under this "do nothing" scenario, the City's emissions are estimated to increase by 96% by 2040.

Adjusted Business-as-Usual (ABAU):
The ABAU forecast shows how South San Francisco's emissions are anticipated to change accounting for the impacts of adopted State climate-related policies if no action is taken at the local level. Based on the results of the ABAU forecast, emissions are expected to increase by 40% by 2040.

Electric Vehicle Fast Chargers

Table 2: Community Forecast 2020-1040 in MTCO2e

	2020	2025	2030	2035	2040
BAU	636,007	755,941	875,877	961,915	1,191,518
ABAU	612,412	649,113	685,814	705,340	851,550

Source: South San Francisco community GHG emissions inventory (2020)

Bike Lane in East of 101 Sub-Area

3.3 GREENHOUSE GAS REDUCTION TARGETS

The bold targets set forth in this plan demonstrate South San Francisco's commitment to mitigating climate change and the adverse impacts it causes.

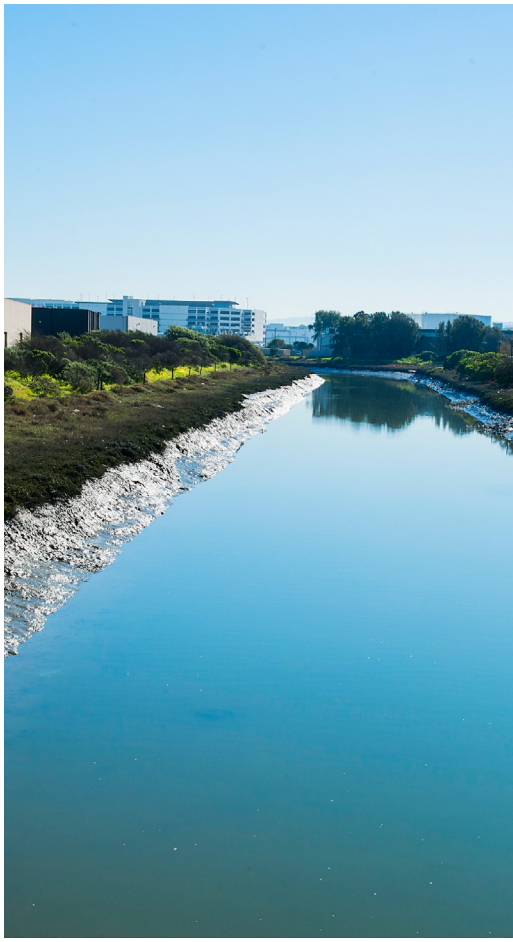
South San Francisco has set the following GHG reduction targets:

- 40% below 1990 levels by 2030 (SB 32)
- 80% reduction by 2040 (Interim)
- Carbon neutrality by 2045 (EO B-55-18)

This CAP includes innovative strategies and actions to significantly reduce greenhouse gas emissions into the future—but technological constraints may prevent reducing emissions to absolute zero by 2045. As a result, to achieve carbon neutrality, the City may need to offset remaining tons of GHGs emitted with an equivalent amount of GHGs removed through a combination of nature-based solutions, carbon capture technology, and other carbon offset options.

Wetland Cleanup

Tree Planting



Colma Creek

CHAPTER 4

Greenhouse Gas Reduction Strategies

Person Installing Solar Panels

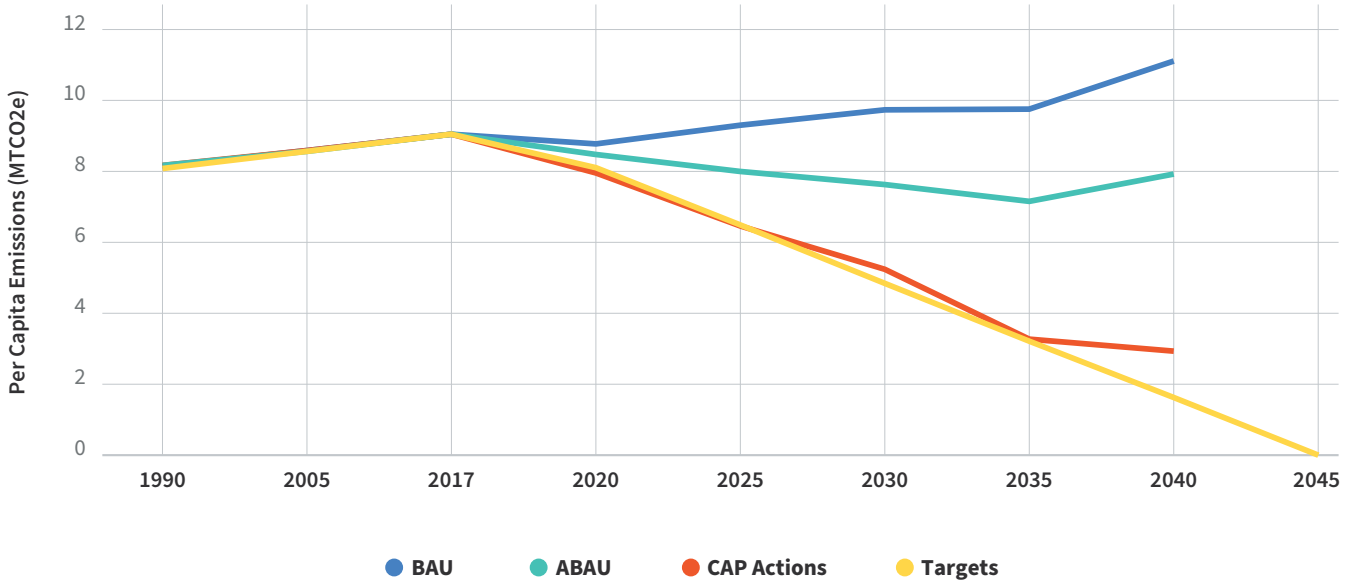
One of the primary objectives of this CAP is to identify pathways for reducing local GHG emissions from the City of South San Francisco. This chapter summarizes the mitigation measures and sub-actions that the City needs to implement to achieve carbon neutrality by 2045.

4.1 GREENHOUSE GAS EMISSIONS REDUCTION PATHWAY

As illustrated in Figure 3 on the following page, the City will need to proactively take local climate action to reduce and offset greenhouse gas emissions to achieve GHG reduction targets. State and regional policies and regulations are projected to reduce 2040 business-as-usual (BAU) emissions by 39%. Implementing these measures can put the City on path to achieving the SB 32 goal of a 40% reduction in mass emissions by 2030 and the interim goal of 80% reduction by 2040.

The following strategies achieve a 9% mass emissions reduction compared to 1990 levels in 2030 and a 63% reduction in 2040. On a per capita basis, implementing these measures does achieve a 69% reduction in emissions by 2030, which emphasizes the importance of pairing climate mitigation measures with growth in order to counteract the adverse effects on the environment. However, additional action will be needed to close the gap of 315,869 MTCO2e to achieve carbon neutrality by 2045. See Appendix C for more detailed emissions reduction estimates.

Figure 3: Emissions Reductions from CAP Actions



Source: R+A CAP and GPU Technical Analysis (2022)

Note:

- Business-As-Usual (BAU): An estimate of how emissions would grow over time without any climate action.
- Adjusted Business-as-Usual (ABAU): The influence of federal, statewide, and regional policies (e.g., Pavley Clean Car Standards) will have on the City's projected emissions.
- CAP Actions: The estimated collective impact of the actions identified in this CAP.

The strategies and actions in this Plan reflect South San Francisco's unique context and role in taking climate action. Considerations include:

Progressive state and regional activities

California has introduced ambitious climate policies and regulations, as well as tools and resources for supporting local climate action. South San Francisco's strategies align with other California cities—setting ambitious emissions reduction targets and leading the nation in local climate action planning.

Bay Area Biotech hub

South San Francisco is home to a biotech cluster with specific energy and personnel needs. This plan focuses on sustainable solutions for energy use and transportation that still allows for future growth of the sector.

The Industrial City

South San Francisco has legacy industrial commercial uses. The CAP accommodates these businesses while proposing alternative energy sources and waste mitigation strategies.

Workforce housing

South San Francisco has long been a relatively affordable community in the Bay Area that also offers easy access to the region's most significant job centers. Much of the city's housing stock was originally built to accommodate the workforce for the city's factories and warehouses. This relatively modest workforce housing has continued to support middle income households over the decades.

A community concerned about equity

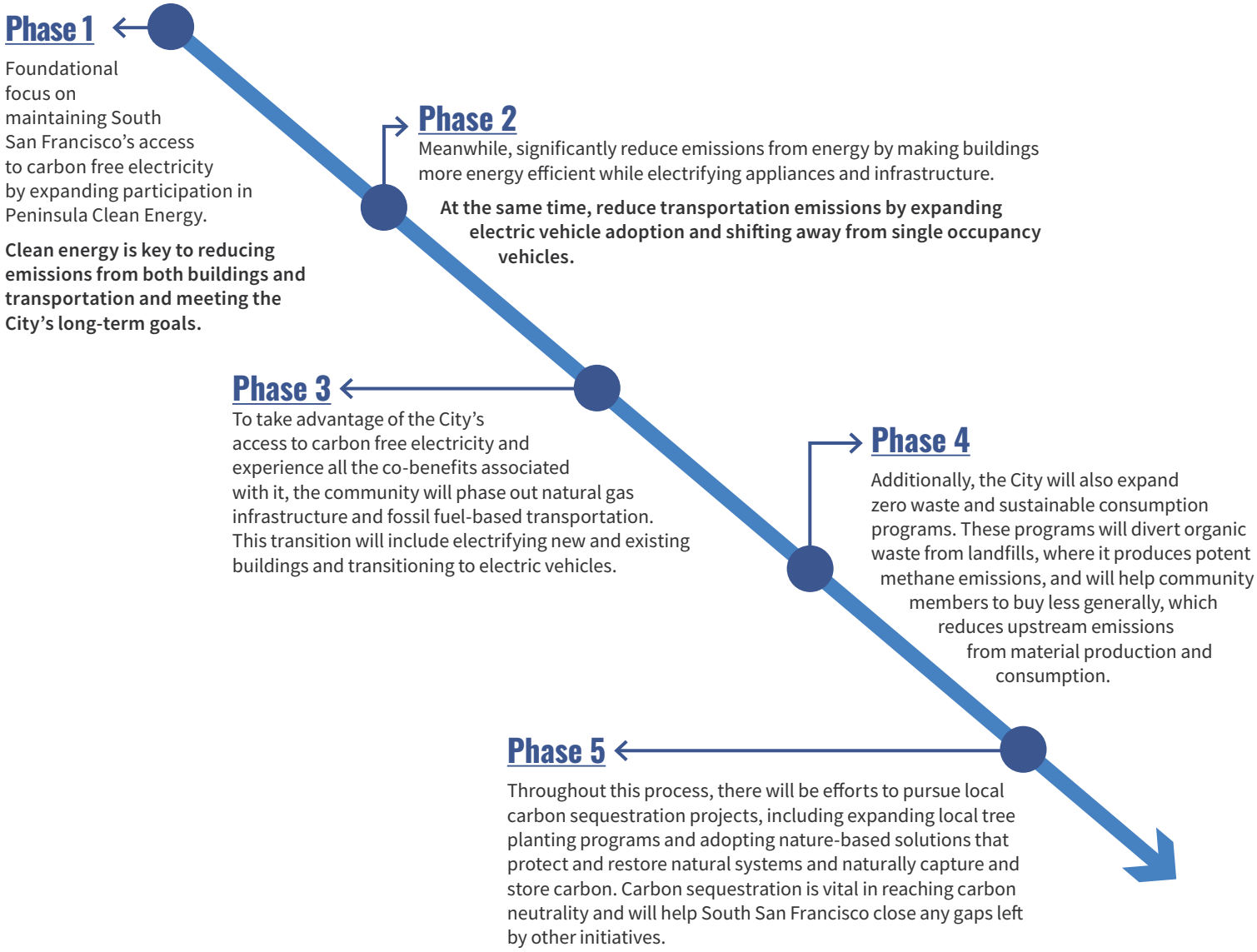
It is important to ensure that climate benefits are experienced equitably for all populations and geographic regions of the city. Implementation of policies will focus on community members most impacted by climate change and pollutants, as identified in the General Plan Update process, including those living and working in the sub-areas of Orange Park, Downtown, Sign Hill, Paradise Valley/Terrabay, El Camino Real, Lindenville, and East of 101.

The following strategies and actions collectively work toward achieving the near team goal of 40% reduction in greenhouse gas emissions by 2030 and carbon neutrality by 2045.

4.2 REDUCTION APPROACH

South San Francisco will work to achieve carbon neutrality by 2045 and an 80% reduction of emissions by 2040 by building upon the progress the City has already made and adopting new emissions reduction strategies and actions. Together, these strategies and actions: (1) provide a framework for reaching carbon neutrality; (2) make South San Francisco more resilient to future climate impacts; and (3) have important social and economic benefits, such as addressing historic inequities, creating green jobs, increasing community green spaces, and improving public health. Figure 4 outlines the City's five step approach to reducing community GHG emissions.

Figure 4: Approach to Reduce Greenhouse Gas Emissions



4.3 PRIORITY STRATEGIES AND ACTIONS

Through an extensive community engagement process, the initial longlist of strategies and actions were prioritized based on their greenhouse reduction potential, co-benefits, and financial resources. These priority actions lay the foundation for future action, contribute to the elimination of greenhouse gas emissions by 2045, and make South San Francisco more resilient, especially those most at-risk and vulnerable to impacts of climate change.

Table 3: Priority Strategies and Actions

Number	Strategy
BNC 2.1	**All-Electric Reach Code for Nonresidential New Construction.** Implement residential all-electric reach code and adopt all-electric reach code for nonresidential new construction.
BE 1.3	**Energy Efficiency Programs.** Update zoning and building codes to require alternations or additions at least 50% the size of the original building to comply with minimum CALGreen requirements.
BE 2.1	**Existing Building Electrification Plan.** Develop a date certain, phased-in Existing Building Electrification Plan to retrofit 90% of existing homes and businesses to all electric by 2040.
BE 2.3	**Burnout Ordinance.** Require gas appliances (stove, clothes dryer, water heater) to be replaced with an electric alternative when they fail or reach the end of their useful life.
BE 2.4	**All-Electric Major Renovations.** Adopt an all-electric reach code for major renovations, alterations, additions.
TL 2.2	**TDM Program.** Implement, monitor, and enforce compliance with the City's TDM Ordinance.
TL 2.6	**Complete Streets Policy.** Ensure that all roadway and development projects are designed and evaluated to meet the needs of all street users, and that development projects contribute to multimodal improvements in proportion to their potential impacts on vehicle miles traveled. Incorporate bicycle and pedestrian improvements identified in the Active South City Plan.
TL 2.8	**Transit Station Access.** Leverage public-private partnerships to increase transit ridership and improve transit station access by incorporating first/last mile bus, shuttle, and active transportation connections between employment hubs and regional transit stations.
TL 2.9	**Transit Service Levels.** Continue collaboration with Caltrain, SamTrans, WETA, and shuttle providers to scale service levels in growing areas and leverage private sector subsidies of transit fares to support BART, Caltrain, SamTrans, and WETA ridership.
CL 2.6	**Community Education about Greenhouse Gas Reduction Incentives.** Educate residents and businesses about opportunities to reduce greenhouse gas emissions through grant funding, rebates, and other incentive opportunities.

4.4 REDUCTION STRATEGIES AND ACTIONS

In order to mitigate greenhouse gas emissions and adapt to a changing climate, the City intends to move forward with 62 mitigation actions organized into seven categories. Implementing these actions will put South San Francisco on the path to carbon neutrality by 2045. This section presents the mitigation measures and their GHG emission reduction potential, co-benefits, implementation costs, and lead City department.

GHG Reductions Key:

Supportive—no direct emissions reductions but aid the implementation of measures with direct emissions reductions.

Low—less than 15,000 MTCO2e

Medium—16,000–40,000 MTCO2e

High—more than 40,000 MTCO2e

Bee Hives

Electric Vehicle Charging

Cost Key:

$—less than $100,000

$$—$100,000–$500,000

$$$—$500,000–$2,500,000

$$$$—over $2,500,000

Clean Energy

INTENT:
A resilient and fossil-free energy system to reduce energy related greenhouse gas emissions as well as improve local air quality and public health.

Residential and nonresidential energy use, including electricity and natural gas, account for 41% of South San Francisco's greenhouse gas emissions.[9] These emissions are mainly driven by the burning of fossil fuel natural gas, which accounts for 60% of energy-related emissions in the city. The proportion of natural gas to overall energy use is expected to increase because the City has joined Peninsula Clean Energy (PCE), which supplies 100% carbon-free electricity to its customers. As of 2020, the community wide participation rate in PCE is 96%. Clean grid electricity, including the installation of distributed energy resources (DERs) such as local solar projects, is a keystone effort being led by the State to achieve its climate goals. Senate Bill 100's renewable portfolio standard will require that supplied energy not only be 100% carbon-free by 2045 but also 100% generated from renewable sources like wind, solar, and local biogas.

Additionally, having access to clean electricity makes supporting the transition to electric vehicles across South San Francisco more beneficial. Although transportation demand policies are addressed in the Mobility and Access Element of the General Plan, transportation is the largest contributor to community emissions accounting for 44% of total emissions. Transportation is also projected to account for most emissions in 2040. To date, the City has adopted an Electric Vehicle Master Plan and is installing electric vehicle charging stations in public parking facilities. The City also provides alternative transportation choices, including the Free South City Shuttle, and is currently developing an active transportation plan to encourage walking and biking.

Performance Metrics

- Participation rate in PCE ECOPlus tier and ECO100 tiers
- Number of (or size of) solar installations on commercial buildings
- Number of battery storage systems installed

Local Solar Installation Actions

- CE 1.1 Solar reach code for nonresidential buildings
- CE 1.2 Streamlined approval process for battery storage systems
- CE 1.3 Streamlined photovoltaic (PV) system permitting and approval
- CE 1.4 Energy resilience via back-up energy systems, microgrids, and other measures
- CE 1.5 Public Safety Power Shutoffs
- CE 1.6 Community scale solar and other renewable energy

Carbon-Free Electricity Actions

- CE 2.1 Peninsula Clean Energy Membership

9. *Raimi + Associates. (2021). South San Francisco 2017 Greenhouse Gas Inventory.*

1. LOCAL SOLAR INSTALLATION ACTIONS

CE 1.1 Adopt solar reach code for nonresidential buildings

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Supportive	$	Resilience	City Manager, Building

Require the construction of any new nonresidential conditioned space of 5,000 square feet or more, or the conversion of unconditioned space 5,000 square feet or more, to meet a minimum of 50% of modeled building electricity needs with on-site renewable energy sources, as is feasible. To calculate 50% of building electricity needs for the new conditioned space, the applicant shall calculate building electricity use as part of the Title 24 compliance process. Total electricity use shall include total use for the new conditioned space excluding process energy.

CE 1.2 Streamline permitting and approval processes for battery storage systems

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Supportive	$	Resilience	City Manager, Building

Establish a streamlined approval process for battery storage systems and reduce or eliminate permitting fees to encourage the addition of battery storage.

CE 1.3 Streamline PV system permitting and approval

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Supportive	$	Resilience	City Manager, Building

Establish a streamlined PV system permitting and approval process to encourage the addition of solar PV systems.

CE 1.4 Develop a program to provide energy resilience via back-up energy systems, microgrids, and other measures

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Low	$$-$$$	Resilience	Public Works

Provide energy resilience via back-up energy systems, microgrids, and other measures that serve the community during emergency events, particularly supporting disadvantaged communities, including considering creating a financial incentive program for existing and new solar/battery backup system installations.

CE 1.5 Work with PG&E to minimize the impacts of Public Safety Power Shutoffs

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Supportive	$	Resilience	City Manager, Public Works

Work with PG&E to minimize the impacts of Public Safety Power Shutoffs and to prevent utility shutoff during extreme heat events.

CE 1.6 Explore community scale solar and other renewable energy implementation

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Supportive	$-$$$	Resilience	Public Works

Explore the opportunities to install community scale solar PV or other renewable energy systems including biogas to support local energy resiliency and provide renewable energy to disadvantaged communities.

2. CARBON FREE ELECTRICITY ACTION

CE 2.1 Achieve and maintain 95% participation in PCE 100% RE tier

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
High	$		City Manager

Maintain City membership in Peninsula Clean Energy (PCE) and continue to work to maintain a minimum of 95% of private property owner participation in PCE.

2040 Clean Energy GHG Reduction Potential	Supportive
Cost	**$-$$$**

Aerial of East of 101
Source: "Aerial View of Coastline, East of 101" by Chiara Coetzee

Built Environment

Buildings are the primary users of energy within the city and the main vehicle to reduce energy-related emissions. Electricity use in residential and nonresidential buildings accounts for 16% of community emissions and natural gas use accounts for 26% of community emissions. There are two main approaches to reduce emissions in buildings.

The first is improved energy efficiency of new and existing buildings and the second is through the electrification of buildings. Electrification removes natural gas systems from buildings and uses electric alternatives to take advantage of the 100% carbon-free electricity provided by PCE.

New Construction

INTENT:

Green buildings are the standard in South San Francisco for new construction and major renovations.

The number of employees and residents in South San Francisco is expected to grow through 2040, and this growth will result in the construction of new residential and commercial buildings. New construction is governed by the California Building Code and must meet the California Green Building Standards (CALGreen), which include requirements for energy performance. The building code is updated every three years to reflect industry best practices and increase the sustainability of new construction. However, to avoid developing GHG-emitting buildings and infrastructure with useful lives beyond the City's emissions reduction goals, the City will make enhanced green building the standard for all new construction and major remodels in SSF. Going beyond CALGreen includes promoting all-electric new construction for both residential and nonresidential buildings by adopting a reach code.

Performance Metrics

- Number of all-electric new development projects
- Citywide natural gas use
- Number of new development projects that exceed CALGreen energy efficiency standards

Improved Energy Efficiency of New Construction Action

- BNC 1.1 Energy Efficient New Construction

All-Electric New Construction Action

- BNC 2.1 Nonresidential All-Electric New Construction

1. IMPROVED ENERGY EFFICIENCY OF NEW CONSTRUCTION			
BNC 1.1 Improve the energy efficiency of new construction			
GHG Reduction Potential	**Cost**	**Co-Benefits**	**Responsible Department**
Medium	$	Resilience, air quality, public health	Planning
Provide a combination of financial and development process incentives (eg. expedited permitting, FAR increases, etc.) to encourage new development to exceed Title 24 energy efficiency standard			

2. ALL-ELECTRIC NEW CONSTRUCTION			
BNC 2.1 Adopt an all-electric reach code for nonresidential new construction			
GHG Reduction Potential	**Cost**	**Co-Benefits**	**Responsible Department**
Medium	$	Resilience, air quality, public health	City Manager, Building
Implement residential all-electric reach code and adopt all-electric reach code for nonresidential new construction. Exempt occupancies must install electric building systems (e.g. space and water heating equipment) where feasible. Until the adoption of the nonresidential all-electric reach code, require any new nonresidential conditioned space of 5,000 square feet or more, or the conversion of unconditioned space 5,000 square feet or more to comply with CALGreen Tier 2 energy efficiency requirements to exceed mandatory energy efficiency requirements by 20% or more. For additions to existing development of 5,000 square feet or more, CALGreen Tier 2 shall be calculated as part of the Title 24 compliance process. Existing building space already permitted shall not be subject to CALGreen Tier 2 requirements.			
2040 New Construction GHG Reduction Potential			**4,900 MTCO2e**
Cost			**$**

Existing Buildings

INTENT:

The performance of existing buildings in South San Francisco is improved and decarbonized.

Most building-related emissions are attributable to the existing building stock, which is much less efficient than new construction due to being built when building energy standards were nonexistent. Decarbonizing existing buildings is critical to meeting emissions reduction goals. There are many challenges associated with improving the performance of existing buildings including costs, rental/ownership status and split incentives, and technological constraints. However, benefits include healthier indoor air quality, reduced energy use and lower utility bills, and more resilient building systems. Improving existing buildings in South San Francisco will focus on equitable electrification and promoting existing energy efficiency programs offered by utility companies. Equitable electrification achieves building decarbonization, promotes affordable housing and anti-displacement, equal access to health and safety benefits, economic benefits, and maximizes the ease of installation for everyone, but focuses resources for underserved communities.

Performance Metrics

- Number of electric panel upgrades
- Number of building electrification retrofits
- Number and type of retrofits in disadvantaged communities
- Citywide natural gas use

Improved Energy Efficiency of Existing Buildings Actions

- BE 1.1 EPA Home Energy Score
- BE 1.2 CALGreen standards for major renovations
- BE 1.3 Energy Efficiency Programs
- BE 1.4 Low-Cost Energy Audits
- BE 1.5 Deep Energy Retrofits
- BE 1.6 Commercial Benchmarking Ordinance
- BE 1.7 Retrocommissioning Partnership
- BE 1.8 Transition to carbon-free back-up power

Electrify Existing Buildings Actions

- BE 2.1 Existing Building Electrification Plan
- BE 2.2 Electric Panel Upgrade
- BE 2.3 Burnout Ordinance
- BE 2.4 All-Electric Major Renovations

1. IMPROVED ENERGY EFFICIENCY

BE 1.1 EPA Home Energy Score

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Supportive	$		Economic and Community Development

Encourage residential properties older than 10 years to provide an energy audit or EPA Home Energy Score at time of sale.

BE 1.2 Require major renovations to meet CALGreen standards

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Medium	$$	Lower utility costs, indoor air quality	Planning, Building

Update zoning and building codes to require alternations or additions at least 50% the size of the original building to comply with minimum CALGreen requirements.

BE 1.3 Energy efficiency programs

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Medium	$	Lower utility costs	City Manager
Promote rebate programs for household appliances including those from Bay Area Air Quality Management District (BAAQMD).			

BE 1.4 Low-cost energy audits

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Low	$		City Manager
Work with Peninsula Clean Energy and San Mateo County Energy Upgrade to provide free to low-cost energy audits.			

BE 1.5 Deep energy retrofits

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Medium	$$	Lower utility costs, indoor air quality	City Manager
Work with PG&E and PCE to implement deep retrofits in the existing building stock, focusing resources in the most disadvantaged communities.			

BE 1.6 Commercial Benchmarking Ordinance

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Supportive	$	Lower utility costs	City Manager, Building
Adopt energy and water benchmarking ordinance for commercial buildings over 10,000 square feet to empower owners to control utility costs.			

BE 1.7 Retrocommissioning partnership

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Low	$	Lower utility costs	City Manager, Building
Work with PG&E and PCE to implement retrocommissioning in the existing building stock.			

BE 1.8 Transition to carbon-free back-up power

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Low	$	Air quality, resilience	City Manager
Work with PG&E and PCE to transition backup generators from diesel to carbon-free sources including battery storage systems.			

2. ELECTRIFY EXISTING BUILDINGS BY 2040

BE 2.1 Existing Building Electrification Plan

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
High	$$	Resilience, air quality, public health	City Manager, Building
Develop a date certain, phased-in Existing Building Electrification Plan to retrofit 90% of existing homes and businesses to all electric by 2040.			

BE 2.2 Electric Panel Upgrade

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Supportive	$	Air quality, public health	City Manager, Building
Require electric panel upgrades upon sale and/or rental turnover for single family and low-rise residential.			

BE 2.3 Burnout Ordinance

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Medium	$$	Resilience, air quality, public health	City Manager, Building
Require gas appliances (stove, clothes dryer, water heater) to be replaced with an electric alternative when they fail or reach the end of their useful life.			

BE 2.4 All-electric major renovations

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Medium	$$	Resilience, air quality, public health	City Manager, Building
Adopt an all-electric reach code for major renovations, alterations, additions.			
2040 Built Environment GHG Reduction Potential			**235,450 MTCO2e**
Cost			**$-$$**

Transportation and Land Use

INTENT:
Transportation in South San Francisco will be safe, multimodal, sustainable, livable, and connected.

Transportation-related emissions are the largest contributor to communitywide emissions, accounting for 44%. There are two main levers to reduce emissions associated with transportation. The first is to "clean" vehicle miles traveled (VMT) through vehicle electrification and access to carbon-free electricity from PCE. Second, is to reduce VMT through transportation demand programs and policies. Vehicle electrification can result in immediate emissions reductions as a result of using the carbon-free electricity available in the city. However, EV adoption is not directly within the City's control. Transportation demand measures (TDMs) to reduce VMT, on the other hand, take longer to implement but can generate many co-benefits in addition to reducing GHG emissions. VMT reduction strategies align with the General Plan Mobility and Access Element target that aims for transit, walk, and bike trips to account for 40% of all trips by 2040.

Performance Metrics

- Transit, walk, and bike trips account for 40% of all trips
- Double SamTrans and BART ridership, quadruple ferry ridership, and achieve 10x growth in Caltrain ridership by 2040
- Reduction in East of 101 Area peak hour traffic volumes

Clean VMT through Electrification

- TL 1.1 Electric Vehicle Charging Reach Code
- TL 1.2 Electric Vehicle Chargers at Municipal Facilities

Reduced VMT through Mode Shift

- TL 2.1 Trip CAP on East of 101
- TL 2.2 TDM Program
- TL 2.3 Improve Curb Management
- TL 2.4 Parking Demand Management Strategy
- TL 2.5 Development along Transit Corridors
- TL 2.6 Complete Streets Policy
- TL 2.7 Free Local Bus Service
- TL 2.8 Transit Station Access
- TL 2.9 Transit Service Levels

1. CLEAN VMT THROUGH ELECTRIFICATION

TL 1.1 Electric Vehicle Charging Reach Code

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Medium	$	Air quality, public health	Planning, Building
Implement EV reach code.			

TL 1.2 Electric Vehicle Chargers at Municipal Facilities

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Medium	$$	Air quality, public health	Public Works, City Manager
Seek opportunities to install additional electric vehicle chargers at suitable public facilities, including Downtown parking structures and community and regional parks.			

2. REDUCED VMT THROUGH MODE SHIFT

TL 2.1 Trip CAP on East of 101

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Medium	$	Air quality, public health, reduced congestion	Planning

Implement an East of 101 area trip cap with triennial monitoring and corrective actions if exceeded to manage the number of vehicles entering the area.

TL 2.2 TDM Program

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Medium	$	Air quality, public health, reduced congestion	Planning

Implement, monitor, and enforce compliance with the City's TDM Ordinance.

TL 2.3 Improve Curb Management

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Supportive	$$	Reduced congestion	Planning, Public Works

Evaluate the current and best use of curb space in the city's activity centers and repurpose space to maximize people served (i.e. for loading, bikeways, bike parking, bus lanes, EV charging, or parklets).

TL 2.4 Parking Demand Management Strategy

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Supportive	$	Air quality, public health, reduced congestion	Planning

Incorporate maximum parking requirements for new residential and office/R&D projects.

TL 2.5 Development along Transit Corridors

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Medium	$	Air quality, public health, reduced congestion	Planning

For all new land use and transportation projects, adhere to the City's VMT Analysis Guidelines and qualitatively assess the project's effect on multimodal access. Use the development review process to identify opportunities to enhance bicycle, pedestrian, and transit connectivity.

TL 2.6 Complete Streets Policy

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Medium	$$	Air quality, public health, reduced congestion, safety	Planning, Public Works

Ensure that all roadway and development projects are designed and evaluated to meet the needs of all street users, and that development projects contribute to multimodal improvements in proportion to their potential impacts on vehicle miles traveled. Develop a Capital Improvement Program (CIP) prioritization criteria, including equity considerations for SB 1000 neighborhoods, to strategically advance multimodal complete streets projects. All capital improvements and development projects incorporate bicycle and pedestrian improvements identified in the Active South City Plan, such as trails, bikeways, bicycle detection at traffic signals, high-visibility crosswalks, and pedestrian-oriented site plans.

TL 2.7 Free Local Bus Service

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Low	$$	Resilience, air quality, public health	City Manager, Public Works

Develop a dedicated funding source or leverage private sector contributions to fund the South City shuttle and free bus service for South City residents.

TL 2.8 Improve Transit Station Access

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Low	$$	Resilience, air quality, public health	Planning, Public Works

Leverage public-private partnerships to increase transit ridership and improve transit station access by incorporating first/last mile bus, shuttle, and active transportation connections between employment hubs and regional transit stations.

TL 2.9 Scale Transit Service Levels

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Low	$	Resilience, air quality, public health	City Manager, Planning

Continue collaboration with Caltrain, SamTrans, WETA, and shuttle providers to scale service levels in growing areas and leverage private sector subsidies of transit fares to support BART, Caltrain, SamTrans, and WETA ridership.

2040 Transportation GHG Reduction Potential	**220,820 MTCO2e**
Cost	**$-$$**

Solid Waste

INTENT:
The City continues to divert organics from landfill in accordance with State targets, meeting the requirements of SB 1383 Short-Lived Climate Pollutants Act and reducing greenhouse gas emissions related to landfilled waste as well as cultivating behavior change around resource consumption.

Solid waste accounts for 10% of South San Francisco's overall emissions. By consuming less materials and recycling and composting more, the community will be able to reduce the amount of waste sent to landfill and eventually become a zero-waste city. Specifically, diverting organic material including food waste is a crucial step to meeting long-term goals, because organic materials produce methane, which is a more potent GHG than carbon dioxide. The State adopted Senate Bill 1383, the Short-Lived Climate Pollutants Act, that requires jurisdictions to divert 75% of food waste from landfills by 2025, and jurisdictions must also recover food waste that can be repurposed. Moreover, organics recycling can provide useful byproducts including compost and biogas, which can further reduce emissions and provide economic benefits.

Performance Metrics

- Communitywide waste generation
- Tons of edible food recovered and redistributed

Increase diversion from landfill

- SW 1.1 Zero-Waste Plan
- SW 1.2 SSF Scavenger Partnership
- SW 1.3 Waste Reduction Compliance Pathways
- SW 1.4 Educational outreach about waste diversion
- SW 1.5 Waste rate structures
- SW 1.6 City green purchasing program

1. INCREASED DIVERSION FROM LANDFILL

SW 1.1 Zero-Waste Plan

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Low	$$		Public Works

Adopt an SB 1383 compliant zero-waste plan for municipal operations and the community that includes: mandatory residential and commercial recycling and collection of organics/food waste, mandatory commercial edible food recovery program (per MOU with San Mateo County Office of Sustainability), and updated trash enclosure space and access requirements based on hauler recommendations to accommodate all waste streams (e.g., recycling, trash, and organics).

SW 1.2 SSF Scavenger Partnership

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Low	$		Public Works

Continue to work with SSF Scavenger to ensure implementation of waste reduction targets.

SW 1.3 Waste Reduction Compliance Pathways

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Low	$		Public Works

Establish compliance pathways and enforcement mechanisms for mandatory organics and food waste diversion.

SW 1.4 Educational outreach about waste diversion

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Supportive	$$		Public Works
Develop education and technical assistance programs to help all residents and businesses to compost and recycle. Work with the school district on educational and pilot programs.			

SW 1.5 Waste rate structures

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Low	$$		Public Works
Explore modifying waste rate structures to encourage efficiency in future franchise agreements.			

SW 1.6 City green purchasing program

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Low	$		Public Works, Finance
Establish a green purchasing program for City of South San Francisco municipal operations.			
2040 Built Environment GHG Reduction Potential			**12,840 MTCO2e**
Cost			**$-$$**

Compost, Recyclable, and Landfill Waste Receptacle

Water and Wastewater

INTENT:
Water is used efficiently in South San Francisco to help ensure a safe and resilient water supply.

Water is a critical resource in California and South San Francisco. Regional water supplies are already being adversely affected by climate change induced drought and decreased snowpack. South San Francisco's water supplier, California Water Service, meets 20% of the city's demand with locally pumped groundwater. Climate change may impact local hydrology and affect natural recharge to the local groundwater aquifers and the quantity of groundwater that could be pumped sustainably over the long-term. Lower rainfall and/or more intense runoff, increased evaporative losses, and warmer and shorter winter seasons can alter natural recharge of groundwater.

Although water related emissions in South San Francisco account for less than 1% of the communitywide total emissions, the ecosystem and quality of life benefits that reliable clean water provide are important to protect. Thus, reducing indoor and outdoor water use through fixture upgrades and climate-appropriate landscaping for both residential and nonresidential buildings is incorporated in the General Plan.

Performance Metrics

- Gallons per capita per day (GPCD)
- Number of WELO compliant landscape renovations
- Number of plumbing fixture upgrades

Reduce Outdoor Water Use

- WW 1.1 Landscaping Water Requirements
- WW 1.2 Alternative Water Sources
- WW 1.3 Greywater Systems
- WW 1.4 Landscaping Plant List
- WW 1.5 Smart Meters

Reduce Indoor Water Use

- WW 2.1 Indoor Water Efficiency Standards
- WW 2.2 Water Supplier Rebates

1. REDUCE OUTDOOR WATER USE

WW 1.1 Landscaping Water Requirements

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Low	$	Resilience	Planning, Building, Parks & Recreation

Achieve greater water use reductions than WELO by requiring all landscapes obtain a landscape permit, decreasing the size threshold to capture all landscape renovations, adding prescriptive irrigation plant lists, or water budget requirements.

WW 1.2 Alternative Water Sources

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Low	$	Resilience	Public Works

Explore options at the South San Francisco - San Bruno Water Quality Control Plant for delivering non-potable, recycled water for cooling towers, processes, and irrigation in East of 101 (e.g., flow pipe water). Maximize available non-potable water reuse from Orange Park Stormwater Capture project, at Orange Memorial Park, Centennial Way, and new Civic Campus.

WW 1.3 Promote Greywater Systems

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Low	$	Resilience	Building, Public Works

Create a streamlined permit process for laundry-to-landscape greywater systems.

WW 1.4 Landscaping Plant List

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Supportive	$	Resilience	Parks and Recreation, Planning
Develop a plant list, landscaping palette for efficiency and habitat/wildlife for new development and landscape retrofits.			

WW 1.5 Install Smart Meters

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Low	$	Lower utility costs	Public Works
Partner with CalWater to install smart water meters throughout the city.			

2. REDUCE INDOOR WATER USE

WW 2.1 Indoor Water Efficiency Standards

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Low	$	Lower utility costs	Building
Require high-efficiency fixtures in all new construction and major renovations, comparable to CALGreen Tier 1 or 2 standards.			

WW 2.2 Promote available Rebates

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Supportive	$	Lower utility costs	City Manager, Public Works
Promote available water conservation rebates from BayREN, CalWater, and other sources focusing resources in the most disadvantaged communities.			
2040 Water + Wastewater GHG Reduction Potential			**700 MTCO2e**
Cost			**$**

Drought Tolerant Landscaping

Carbon Sequestration and Natural Systems

INTENT:
The City increases carbon sequestration in public lands, open spaces, and the urban forest through the enhancement of natural systems and provide many quality-of-life and resiliency benefits in addition to emissions reductions.

Carbon sequestration is the long-term removal of carbon dioxide from the atmosphere into the earth's natural systems including trees, grasses, soils, and riparian areas, thereby slowing the accumulation of GHGs in the atmosphere. Since carbon sequestration involves habitats within the city, these topics are further explored as part of the General Plan's Environmental and Cultural Stewardship Element. There are several forms of carbon sequestration, including planting trees, applying compost to open spaces, reusing tree biomass (tree chips) as mulch, and restoring and protecting natural areas such as Colma Creek and Sign Hill. Carbon sequestration through the enhancement of natural systems provides many quality-of-life and resiliency co-benefits in addition to emissions reductions. For example, expanding the urban forest can help mitigate the urban heat island, improve air quality, provide traffic calming, and reduce energy use. Similarly, protecting open space can provide increased opportunities for outdoor recreation and promote biodiversity.

Performance Metrics

- Number of trees planted
- Canopy coverage in disadvantaged communities
- Number of riparian restoration projects completed in Colma Creek watershed

Store Carbon on Protected Lands through Carbon Farming

- CS 1.1 Carbon Farming

Increase Tree Canopy

- CS 2.1 Public Tree Planting
- CS 2.2 Tree Standards for New Development

Restore Colma Creek as an Ecological Corridor

- CS 3.1 Colma Creek Restoration

1. STORE CARBON ON PROTECTED LANDS THROUGH CARBON FARMING

CS 1.1 Carbon Farming

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Low	$	Resilience	Public Works, Parks and Recreation
Explore compost application on available acres of appropriate open space.			

2. INCREASE TREE CANOPY

CS 2.1 Public Tree Planting

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Low	$$	Resilience, air quality, public health	Parks and Recreation
Expand the canopy cover to reach the goals of the Urban Forest Master Plan and increase environmental benefits, prioritizing disadvantaged communities and connected wildlife corridors.			

CS 2.2 Tree Standards for New Development

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Supportive	$	Resilience, air quality, public health	Planning, Parks & Recreation

For nonresidential and residential new construction, require silva cell structures and soil compaction plan for tree growth, and require the preservation and addition of trees on private property in residential neighborhoods through design review where appropriate. Incorporate Parks and Recreation urban forest staff in the review process.

3. RESTORE COLMA CREEK AS AN ECOLOGICAL CORRIDOR

CS 3.1 Colma Creek Restoration

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Low	$$$	Resilience	City Manager, Planning, Public Works

Enhance Colma Creek as an ecological corridor, restoring 5 miles of creek ecologies and creating transitional habitat zones to build resilience and ecosystem services. Protect and expand existing marsh and wetland habitat to improve water quality, adapt to climate change, and provide habitat for wildlife.

2040 Carbon Sequestration GHG Reduction Potential	**3,320 MTCO2e**
Cost	**$-$$$**

Colma Creek in Lindenville

City Leadership

INTENT:
The City demonstrates leadership with high-performing sustainable municipal buildings, facilities, landscaping, and parks.

The ability to meet South San Francisco's goals of mitigating carbon emissions and adapting to the effects of climate change will be demonstrated by City actions. The City will implement a series of actions that will both reduce carbon emissions from municipal operations and enhance resiliency. These actions include energy and water efficiency upgrades for City facilities, parks, and landscapes, sustainable new construction, the electrification of buildings and fleet vehicles, supporting electric vehicle adoption through charger installation, and the installation of resilience measures including solar plus storage projects. These policies will not only reduce emissions but create community benefits through leading by example.

Performance Metrics

- Number City buildings retrofitted to eliminate natural gas use
- Percent of City fleet powered by clean energy
- Reduction in GHG emissions from City operations

Improve the environmental efficiencies and performance of municipal buildings, facilities, landscaping, and parks in South San Francisco

- CL 1.1 Minimum LEED or equivalent for new buildings
- CL 1.2 Environmental performance of municipal buildings and facilities
- CL 1.3 Municipal building retrofits and operational changes
- CL 1.4 Requirements for municipal construction and demolition projects
- CL 1.5 Energy resilience of municipal buildings
- CL 1.6 Zero Emission Fleet Vehicles
- CL 1.7 TDM Program

Maintain and regularly update the City's Climate Action Plan and Greenhouse Gas Inventory with new and emerging practices

- CL 2.1 Carbon neutrality goal monitoring.
- CL 2.2 Community Greenhouse Gas Inventory maintenance
- CL 2.3 Municipal Greenhouse Gas inventory preparation
- CL 2.4 Innovative pilot programs
- CL 2.5 Funding to support greenhouse gas emission reductions
- CL 2.6 Community education about greenhouse gas reduction incentives
- CL 2.7 Advisory Committee for Sustainability

City Building with Solar Panels

1. IMPROVE THE ENVIRONMENTAL EFFICIENCIES AND PERFORMANCE OF MUNICIPAL BUILDINGS, FACILITIES, LANDSCAPING, AND PARKS

CL 1.1 Minimum LEED or equivalent for new buildings

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Low	$$	Air quality, public health, resilience	Public Works, City Manager

Require all new municipal buildings and facilities to meet a minimum LEED silver standards as outlined by the US Green Building Council or equivalent green building rating system. Require feasibility studies for zero net energy use, on-site renewable energy generation, and on-site batteries.

CL 1.2 Environmental performance of municipal buildings and facilities

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Supportive	$	Air quality, public health, resilience	Public Works, Parks and Recreation

Regularly benchmark the environmental performance of municipal buildings, landscaping, parks and facilities, including energy and water use.

CL 1.3 Municipal building retrofits and operational changes

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Low	$		Parks and Recreation

To reduce operating and maintenance costs, use the benchmarking data to identify opportunities for environmental performance improvements through audits, retro-commissioning, and building efficiency and electrification retrofits.

CL 1.4 Requirements for municipal construction and demolition projects

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Low	$		Public Works, City Manager

Require municipal construction projects to achieve 75% waste diversion from the landfill.

CL 1.5 Energy resilience of municipal buildings

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Supportive	$$	Resilience	Public Works, City Manager

Require municipal building and facility new construction and major renovation projects to evaluate the feasibility of incorporating onsite batteries that store electricity from onsite renewable energy generation to supply the building and community with electricity in the event of a disaster.

CL 1.6 Zero Emission Fleet Vehicles

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Low	$$	Air quality, public health	Public Works

Transition fleet vehicles from gasoline and diesel to ZEV (CNG, fuel cell, electric) as feasible ZEV alternatives become available and no later than 2040. Transition City owned and operated small gas engines (eg. push mowers, trimmers, blowers etc) to all-electric by 2024 in line with state mandate.

CL 1.7 TDM Program

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Low	$	Air quality, public health, reduced congestion	City Manager

Adopt municipal TDM policy or participate in City ordinance that encourages alternatives to SOVs and established telecommute policy to allow remote work when feasible.

2. MAINTAIN AND REGULARLY UPDATE THE CITY'S CLIMATE ACTION PLAN AND GREENHOUSE GAS INVENTORY

CL 2.1 Carbon neutrality goal monitoring

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Supportive	$		Planning, City Manager

Track and report progress towards achieving the City's greenhouse gas reduction goal.

CL 2.2 Community Greenhouse Gas Inventory maintenance

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Supportive	$	Resilience, air quality, public health	City Manager

Update the community greenhouse gas inventory every five years.

CL 2.3 Municipal Greenhouse Gas inventory preparation

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Supportive	$	Resilience, air quality, public health	City Manager

Prepare an inventory of emissions from municipal operations, establish a GHG reduction target, and develop a work plan to reduce municipal emissions to achieve carbon neutrality by 2045.

CL 2.4 Innovative pilot programs

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Low	$$	Resilience, air quality, public health, safety	City Manager

Explore the potential for innovative greenhouse gas reduction demonstration and pilot programs, including collaborations and partnerships, in each emissions sector (e.g., buildings and energy, transportation, solid waste, water, and carbon sequestration). Consider showcasing homes, businesses, and projects for educational purposes.

CL 2.5 Funding to support greenhouse gas emission reductions

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Low	$	Resilience, air quality, public health, safety	City Manager

Seek additional sources of funding to support implementation of greenhouse gas reduction projects, exploring grant funding, rebates, tax incentives, and other incentive opportunities.

CL 2.6 Community education about greenhouse gas reduction incentives

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Supportive	$	Resilience, air quality, public health, safety	City Manager

Educate residents and businesses about opportunities to reduce greenhouse gas emissions through grant funding, rebates, and other incentive opportunities. Create bilingual materials and provide tailored materials to homeowners, renters, and landlords at a "one-stop shop" e.g., the Library, and through trusted community members and organizations, including churches and the Promotores program. Establish an environmental interpretative program to raise awareness about environmental issues and climate adaptation throughout the city. Partner with SSFUSD to develop and teach classes on climate change. Develop a green contractor program.

CL 2.7 Advisory Committee for Sustainability

GHG Reduction Potential	Cost	Co-Benefits	Responsible Department
Supportive	$	Resilience	City Manager

Explore development of an advisory committee to receive feedback on climate and sustainability-related programs.

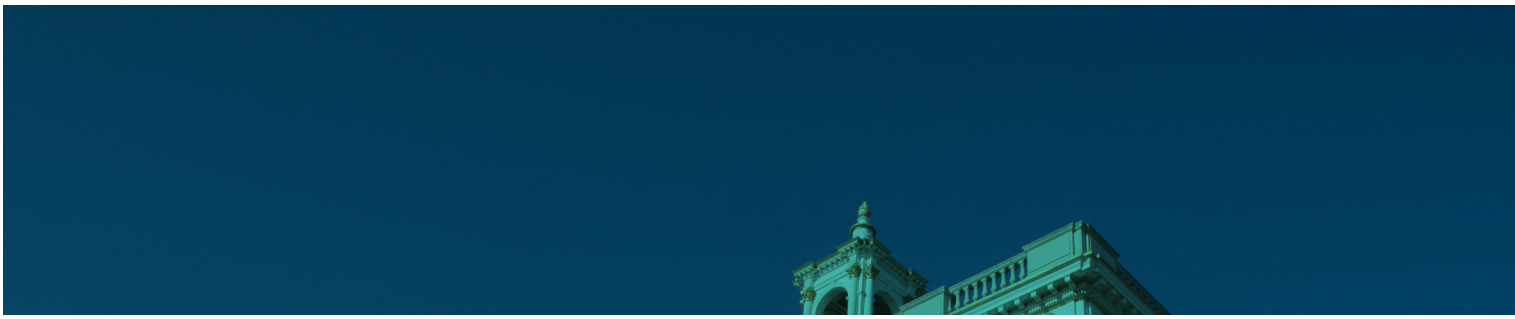
2040 City Leadership GHG Reduction Potential	**Not modeled**
Cost	**$-$$**

City Building with Solar Panels

Performance Metrics

Metric	Available Baseline Data (2017)
Participation rate in PCE ECOPlus tier	96%
Number of (or size of) solar installations on commercial buildings	
Number of battery storage systems installed	
Citywide electricity use	489,460,969 kWh
Citywide natural gas use	29,866,596 therms
Number of all-electric new development projects	
Number of new development projects that exceed CALGreen energy efficiency standards	
Number of electric panel upgrades	
Number of building electrification retrofits	
Number and type of retrofits in disadvantaged communities	
Transit, walk, and bike mode split	Carpool = 29%, transit = 3%, walk and bike = 7%
Double SamTrans and BART ridership, quadruple ferry ridership, and achieve 10x growth in Caltrain ridership by 2040	
Reduction in East of 101 Area peak hour traffic volumes	
Community waste generated	89,136 tons
Tons of edible food recovered and redistributed	
Gallon per capita per day (GPCD)	86 gpcd
Number of MWELO compliant landscape renovations	
Number of plumbing fixture upgrades	
Number of trees planted	15,000 trees
Canopy coverage in disadvantaged communities	
Number of riparian restoration projects completed in Colma Creek watershed	

SamTrans Stop on Grand Ave.



CHAPTER 5

Implementing the CAP

Community Participation at Shape SSF Meeting

The CAP directs City staff to develop and implement specific policies, plans, programs, and projects over the next 10 years to achieve the City's climate goals. Successful implementation of the CAP strategies will require commitment and coordination from staff throughout the City. Although the City will initiate climate action, community involvement is an essential component of the CAP implementation process, as many strategies depend on active participation by residents and businesses.

5.1 PARTNERSHIPS

Partnerships are an integral part of CAP implementation. They allow the City to leverage existing programs and funding opportunities and take advantage of state and regional efforts. Many of the programs and incentives outlined in the CAP will come from the utilities including PG&E and PCE, CalWater, and SSF Scavengers. Furthermore, creating these partnerships will help the City stay updated about new program development and foster relationships to improve data collection processes. The City will work with the providers to provide real-time information on resource use to help individuals make decisions about their activities.

Equity vs. Equality

Though equity is like equality, they are not the same thing. Equality means everyone receives the same thing regardless of any other factors. Equity, on the other hand, is about ensuring that people have access to the same opportunities to thrive and succeed. A climate equity lens recognizes that people may have different starting points and may need different types and levels of support to adapt to climate change in order to achieve fairness in climate outcomes. Thus, climate equity is achieved when socioeconomic and environmental factors, such as race, income, education, or place, can no longer be used to predict the health, economic, or other wellbeing outcomes from climate change.

For the purposes of the CAP, the following dimensions of equity are considered:

Procedural
Create processes that are transparent, fair, and inclusive in developing and implementing any climate program, plan, or policy. This dimension of equity focuses on ensuring that all people are treated openly and fairly, and on increasing opportunities for engagement and ownership in decision-making in all phases of climate resilience planning and CAP implementation.

Structural:
Address the underlying structural and institutional systems that are the root causes of social and racial inequities. It is a dimension of equity that makes a commitment to correct past harms and prevent future unintended consequences from climate-related decision-making, such as in the CAP implementation.

Distributional:
Fairly distribute resources, benefits, and burdens. This dimension of equity focuses on prioritizing resources for communities that experience the greatest climate and environmental inequities, disproportionate impacts, and have the greatest unmet environmental health needs.

5.2 EQUITABLE PROGRAM IMPLEMENTATION

Achieving climate equity will require careful design and execution of policies and programs to improve outcomes for disadvantaged populations in all stages of CAP implementation. When equity is prioritized, climate mitigation strategies can address and lessen existing social, racial, and health disparities.

Implementation of this CAP will be guided by two equity guardrails:

1. A majority of the local benefits resulting from CAP implementation will be focused in disadvantaged communities by meeting priority community needs, improving public health, building on community assets and values, and increasing community resilience.

2. Required measures do not present an undue cost burden on those least able to afford implementation. Financial and technical assistance will be prioritized for disadvantaged communities and sensitive populations, including renters, to allow them to participate in CAP programs and fully realize all benefits.

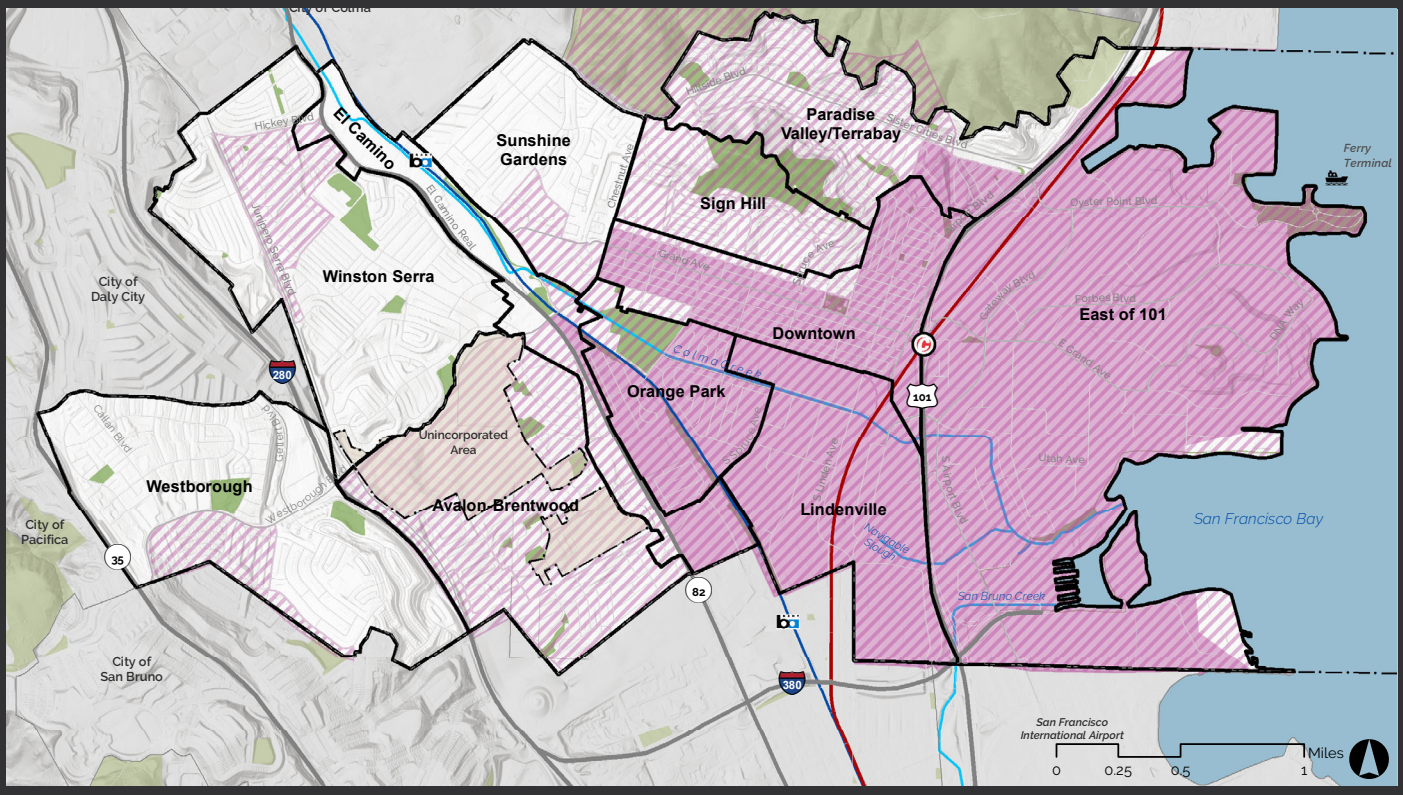
Shape SSF Community Conversation Presentation in Spanish on Climate Adaptation and Safety

As part of the General Plan Update process, the City has undertaken studies related to health and environmental justice. These analyses can guide CAP implementation program design to ensure that the above equity guardrails are being followed. The General Plan Update has identified many of the City's neighborhoods as of particular concern related to environmental justice. In South San Francisco, the sub-areas of Avalon-Brentwood, Downtown, East of 101, Lindenville, Orange Park, Paradise Valley/Terrabay, and Sign Hill are identified as disadvantaged communities (Figure 5). In addition, the sub-areas of El Camino, Sunshine Gardens, Westborough, and Winston Serra also have small areas that are identified as disadvantaged communities. These disadvantaged communities were identified based on the State's recommended screening methods,[10] which includes CalEnviroScreen 4.0 and low-income areas with high pollution burden, in accordance with The Planning for Healthy Communities Act of 2016 (Senate Bill 1000).

10. *California Office of Planning and Research. General Plan Guidelines Chapter 4: Required Elements. 2020. Retrieved from: https://opr.ca.gov/docs/20200706-GPG_Chapter_4_EJ.pdf.*

Downtown

Figure 5: Disadvantaged Communities



Disadvantaged Communities

Sources: CalEnviroScreen 4.0 (2021); ACS15-19 (5yr); City of South San Francisco (2019); County of San Mateo (2019); ESRI (2021).

- Sub-areas
- Low Income Areas with High Pollution Burden
- CalEnviroScreen 4.0 Results
- City of South San Francisco
- Unincorporated Area in City Sphere
- Ferry Terminal Station
- Caltrain Station
- Caltrain
- BART Station
- BART
- Highway
- Arterial Road
- Local Road
- City Parks, Open Space, & Joint Facilities
- Context Parks
- Waterbody
- Streams

Implementing measures in this plan can enhance climate equity in the City's disadvantaged communities in the following ways:

Measures TL 1.1 (pg.36) and TL 2.1 (pg.37) are designed to not only reduce transportation related emissions but improve air quality in the East of 101 neighborhood by reducing VMT and promoting electric vehicle adoption. According to CalEnviroScreen 4.0, South San Francisco's East of 101 neighborhood is in the 95th percentile for diesel particulate matter (PM), which means that 95% of communities in California have less diesel PM pollution than the East of 101 neighborhood.

Measures BE 2.1–BE 2.4 (pg.35) related to the electrification of existing buildings will be implemented through a phased-in methodical approach, leveraging available energy efficiency resources, to ensure that renters and other vulnerable populations can enjoy improved indoor environmental health and safety while being protected from housing dislocations that might otherwise arise from the transition.

Measure CS 2.1 (pg.43) is designed to increase tree canopy throughout the city by planting new trees in accordance with the Urban Forest Master Plan. Climate equity can be achieved by prioritizing tree planting in disadvantaged communities with low access to open space, such as Downtown. New trees will capture carbon, help to reduce the urban heat island effect, make walking and biking more pleasant on hot days, and improve local air quality; all of which improve public health and wellbeing.

5.3 COST EFFECTIVENESS

There are many different approaches to establishing implementation cost estimates for CAP strategies. Implementation costs include both administrative and programmatic costs to the City, and equipment and services costs to residents and businesses. Costs can be expressed as relative costs to a determined baseline, up-front first costs or the direct costs of implementation, or long-term cost effectiveness, the total cost of action implementation over time accounting for cost savings over the lifetime of the intervention. All these costs estimates differ. Table 4 shows the estimated cost effectiveness of CAP strategies expressed as potential GHG reductions relative to cost. These cost estimates may change as the market adjusts to future technological adoption and advancements or additional climate measures are pursued.

The GHG abatement cost for South San Francisco is in line with that of the State. However, the two analyses differ based on the GHG sectors and reduction measures included.

Table 4: CAP Implementation Cost Effectiveness

	CAP Outcome	Cost	GHG Reduction Potential (MTCO2e)	Relative Cost Effectiveness (GHG Reduction/Cost)
Clean Energy	Local Solar Installations	High	Low	Low
	Clean Energy EcoPlus - PCE	Low	High	High
Buildings	New Building Electrification	Low	Medium	Medium
	Existing Building Electrification	High	High	Low
	Existing Building Energy Efficiency	Medium	Low	Medium
Transportation	EV Adoption	Medium	Low	Medium
	Mode Shift	High	High	High
Solid Waste	SB 1383 Compliance	High	Low	Low
Water	Outdoor Water Use	Low	Low	High
Sequestration	Trees	High	Low	Low
	Creek Restoration	High	Low	
	Carbon Farming	TBD		

5.4 FUNDING OPPORTUNITIES

The actions in this CAP do not necessarily represent the lowest cost pathway to achieve South San Francisco's GHG targets. Instead, the actions were chosen to reflect local conditions and priorities, address equity, and to create multiple benefits in addition to emissions reductions. However, implementing the CAP can also provide economic benefits across the city including expanding the local green economy, job creation, and reducing costs for South San Francisco residents and businesses. For example, making walking and biking safer and transit more accessible can reduce the costs of traveling around South San Francisco, while promoting an active lifestyle that can help improve health outcomes.

Below is a list of potential funding sources as well as available incentive programs to help reduce the cost of implementing CAP actions:

City's General Fund
This is the primary source of funding for City operations and can be used for any public purpose. It is allocated as part of the overall City budget, approved by City Council. The large number of competing priorities for General Fund dollars requires that the City seek out other sources of funding wherever possible to increase the likelihood of successful implementation for each action.

Bonds
Local governments can sell bonds to investors that raise capital for a specific objective. Bonds must be approved by voters and may have additional oversight or administration requirements.

Taxes
Taxes generate revenue to support local, regional, and state operations. Taxes can be used either for general purposes (e.g. any city service as needed) or specific purposes (e.g. climate change mitigation) but require voter approval. Examples of taxes include:

- Utility User Tax
- Real Estate Transfer Tax
- Parcel Tax

State and Federal Grants
Grants are usually given without expectation of repayment, but often require either matching funds from the City and/or staff time to administer the grants. Grants often fund new and innovative programs. However, grants are also competitive and are not a guaranteed source of funding. The following agencies offer climate related grants:

- Department of Energy
- California Energy Commission
- PG&E
- Bay Area Air Quality Management District
- Electrify America
- FTA Planning Grants
- CARB
- CalFire
- FEMA
- CDFA Healthy Soils Initiative
- CalRecycle

Incentives and Rebates
Incentives and rebates are usually monetary motivators that can help cover the cost of implementing specific programs or equipment. Many utilities have incentive programs to help spur investment, pay for equipment, and expand various markets for newer technologies. Existing programs include:

- PCE Residential and Commercial Rebates
- BayREN Home+ Rebates
- California Water Service rebates
- CA Clean Vehicle Rebate Project
- Single-family Solar Affordable Solar Housing (SASH) Program
- Multifamily Affordable Solar Housing (MASH) Program
- Residential and Commercial Federal ITC for solar photovoltaics
- New local incentives programs as needed
- PACE financing

5.5 MONITORING AND EVALUATION

Monitoring of the CAP's performance involves tracking the performance of individual strategies and estimating the GHG emissions reductions resulting from their implementation. The performance metrics identified for each strategy will be tracked using readily accessible data that is useful for estimating emissions reductions. Periodic re-inventorying of local government and community-wide emissions will also be needed to validate overall progress toward the City's GHG reduction targets.

Monitoring of and reporting on the CAP's performance involves tracking the implementation of individual strategies and estimating the GHG emissions reductions resulting from them. The performance metrics identified for each strategy will be tracked using readily accessible data that is useful for estimating emissions reductions. Periodic re-inventorying of local government and community-wide emissions will also be needed to validate overall progress toward the City's GHG reduction targets.

GHG Inventory: Staff will update the City's community and municipal operations emissions inventory every three to five years. Inventory updates will encompass all inventory sectors (residential energy, commercial/industrial energy, large industrial energy, on- and off-road transportation, solid waste, wastewater, water, and municipal operations).

Annual CAP Progress Report: The City's Chief Sustainability Officer will prepare annual progress reports on CAP implementation to be presented to City Council, Planning Commission, and other stakeholders as needed. The report will evaluate the successes and challenges in meeting the City's GHG reduction targets (as they become known or apparent), provide the status of implementing actions for each reduction strategy in the CAP (e.g., initiated, ongoing, completed), assess the effectiveness of each strategy, and recommend adjustments to programs or actions as needed.

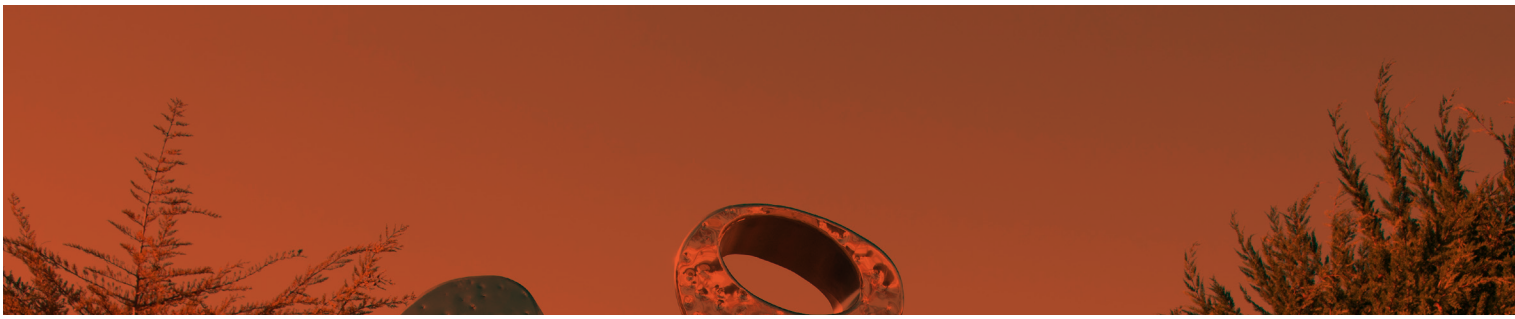
CAP Updates: A comprehensive revision of the CAP should occur at least every five to ten years to monitor progress of GHG reductions against the 2030 target and 2045 goal of carbon neutrality, to account for the impact of new legislation and state programs on GHG targets and emissions reductions, and to adjust strategies and actions as needed to reach the targets. In preparation for the 2030 update and annual reporting to the Planning Commission and City Council, staff will use greenhouse gas inventories and CAP measure implementation to track South San Francisco progress in reducing emissions, VMT, waste generation, and energy use over time using readily available data.

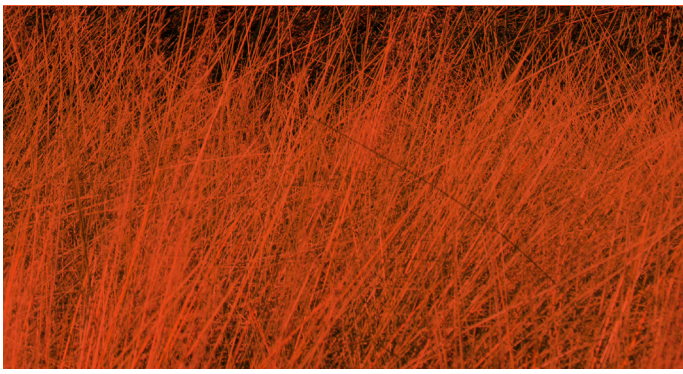
Oversight and Accountability

Options for an ongoing structure for oversight in CAP implementation and long-term plan updates:

- Create an internal Sustainability and Climate Action Team (led by the City's Chief Sustainability Officer) to assist in coordinating and implementing actions across departments, identifying synergies/collaboration opportunities, and identifying funding sources.
- Develop and maintain a community-facing Climate Action Tracking Dashboard for transparency.
- Prepare annual updates for the Planning Commission and City Council on CAP progress.

City Hall





Glossary

A

Active transportation
This is a non-motorized form of transportation, primarily made up of walking and bicycling.

Adjusted Business-as-Usual Forecast (ABAU)
The influence of federal, statewide, and regional policies (e.g., Pavley Clean Car Standards) will have on the City's projected emissions.

B

Business-as-Usual (BAU)
A GHG emissions scenario that is based on the assumption that no mitigation policies or measures will be implemented beyond those that are already in progress that can serve to highlight the level of emissions that would occur without further policy effort.

C

Carbon neutrality
The balance between carbon emissions and carbon absorption from the atmosphere.

Carbon sequestration
The process of capturing and storing carbon dioxide from the atmosphere.

Climate change
Climate change refers to changes in the average and/or the variability of temperature, rainfall, and extreme weather that persist for an extended period

Climate hazard
Short or long-term climate events that have the potential to cause damage or harm to humans and natural systems. These include meteorological, climatological, hydrological, geophysical or biological events.

Co-benefit
Non-greenhouse gas-related benefits of climate actions. Measuring co-benefits examines how climate action is interrelated with and delivers outcomes for provision of basic services, health, prosperity and other sustainable development agendas.

Community solar
A solar power project where the energy and benefits of that project go towards multiple energy customers (e.g., individuals, businesses, nonprofits).

D

Decarbonization
Process of reducing embodied or operational GHG emissions. Typically refers to a reduction of the carbon emissions associated with energy consumption, industry and transportation. The intention to decarbonize the electric power grid is often referred to as Grid Decarbonization.

Disadvantaged community
A disadvantaged community is defined as "a low-income area that is disproportionately affected by environmental pollution and other hazards that can lead to negative health effects, exposure, or environmental degradation.

Distributed Energy Resource (DER)
These resources are small, modular energy generation and storage systems that provide electricity or energy and can be connected or independent from the larger electrical power grid.

E

Electrification
The process of transitioning away from technologies that use fossil fuels to technologies that use electricity. Electrification of systems paired with a power grid with 100% renewable energy sources can significantly reduce GHG emissions.

Emissions inventory
A quantified list of a city's GHG emissions and sources.

Emissions reduction potential
A measurement of the potential to decrease greenhouse gas (GHG) emissions from a particular sector or through an action. The abatement potential is measured in GHG emissions (e.g. tons of carbon dioxide equivalent).

Equity
The absence of avoidable or remediable differences among groups of people, whether those groups are defined socially, economically, demographically or geographically. As opposed to the concept of equality where everyone is given equal access, equity provides proportional access to redress historical and current disparities and ensure the same level of opportunity for all.

G

Green building
Green building is a holistic concept that starts with the understanding that the built environment can have profound effects, both positive and negative, on the natural environment, as well as the people who inhabit buildings every day. Green building is an effort to amplify the positive and mitigate the negative of these effects throughout the entire life cycle of a building. Considerations include energy use, water use, indoor environmental quality, material section and the building's effects on its site.

Greenhouse Gas (GHG)
These are gases within the atmosphere that accelerate the warming of the Earth and are released from human activities that burn fossil fuels or from historic carbon sinks, such as melting permafrost.

Greywater
The water generated from buildings that is not contaminated (e.g., sinks, dishwashers).

Greywater systems
This system collects domestic, uncontaminated wastewater and reuses it for irrigation or toilet flushing. Sources of greywater include sinks, showers, washing machines, and dishwashers.

L

LEED
The Leadership in Energy and Environmental Design (LEED) green building rating system is used to evaluate the sustainable design strategies of new and retrofitted projects.

M

Mode shift
The transition from using one habitual form of travel, or mode, to another. Transportation modes include mass transit, non-motorized transit and automobiles.

Mode share
A number or percentage of users or trips, using a particular type of transportation such as driving a single-occupancy vehicle, carpooling, riding public transit, walking or cycling

R

Reach code
A local building energy code that sets targets beyond the state requirements for energy use or energy efficiency.

Resilience
Resilience is the ability of an individual, a community, an organization, or a natural system to prepare for disruptions, to adapt to changing conditions, withstand and rapidly recover from shocks and stresses, and to adapt and grow from a disruptive experience.

Retrocommissioning
The process of improving and retrofitting building equipment and operation systems.

S

Sustainability
Sustainability focuses on meeting the needs of the present without compromising the ability of future generations to meet their needs.

T

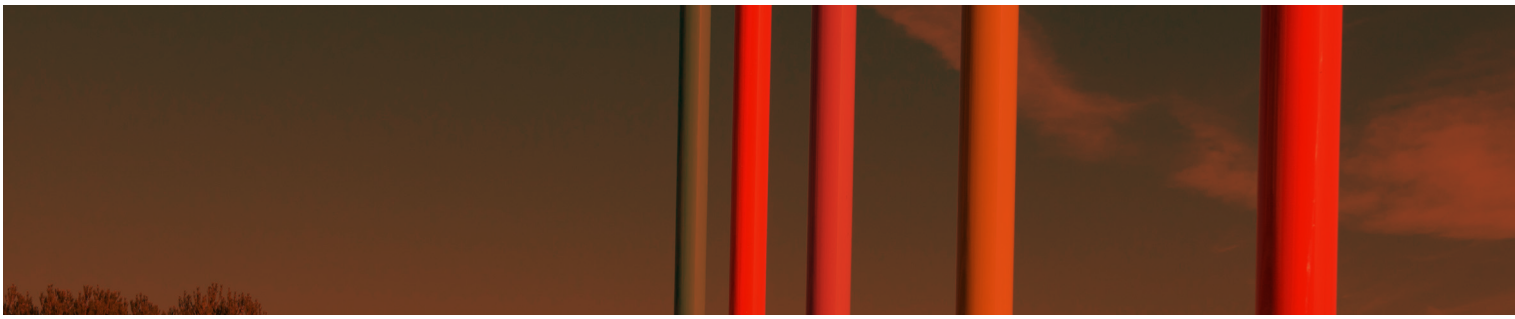
Transportation Demand Management (TDM)
Strategies to change travel behavior in order to reduce traffic congestion, increase safety and mobility and conserve energy and reduce greenhouse gas emissions. Strategies may include ridesharing, telecommuting, park-and-ride programs and alternative work schedules.

V

Vehicle Miles Traveled (VMT)
A measurement of miles traveled by vehicles within a specified area for a specified time period.

Z

Zero Emission Vehicle (ZEV)
Vehicles that produce no tailpipe emissions. Generally, ZEVs feature electric powertrains either from a battery or a hydrogen fuel cell. ZEVs may still be responsible for some greenhouse gas emissions, if the GHG content from the electricity generation comes from fossil fuel sources.



APPENDICES

A. 2017 Inventory Report

Greenhouse Gas Emissions Inventory

This memorandum provides an overview of community-wide greenhouse gas (GHG) emissions by sector that were emitted in 2005 (baseline emissions) and 2017 within the City of South San Francisco. The five emissions sectors that are included in this report are energy, transportation, off-road transportation, solid waste, and water. This report presents a summary of the 2005 GHG emissions and details the 2017 data year community GHG inventory completed in 2019. It also provides an emissions forecast to 2040 and suggests GHG reduction targets for the forthcoming Climate Action Plan (CAP).

Key Findings

- Community-wide, the City of South San Francisco emitted 609,452 metric tons of carbon dioxide equivalent ($MTCO_2e$) in 2017, up 18% from the 2005 greenhouse gas emissions estimate of 517,757 $MTCO_2e$.
- Greenhouse gas emissions from transportation were the largest sector, accounting for 44% of all community emissions (268,787 $MTCO_2e$).
- Nonresidential energy use including electricity and natural gas accounted for the second largest amount of emissions 32% or 193,190 $MTCO_2e$.
- Despite a 18% increase in overall emissions, annual per service population emissions only increased from 2005 to 2017 by 3% from 4.81 $MTCO_2e$ in 2005 to 4.94 $MTCO_2e$ in 2017.

1 Safety Element Policy Framework

Community GHG Inventory Overview

2005 Community GHG Inventory

The community of South San Francisco total 2005 GHG emissions were estimated to be 517,757 $MTCO_2e$. The inventory included energy (residential and nonresidential), transportation, off-road transportation,[1] solid waste, and water. Of the six sectors, transportation accounted for the largest amount of GHG emissions with estimated emissions of 196,910 $MTCO_2e$ or 38% of total emissions. The second largest sector was nonresidential energy use with estimated emissions of 160,960 $MTCO_2e$ or 31% of total emissions. The remaining 31% of emissions were made up by the residential energy, solid waste, water, and off-road transportation sectors. Table 1 shows the 2005 total community emissions by sector.

Table 1: Total Annual Community GHG Emissions (2005)

Community Sector	Subsector	Subsector $MTCO_2e$	Sector $MTCO_2e$	Percent of Total
Transportation	On-Road Transportation	196,910	196,910	38%
Nonresidential Energy	Electricity	56,150		
	Natural Gas	104,810	160,960	31%
Residential Energy	Electricity	22,430		
	Natural Gas	47,940	70,370	14%
Solid Waste	Landfilled Waste	52,323		
	Closed Landfill	13,216	65,540	13%
Water	Water Use	1,580	1,580	0.3%
Off-Road	Lawn and Garden Equipment	1,110		
	Construction Equipment	21,300	22,400	4%
Total			517,760	100%

Source: South San Francisco GHG Inventory (2011).

The 2005 emissions presented in Table 1 differ from those presented by the City in the 2005 GHG Inventory Report because as part of the 2017 inventory, 2005 energy emissions were updated to reflect more current use and emissions data. Similarly, solid waste emissions were updated to maintain consistency with 2017 methodology. As a result of these adjustments, the community base year greenhouse gas inventory decreased.

[1] The off-road transportation sector includes construction and landscaping emissions.0,

Community emissions fell from the 2005 *reported* base year emissions of 560,414 $MTCO_2e$ to the 2005 adjusted base year total of 517,760 $MTCO_2e$, a 7.6% reduction.

3 Safety Element Policy Framework

2017 Community GHG Inventory

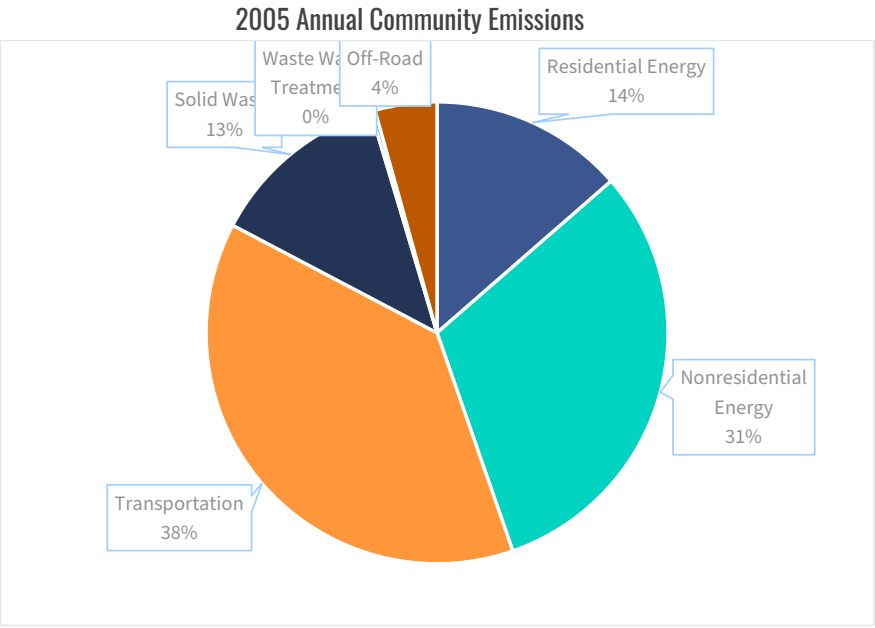
This report summarizes the community-wide inventory of GHG emissions using data from calendar year 2017, the most recent year for which complete data is available.[2] Table 2 provides the 2017 GHG emissions inventory results by sector. In 2017, South San Francisco's estimated total GHG emissions were 609,452 $MTCO_2e$, an increase of 91,695 $MTCO_2e$. This inventory is an estimate based on the best available data. As in 2005, transportation was the largest contributor to total GHG emissions with an estimated 268,787 $MTCO_2e$ or 44% of the City's total 2017 emissions. Nonresidential energy was the second largest sector with estimated emissions of 193,910 or 32% of emissions. Although the second largest contributor to emissions, nonresidential energy emissions are likely an underestimate due to incomplete data caused by customer data aggregation laws. The remaining 24% of emissions include residential energy, solid waste, water, and off-road transportation (see Table 2). Figure 1 depicts the proportion of emissions by sector for years 2005 and 2017.

Table 2: Total Annual Community GHG Emissions (2017)

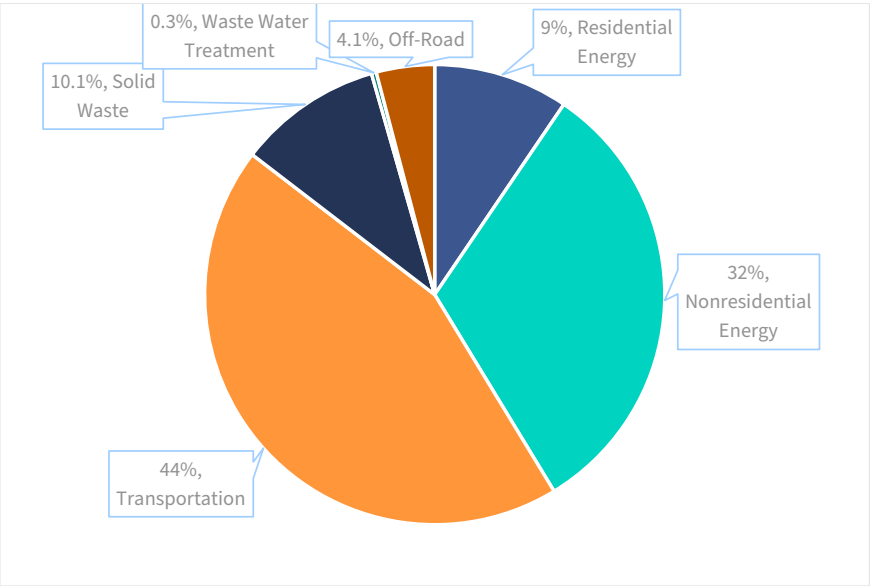
Community Sector	Subsector	Subsector $MTCO_2e$	Sector $MTCO_2e$	Percent of Total
Transportation	On-Road Transportation	268,222		
	Bart	157		
	CalTrain	407	268,787	44%
Nonresidential Energy	Electricity	119,700		
	Natural Gas	42,310	193,910	32%
Residential Energy	Electricity	17,500		
	Natural Gas	40,370	57,870	9%
Solid Waste	Landfilled Waste	48,623		
	Closed Landfill	13,231	61,854	10%
Water	Water Use	2,092	2,092	0.3%
Off-Road	Lawn and Garden Equipment	1,180		
	Construction Equipment	23,760	24,940	4%
Total			609,452	100%

[2] Energy data from calendar year 2016 was used as a proxy when 2017 data was unavailable.

Figure 1: South San Francisco Total Annual Community GHG Emissions in 2005 and 2017



5 Safety Element Policy Framework



City of South San Francisco General Plan Update 6

Furthermore, per service population emissions increased by 3% over the same period. The service area population includes the populations that live and/or work in the City. It is the sum of population and jobs. These numbers show that population, job growth, and a strong regional economy are the primary drivers of emissions increases.

Table 3: South San Francisco Total Annual Community GHG Emissions in 2005 and 2017 (in $MTCO_2e$)

Community Sector	2005	2017	2005 Per Service Area	2017 Per Service Area	Total Percent Change
Transportation	196,910	268,787	1.83	2.18	19%
Nonresidential Energy	160,960	193,910	1.50	1.57	5%
Residential Energy	70,370	57,870	0.65	0.47	-28%
Solid Waste	65,540	61,854	0.61	0.50	-18%
Water	1,578	2,092	0.01	0.02	16%
Off-Road	22,400	24,490	0.21	0.20	-3%
Total	517,760	573,998	4.81	4.94	3%

Community Sector Analysis

Community Energy

This section presents GHG emissions for the energy sector, specifically emissions generated from residential and nonresidential energy use that occurred within City limits. This section provides electricity and natural gas activity data and emissions estimates for the baseline year 2005 and 2017. Calendar year 2016 electricity data is used as a proxy for 2017.

Electricity

Pacific Gas and Electric (PG&E) and Peninsula Clean Energy (PCE) provide electric service to the community and offer community electricity data to local agencies. The electricity data (presented in kWh) in Table 4 is separated between residential and nonresidential uses, which is the most detailed level available to prevent data from being removed for privacy purposes.[3] However, nonresidential energy is likely underestimated due to some energy use data being

[3] *In California, individual energy (electricity and natural gas) account data is protected as private information. For specific purposes, certain groups may access detailed information. For example, academic researchers can access disaggregated data to conduct analyses as long as protected information remains confidential. To ensure the confidentiality of each individual customer's*

masked for failing to meet aggregation standards. Residential data includes single family homes and multi-family dwellings, while nonresidential data includes commercial and industrial uses. From 2005 to 2016 residential electricity usage decreased by 22% and nonresidential electricity usage increased by 36%. Between 2005 and 2016 total electricity use increased by 20%. Residential energy emissions have decreased because the City transitioned to carbon-free energy provided by PCE. The 20% increase in electricity use may be the result of a growing economy with more local jobs.

Table 4: Total Annual Community Electricity Usage (2005-2016)

Year	Residential (kWh)	Nonresidential (kWh)	Total (kWh)
2005	100,353,340	251,184,690	351,538,030
2006	101,399,397	372,435,624	473,835,021
2007	104,223,659	387,842,380	492,066,039
2008	103,842,286	392,244,819	496,087,105
2009	105,758,034	436,875,374	542,633,408
2010	106,464,526	443,190,514	549,655,040
2011	104,499,692	440,751,036	545,250,728
2012	103,261,346	437,502,145	540,763,491
2013	101,585,127	429,935,561	531,520,688
2014	96,368,597	436,098,366	532,466,963
2015	95,163,263	437,758,557	532,921,820
2016	91,189,412	398,271,557	489,460,969
2017			466,334,769

Note: Only total electricity use data is available for 2017 because that is the year South San Francisco transitioned from PG&E to PCE.

To calculate GHG emissions, an emissions factor is applied to the activity data. Electricity suppliers provided CO_2 emissions factor. In addition to carbon dioxide (CO_2), small amounts of methane (CH_4) and nitrous oxide (N_2O) are released in the electricity generation process. CH_4 and N_2O emissions factors are provided by the ICLEI Community Protocol. Variability of the emissions factors occur primarily due to fluctuations in suppliers' energy portfolio each year.

CO_2 is the most commonly referenced GHG, however, numerous gasses have greenhouse characteristics. CH_4 and N_2O are commonly accounted for in GHG inventories. These gasses have a greater global warming potential; CH_4 traps approximately 28 times as much heat as CO_2 over a 100-year period and N_2O traps approximately 265 times as much heat. To account for these differences, a factor is applied to the gasses emissions to calculate a CO_2 equivalence.

consumption information, the California Public Utilities Commission (CPUC) masks data that does not meet minimum aggregation thresholds. For more information about these privacy regulations, please visit CPUC decision (D.14-05-016).

Table 5 provides the emission factors and GHG emissions from electricity use in the city by residential and nonresidential subsectors from 2005-2016. Over this period, electricity related GHG emissions increased by 9%.

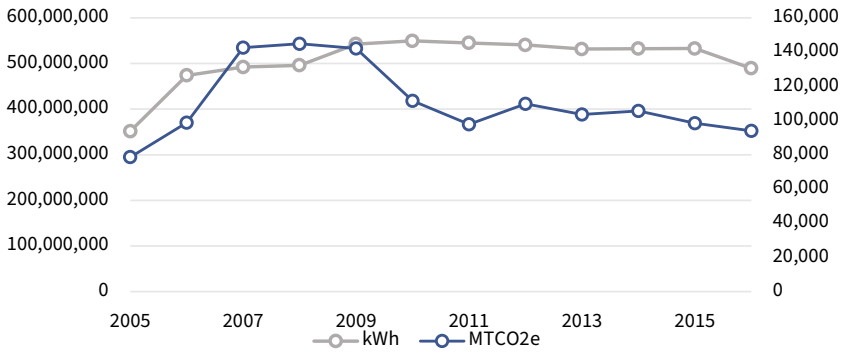
Table 5: Total Annual Community GHG Emissions from Electricity Use (2005-2016)

Year	Emissions Factor	Residential ($MTCO_2e$)	Nonresidential ($MTCO_2e$)	Total ($MTCO_2e$)
2005	0.000224	22,430	56,150	78,580
2006	0.000208	21,120	77,580	98,700
2007	0.000290	30,220	112,440	142,660
2008	0.000292	30,330	114,570	144,900
2009	0.000262	27,700	114,430	142,130
2010	0.000203	21,610	89,940	111,550
2011	0.000179	18,740	79,050	97,790
2012	0.000203	20,950	88,780	109,730
2013	0.000195	19,780	83,700	103,480
2014	0.000198	19,100	86,440	105,540
2015	0.000185	17,570	80,820	98,390
2016	0.000192	17,500	76,420	93,920

Note: 2016 data is used as a proxy since complete 2017 data was unavailable due to aggregation laws.

Figure 2 illustrates GHG and kWh activity data trends between 2005 and 2017. It is important to note that while energy use has been increasing, GHG emissions have been more variable due to changes in PG&E and PCE's power portfolio and the related carbon intensity of its electricity supply.

Figure 2: Total Annual Community Electricity Use and GHG Emissions (2005-2016)



9 Greenhouse Gas Inventory

Natural Gas

PG&E provides natural gas utility services to South San Francisco. Table 6 provides the natural gas activity data in therms from 2005-2017 separated by residential and nonresidential uses. Nonresidential use combines commercial and industrial use. The natural gas data in Table 6 shows a residential decrease of 13%, a nonresidential increase of 12%, and a combined decrease of 4% for the sector.

The reduction in residential natural gas usage reflects increased energy efficiency of residential appliances, mainly water heating and space heating, as well as a propensity for new construction to be built with electric appliances rather than those that use natural gas. The increase in nonresidential natural gas use reflects the strong and growing economy in South San Francisco and the Bay area as a whole. Over this period biotech companies have expanded operation within the City. However, this increase may be underestimated because the nonresidential sector in South San Francisco is dominated by a few large users of natural gas, thus the data may have been "masked" due to aggregation laws. This explanation would suggest that only partial data was provided for 2005-2017 in order to protect user privacy, which results in an incomplete picture of community natural gas use and associated emissions.

Table 6: Total Annual Community Natural Gas Use (2005-2017)

Year	Residential (Therms)	Nonresidential (Therms)	Total (Therms)
2005	9,007,350	19,691,037	28,698,387
2006	9,140,829	20,643,362	29,784,191
2007	9,532,983	22,478,454	32,011,437
2008	9,586,261	22,245,647	31,831,908
2009	9,384,862	21,984,803	31,369,665
2010	9,428,453	21,416,373	30,844,826
2011	9,471,296	21,538,379	31,009,675
2012	9,208,755	21,384,744	30,593,499
2013	9,129,777	21,048,332	30,178,109
2014	7,379,115	-	-
2015	7,310,064	-	-
2016	7,585,487	-	-
2017	7,793,747	22,072,849	29,866,596

Note: Nonresidential data is not available for years 2014-2016.

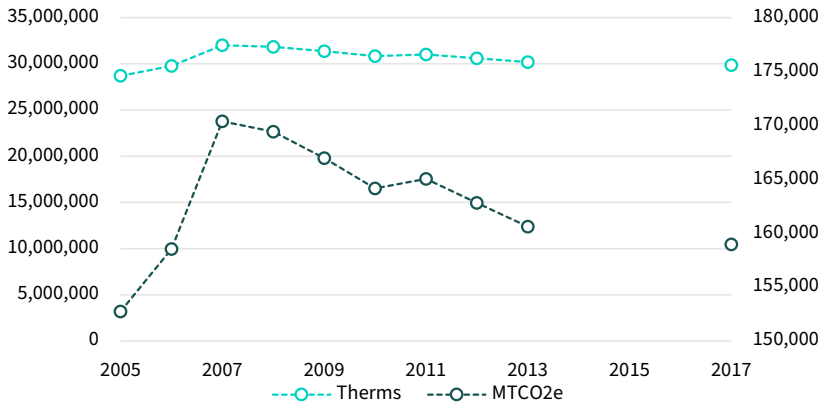
As with electricity, GHG emissions are estimated from activity data by applying an emission coefficient. Unlike electricity, the inventory does not assume changes in the carbon intensity of natural gas in any given year, as the carbon intensity of the combustion of natural gas does not vary annually. Table 7 provides the GHG emissions estimates for natural gas consumption in the city from 2005 to 2017. These estimates are using the most current emissions coefficient for natural gas. Similar to the activity data, residential emissions decreased while nonresidential emissions increased with a total increase in natural gas-related emissions of 4%.

Table 7: Total Annual Community GHG Emission from Natural Gas (2005-2017)

Year	Residential ($MTCO_2e$)	Nonresidential ($MTCO_2e$)	Total ($MTCO_2e$)
2005	47,940	104,810	152,750
2006	48,650	109,880	158,530
2007	50,740	119,640	170,380
2008	51,020	118,410	169,430
2009	49,950	117,020	166,970
2010	50,180	113,990	164,170
2011	50,410	114,640	165,050
2012	49,010	113,820	162,830
2013	48,590	112,030	160,620
2014	39,280	-	-
2015	38,910	-	-
2016	40,370	-	-
2017	41,480	117,490	158,970

Note: Nonresidential data from 2014-2016 is not available.

Figure 3: Total Annual Community Natural Gas Use and GHG Emissions (2005-2017)



Total Energy GHG Emissions

Table 8 shows the total energy related GHG emissions separated by energy type and subsector. Residential energy use subsector emissions decreased by 18% between 2005 and 2017 and nonresidential energy use subsector emissions increased by 20%. Overall energy GHG emissions increased by 9% from 2005 to 2017. The reduction in residential energy emissions is the result of a less carbon intensive energy supply from PCE in 2017 as compared to 2005. Residential electricity emissions will continue to decline as the City fully transitions to carbon-free electricity from PCE. As discussed above, nonresidential energy use has increased most likely due to a strong, growing economy between 2005 and 2017.

Table 9 shows that VMT has increased in South San Francisco by 48% from 2005 to 2017 and associated GHG emissions have increased by 37%. 2005 activity data for BART and Caltrain was not available but table 9 also shows that emissions from the two transit services has decreased from 2005 to 2017.

Table 9: Total Annual Community GHG Emissions from Transportation in 2005 and 2017

Transit Type	2005			2017		
	Total VMT	$MTCO_2e$/ VMT	Total Emissions	Total VMT	$MTCO_2e$/ VMT	Total Emissions
Vehicles	400,243,680	0.000670	195,790	591,821,296	0.000453	268,222
BART			612	1,701,012	0.0000925	157
Caltrain			508	3,059,743	0.000133	407
Total Sector			196,910			268,787

The smaller increase in GHG emissions is attributed to State and Federal regulations. This includes improved fuel efficiency standards, low carbon fuel standards, and an increasingly efficient overall fleet of vehicles (including an increased uptake of electric, hybrid, and high efficiency vehicles) within the city that is resulting in fewer emissions per mile of VMT, despite an increase in miles driven. The reduction in emissions from BART and Caltrain is also most likely due to cleaner electricity with a proportion coming from carbon-free sources including renewables.

Water Use

The water sector uses energy to collect, convey, treat, and deliver water to users, and then it uses additional energy to collect, treat, and dispose of the resulting wastewater. This energy use yields both direct and indirect greenhouse gas emissions. Water service is provided to the City of South San Francisco by California Water Service's South San Francisco District.

Water use was not originally included in the 2005 baseline year inventory, so the 2017 inventory process updated it to include for comparison. Table 10 provides the total water use and associated GHG emissions for the population of South San Francisco. GHG emissions were calculated by combining the amount of water used with emissions factors. Emissions from the water sector increased by 33% from 2005 to 2017 despite a decrease in total water use. This difference may be the result of different data sources and differences in emissions calculation methodology.

Table 10: Total Annual Community Water Use and GHG Emissions in 2005 and 2017

2005		2017	
Water Use (million gallons)	**Total Emissions ($MTCO_2e$)**	**Water Use (million gallons)**	**Total Emissions ($MTCO_2e$)**
2,841	1,578	2,115	2,092

Source: 2010 and 2015 California Water Service South San Francisco District UWMP

Solid Waste

This section presents GHG emissions for the solid waste sector, specifically emissions from the disposal of solid waste produced within the City limits into a landfill as well as fugitive emissions from the closed Oyster Point Landfill, which was open from 1956-1969 and contains about 1.4 million tons of solid waste.

This section provides solid waste activity data for the baseline year 2005 as well as emissions estimates for years 2005 and 2017. Landfilled waste data was provided by CalRecycle for the City of South San Francisco and Oyster Point Landfill emissions were calculated using CARB's Landfill Emissions Tool. The amount of waste generated and sent to landfill in South San Francisco has decreased by 7% since 2005.

As shown in Table 11, solid waste disposal emissions decreased by 5.6% from 2005 to 2017. This decrease in emissions is most likely due to increased recycling and composting efforts.

Table 11: Total Annual Community Solid Waste Tons and GHG Emissions (2005-2017)

Solid Waste	2005		2017	
	Tons	Emissions $MTCO_2e$	**Tons**	Emissions $MTCO_2e$
Landfilled Waste	95,920	52,323	89,136	48,623
Closed Landfill		13,216		13,231
	Total Sector	65,539		61,854

Off-Road

This section presents the GHG emissions for off-road activity, specifically emissions from construction and lawn and garden equipment use within the City.

Off-road emissions data for San Mateo County was gathered from the CARB OFFROAD2007 modeling tool. Since the CARB tool models emissions for the entire county, city specific emissions data was proportioned using demographic housing data. Data from the tool was compiled and summed according to emissions type. Emissions were then converted into carbon dioxide equivalents. The large decrease in off-road emissions shown in Table 12 may be a result of difference in methodology.

Table 12: Total Annual Off-Road GHG Emissions in 2005 and 2017

	2005		2017	
	Construction	Lawn & Garden	Construction	Lawn & Garden
t CO_2/day	453.5	33.4	546.2	37.1
t CH_4/day	0.09	0.07	0.05	0.06
t N_2O/day	0.003	0.03	0.003	0.02
t CO_2e/day	456.7	42.1	548.4	45.0
t CO_2e/year	166,706.9	15,363.6	200,171.9	16,415.4
MTCO_2e/year	151,235.5	13,937.7	181,594.8	14,891.9

Source: CARB OFFROAD2007 modeling tool (San Mateo County)

From 2005 to 2017, the City experienced a 19% increase in emissions from construction equipment and lawn and garden equipment. This increase in emissions is likely due to an increase in construction activity due to a strong local economy and an increase in housing. Table 13 shows the total GHG estimates from off-road sources.

Table 13: Total Annual Off-Road GHG Emissions in 2005 and 2017

	2005	2017
Construction Equipment	19,790	23,760
Lawn and Garden Equipment	1,090	1,180
Total	**20,880**	**24,940**

Source: SSF 2005 GHG Inventory Report and CARB OFFROAD2007 modeling tool (San Mateo County)

Greenhouse Gas Emissions Forecast

The emissions adjusted business-as-usual (ABAU) forecast for the City of South San Francisco is based on the demographic projections for the preferred land use plan for the General Plan update. These projections assume that the anticipated development is fully implemented by 2040. Table 14 shows the assumed demographic changes.

Table 14: South San Francisco 2040 General Plan Demographic Projections

Demographic Indicator	2005	2017	2040
Population	60,172	67,232	107,208
Housing Units	20,832	21,995	38,972
Jobs	42,240	56,093	105,723
Service Population	**102,412**	**123,213**	**212,931**

Note: Service population is the sum of population and jobs within the City.

The Adjusted Business as Usual (ABAU) forecast shows how South San Francisco's emissions are anticipated to change accounting for the impacts of adopted State climate-related policies if no action is taken at the local level. There are three major policies that the State has adopted to reduce community GHG emissions:

1. Renewables Portfolio Standard (RPS): This law requires that electrical utilities provide an increased amount of electricity from eligible renewable sources. SB 100 requires that 33% of electricity sold by utilities in 2020 be renewable, 60% be renewable in 2030, and 100% be carbon-free in 2045.
2. Title 24: Title 24 is the set of regulations that specifies how new buildings must be constructed, including specifying minimum energy efficiency standards. These standards are updated triennially to be more stringent. California has set a goal for zero-net energy new construction by 2030.
3. Pavely Clean Car Standards: These standards require that vehicles sold in California meet minimum fuel efficiency requirements, and that fuel sold in the state emits less GHGs during production and use

Based on the results of the ABAU forecast, emissions are expected to increase from 609,452 $MTCO_2e$ in 2017 to 706,280 $MTCO_2e$ in 2040. Table 15 shows the forecasted ABAU emission levels for each sector in future years and Table 16 shows the forecasted annual emissions per capita and per service population. The ABAU forecast illustrates the importance of supporting the State's climate targets to reduce emissions statewide and kickstart local actions.

By inventorying community-wide greenhouse gas emissions, the City of South San Francisco is taking an important step towards understanding its emissions profile. This emissions inventory provides the baseline of information necessary to evaluate greenhouse gas emissions reduction targets, to identify and implement key mitigation measures, and to monitor the effectiveness of South San Francisco's actions to reduce greenhouse gas emissions.

Table 15: Forecasted Adjusted Business as Usual Total Annual Community GHG Emissions in 2040 (in $MTCO_2e$)

Community Sector	2017	2040
Residential electricity	*17,500*	4,707
Residential natural gas	*40,370*	60,375
Nonresidential electricity	*76,420*	21,499
Nonresidential natural gas	*117,490*	178,817
On-Road Transportation	*268,787*	229,707
Landfilled Waste	*61,854*	82,947
Water Use	*2,092*	2,989
Lawn/Garden Equipment	*1,180*	2,037
Construction Equipment	*23,760*	41,024
Total	**609,452**	**624,102**
Change from 2017	**-**	**2%**

Table 16: Forecasted ABAU Annual Community GHG Emissions in 2040 Per Capita and Per Service Area (in $MTCO_2e$)

	2005	2017	2040
Total Emissions (MTCO2e)	517,757	609,452	624,102
Per Service Population	4.81	4.94	2.9
Change from 2017 per SP			-41%

GHG Reduction Targets

California's Regulatory Landscape

California has been a leader in climate action since early 2000. AB 32 set California's first GHG target to reduce emissions to 1990 levels by 2020. Greenhouse gas reduction targets can be defined as emission reduction levels that governments set out to achieve by a specified time. In this memo, the terms goals and targets are used interchangeably; however, the term "goals" is also used to refer to desired climate action achievements more broadly. California is on track to exceed its 2020 climate target, while the economy continues to grow. SB 32 extended the goals of AB 32 and established a mid-term 2030 goal of reducing emissions 40% from 2020 levels and a long-term goal of reducing emissions 80% by 2050. In 2018, Executive Order B-55-18 set the target of statewide carbon neutrality by 2045.

The reduction targets specified by the State are consistent with substantial scientific evidence published by the Intergovernmental Panel on Climate Change (IPCC) and the United Nations Framework Convention on Climate Change (UNFCCC) regarding the need to ultimately reduce global GHG emissions down to 80% below 1990 levels by 2050. This consistency is important for creating a "qualified" Climate Action Plan (CAP). The concept of having a "qualified" CAP means that a CAP meets the criteria specified in CEQA Guidelines Section 15183.5(b) for a plan for the reduction of greenhouse gas emissions, such that a "qualified" CAP may then be used for the specific purpose of streamlining the analysis of GHG emissions in subsequent projects. Local governments have discretion on what levels or targets are established in a "qualified" CAP, provided they are based on substantial evidence.

Furthermore, some GHG reduction measures applicable to new development can be implemented through codes, ordinances, or other rating systems. GHG reduction measures in a CAP that are determined to be applicable at the project-level and could be used for tiering by future projects should be specified as mandatory in the CAP (through building performance standards or building code requirements, for example), and not as voluntary measures that may not be enforced during development review. Ultimately, local agencies should put forth their best efforts to make sure that GHG reductions associated with the primary measures in a CAP are quantifiable and based on substantial evidence.

Recommended GHG Targets

Based on the review of the City's GHG forecasts and community input, there are four options for climate targets.

Option 1: South San Francisco adopts the goal of carbon neutrality by 2045. This target is based on Former Governor Brown's Executive Order B-55-18, which is likely to become law based on the State's current trends and actions around climate change. Many local jurisdictions have already adopted the goal of carbon neutrality including the cities of Fremont, San Luis Obispo, Sacramento, Menlo Park, and the County of Santa Clara. Furthermore, this target would create a stronger basis on which to qualify the CAP in terms of the California Environmental Quality Act (CEQA) and provide for future streamlining and tiering of projects. By 2040, the City would need to implement additional local climate action measures to reduce emissions to zero. Carbon neutral

by 2045 is the recommended option because it aligns the City with the State as well as its peer cities in the Bay Area and cities across California.

Option 2: South San Francisco adopts the State's emissions reduction targets set forth in SB 32. These targets include a mid-term and long-term goal of reducing GHG emissions 40% below baseline levels by 2030 and 80% by 2050. The City should adopt measures in their CAP that close the gaps in emissions between the ABAU forecast and SB 32 target emissions level by 2040. Table 17 shows the forecasted emissions gaps in 2040 for total and per service population that would need to be reduced using local climate action measures in order to meet the 2040 emissions reduction target.

Table 17: Forecasted Total and Per Service Population Annual 2040 Community GHG Emissions Targets (in MTCO2e)

		2040	2040 Goal
Adjusted Business-as-Usual Forecast	Total Emissions	624,102	-
	Per Service Population	2.9	-
SB 32 Emissions Gap (60% by 2040)	Emissions	297,915	**326,187**
	Per Service Population	1.1	**1.2**
B-55-18 Emissions Gap (80% by 2040)	Emissions	515,373	**108,729**
	Per Service Population	2.4	**0.5**

Option 3: Demonstrate leadership by setting a target in excess of State guidance. For example, carbon neutrality by 2035. This is a realistic goal for some cities that have access to 100% carbon-free and/or renewable electricity.

Option 4: Set a target that is less than the State's emissions reduction goals. For example, 50% reduction in baseline GHG levels by 2050. There is currently no requirement that the City match the State's climate goals and there are currently no repercussions for not meeting these targets. Although setting a lower target is an option available to the City, there are some drawbacks, and it is not recommended. If the City were to set GHG reduction targets less than those adopted by the State, the CAP would not be eligible for CEQA streamlining so responsibility would fall on individual projects to demonstrate that their mitigated impacts are in alignment with State GHG standards, which can be very burdensome, including for City projects.

It is recommended that the City adopt Option 1, the State's emissions reduction targets set forth in Executive Order B-55-18, which best positions it to adapt to future State climate guidance and regulations.

APPENDICES

B. Cost Estimate Data

Table 5: CAP Implementation Cost Estimates

	CAP Outcome	Cost to City	Cost to Individual	2040 GHG Reductions (MTCO2e)
Clean Energy	Local Solar Installations	$9,000,000 community solar	$1.72-2.77/W $ $17,538 to $23,458 10kW system[13]	–
	Clean Energy EcoPlus - PCE	$0.0054/kWh less than PG&E	$0.0056/kWh less than PG&E	–
Buildings	New Building Electrification		-$3,000 SFR $1,800 LRMF[16]	4,891
	Existing Building Electrification	$195,000-$275,000	$14,000-50,000/unit[18]	193,022
	Existing Building Energy Efficiency		residential: $3,750-4,000/unit (-$188.50/ton reduced) commercial: $206-232/kBTU/hr[19]	42,426
Transportation	EV Adoption	level 2 $400-$6,500 DCFC $10,000-$40,000[20]	$1,110-1,500 PCE reach code new construction $4,000-4,500 PCE reach code retrofit[21]	14,506
	Mode Shift	$400,000-1,000,000/year[22]		220,820
Solid Waste	SB 1383 Compliance	$135,000-240,000/year[23]		12,840
Water	Outdoor Water Use		$550-2,500 SFR laundry to landscape[24]	701
Sequestration	Trees	$1500-2000/tree planted[25]	$19-24/tree planted + cost of tree[26]	3,315
	Creek Restoration	$5,000,000+[27]		
	Carbon Farming	TBD		

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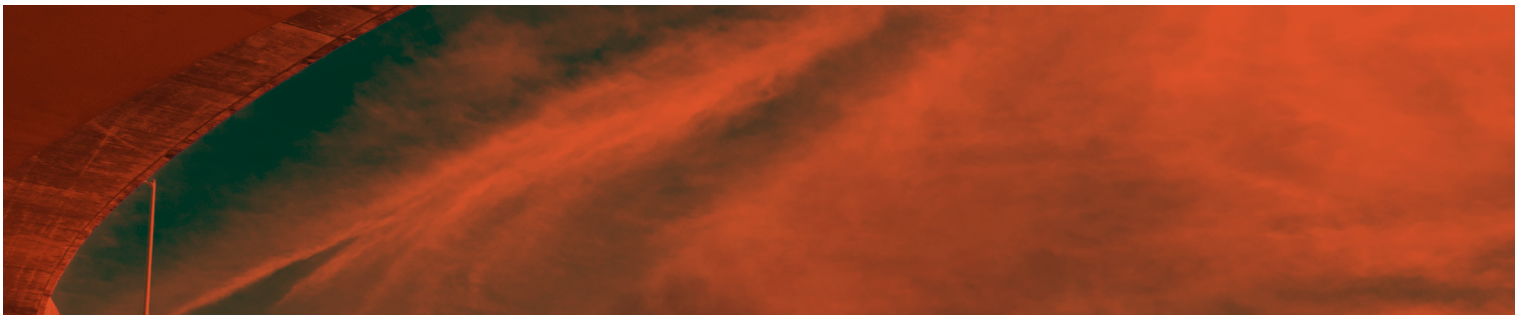

APPENDICES

C. GHG Reduction Analysis

Table 6: GHG Reduction Analysis

Strategy	Assumptions	Cumulative Participation Rate 2035	Cumulative Participation Rate 2040	Annual Participation	GHG Reductions 2030 (CEQA)	GHG Reductions 2035	GHG Reductions 2040
Buildings + Energy							
Existing commercial building electrification	**Voluntary:** assume 2.5% annual participation rate	67%	61%	210 buildings	*81,633*	119,431	196,281
Existing residential building electrification	**Mandatory:** assume 5% annual participation rate	70%	84%	1,550 homes	*36,124*	52,849	69,365
All-electric reach code	**Mandatory:** assume 100% participation	90%	90%		*5,015*	4,547	13,761
Existing building EE programs	**Voluntary:** assume 2.5% annual participation	67%	78%	770 homes 105 nonres	*44,487*	61,174	74,580
Benchmarking Ordinance	**Mandatory:** assume 100% participation of buildings over 10,000 sf	35%	32%	200 buildings	*357*	518	842
Maintain participation in PCE		96%	96%				
Transportation + Land Use							
EV adoption + Equipment Electrification	**Voluntary:**		50% of households	2020-2030 1,287 cars 2030-2040 650 cars	*42,411*	51,809	31,999
Mode Shift	**Voluntary:**	Carpool: 27.5% Transit: 9.5% Walk/Bike: 10%	Carpool: 26% Transit: 16% Walk/Bike: 13%		*-10,471*	74,704	125,959

Strategy	Assumptions	Cumulative Participation Rate 2035	Cumulative Participation Rate 2040	Annual Participation	GHG Reductions 2030 (CEQA)	GHG Reductions 2035	GHG Reductions 2040
Materials + Consumption							
Comply with SB 1383	**Mandatory:** compliance				*13,416*	14,918	18,877
Natural Systems + Water Resources							
Sequestration	**Voluntary**			900 trees + 20 acres carbon storage	*1,232*	1,801	3,315
Reduce Outdoor + Indoor Water Use	**Voluntary:** assume 2.5% annual participation	35%	50%	1,165 homes 165 nonres	*1,313*	1,147	701
Total Reductions (MTCO2e)					***215,244***	***382,534***	***535,001***
Forecasted ABAU emissions					***685,814***	***705,340***	***851,550***
Remaining ABAU emissions					***470,297***	***322,441***	***315,869***
2017 % Reduction					***-23%***	**-47%**	
1990 % Reduction					***-9%***	**-38%**	
Total Reduction							**-63%**

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2040 GENERAL PLAN

CITY OF SOUTH SAN FRANCISCO

CLIMATE ACTION PLAN