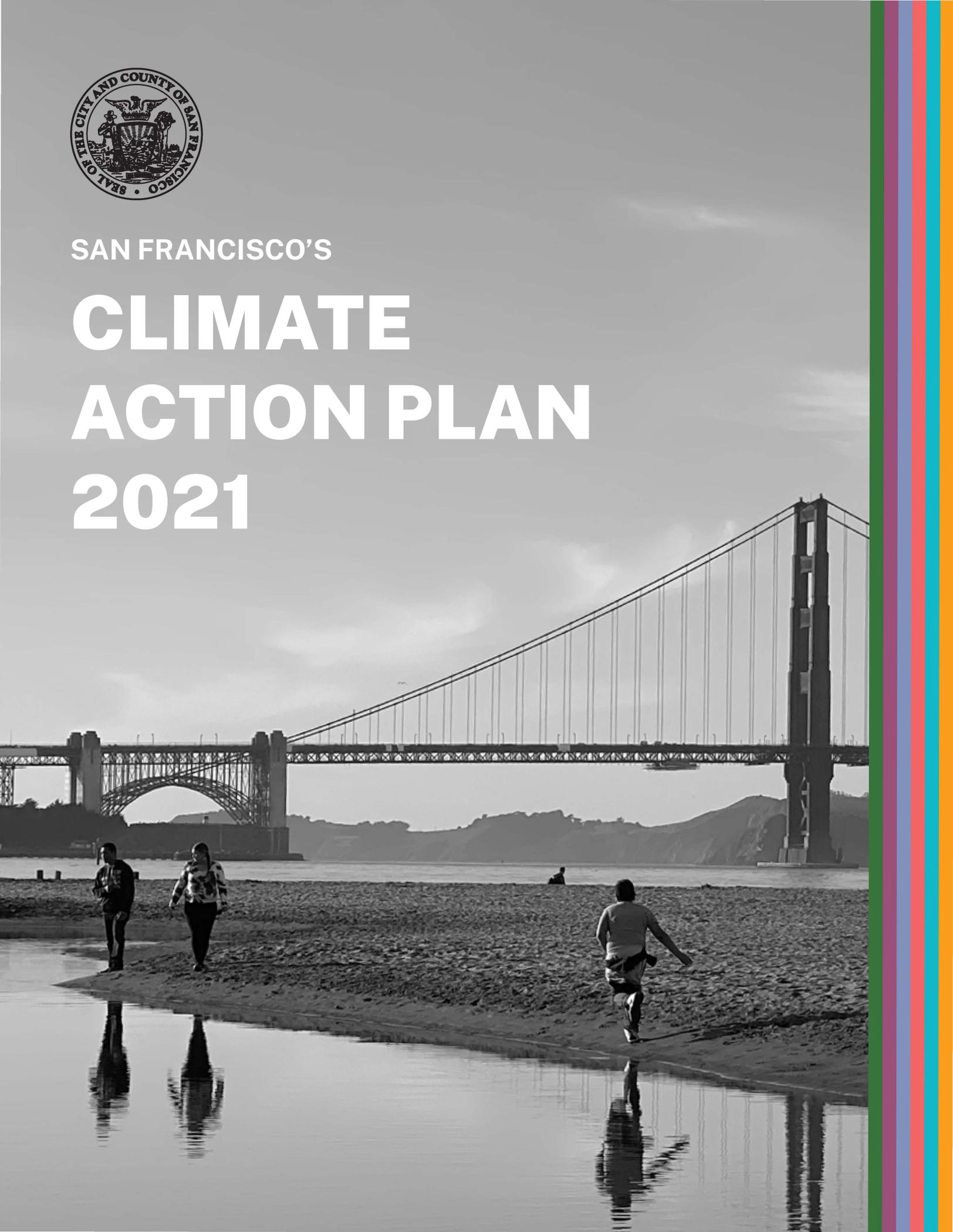




SAN FRANCISCO'S

CLIMATE ACTION PLAN 2021



ACKNOWLEDGEMENTS

The 2021 San Francisco Climate Action Plan (CAP) is the result of a multi-year process developed by the San Francisco Department of the Environment with support and collaboration from many individuals and institutions. We would like to sincerely thank all our colleagues, organizations, and residents who were generous with their time and ideas.



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MESSAGE FROM MAYOR LONDON N. BREED

In keeping with our role as a leader in sustainability, I am pleased to present the City and County of San Francisco's updated Climate Action Plan. Since adopting our initial Climate Action Plan in 2004, San Francisco has made great strides in reducing our greenhouse gas emissions. We have achieved this success by working with residents, community-based organizations, and businesses to use cleaner electricity, invest in energy efficiency, and recycle and compost more materials.

In the years since we created the first Climate Action Plan, we have seen marked consequences of a warming planet. Natural disasters like fires throughout California, dramatic hurricanes in the South, and devastating floods in the Midwest have exposed the massive human and economic toll climate-related disasters bring to our communities. These unfolding catastrophes demonstrate the need to accelerate our response to a changing climate — and to do all we can to mitigate the threat while preparing our City to be more resilient.

As of 2019, we have cut our emissions 41% below 1990 levels — reaching our goal six years ahead of schedule. Now we have a responsibility to keep moving forward, to reduce emissions by 61% below 1990 levels by 2030 and reach net-zero emissions by 2040. To reach these ambitious targets, we need to tackle climate change from all angles: housing, transportation and land use, energy, buildings, zero waste, and healthy ecosystems.

Climate change is one of our greatest challenges and meeting these new targets will not be easy. However, there is room for optimism. If our response to the COVID-19 pandemic has shown us anything, it is that when San Franciscans stand together, we can meet any challenge. I am proud of the courage we have shown. We listened to the scientists and took care of our most vulnerable neighbors. We had the drive to meet the pandemic head on and we will do the same in our ongoing response to climate change.

As we seek to reduce our emissions and reach net-zero, it is imperative that we advance climate action goals that will also build a more just, equitable society. One of San Francisco's greatest assets is our diversity, and the steps we take to address climate change must be rooted in equity and ensure that all our communities are supported throughout the transition to a climate-just future. While moving forward demands that we continue reducing emissions, strategies in this plan have multiple benefits for our most vulnerable communities — reduced asthma and respiratory illnesses, access to nature, housing security, and improved access to fresh food for all San Franciscans.

This Climate Action Plan was created with the input and feedback from a diverse cross-section of San Franciscans. Thank you to the thousands of residents, businesses, City agencies, and community institutions that gave their time to create this ambitious plan. We are grateful to have had the engagement of those with decades of experience on the front lines of the environmental movement. Now we must continue to work together to protect our communities, save our planet, and achieve a healthier, more just and sustainable future. I hope that you will join me in implementing this Climate Action Plan and adding to the collective courage required to create a future built on justice, equal opportunity, and environmental protection.



MESSAGE FROM DIRECTOR DEBBIE RAPHAEL

The 2021 San Francisco Climate Action Plan is the result of meticulous work and collaboration among City agencies, community members, local businesses, consultants, and international subject matter experts. The strategies outlined in this report present opportunities to ensure we continue building a city that serves all San Franciscans.

While we have made substantial progress in reducing our emissions, we know there is much more to do. In the last year, we have been asked to reckon with systemic racism built into our institutions while confronting a global pandemic. We have seen just how fragile our societal bonds can be. This past year has taught us that it is truly a moral imperative to create strategies that benefit all of us and our 2021 Climate Action Plan is grounded in equity and inclusion. It recognizes our combined power to ensure that no one is left behind as we deliver on our climate goals.

The Plan articulates strategies that get us to our goals of sending zero waste to landfills; making 80% of all our trips outside of our cars; powering our homes, vehicles, and businesses with 100% renewable energy; and drawing down carbon from the atmosphere. With its focus on equity, the Plan uses our climate goals to create more equitable housing and increase our green infrastructure to draw down carbon. It recognizes the tremendous strength in our communities and allows us to develop even more opportunities to drive implementation and create jobs.

And while it is exciting to see our federal administration stepping up and to witness the tremendous international commitment to climate action, we know that cities will continue leading the way to a carbon-free future. We are proud to join cities across the globe in taking responsibility for our greenhouse gas emissions.

I express my sincere appreciation to the residents, community organizations, city departments and businesses who participated in creating, guiding, and assembling this update. Join us in our commitment and lend your expertise to making sure San Francisco remains a vibrant and livable city for generations to come.



LAND ACKNOWLEDGEMENT¹

The Commission on the Environment acknowledges that we occupy the unceded ancestral homeland of the Ramaytush Ohlone peoples, who are the original inhabitants of the San Francisco Peninsula. We recognize that the Ramaytush Ohlone understand the interconnectedness of all things and have maintained harmony with nature for millennia. We honor the Ramaytush Ohlone peoples for their enduring commitment to wahrep, mother earth. As the indigenous protectors of this land and in accordance with their traditions, the Ramaytush Ohlone have never ceded, lost, nor forgotten their responsibilities as the caretakers of this place, as well as for all peoples who reside in their traditional territory. We recognize that we benefit from living and working on their traditional homeland. As uninvited guests, we affirm their sovereign rights as First Peoples and wish to pay our respects to the Ancestors, Elders and Relatives of the Ramaytush Community. As environmentalists, we recognize that we must embrace indigenous knowledge in how we care for San Francisco and all its people.

DISCLAIMER

This Climate Action Plan (CAP) articulates broad policy objectives to achieve equitable climate action. The CAP does not approve, fund, or authorize implementation of any specific projects. Each implementation project will be reviewed and approved over time and follow protocols and best practices for adoption, which may require additional public review, review by City decision-makers, and/or environmental review under the California Environmental Quality Act. As a result of those reviews, there may be alternatives and mitigation measures developed that may be implemented as well.

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SECTION 1:

EXECUTIVE SUMMARY



The consequences of a changing climate are all around us. Rising seas and extreme weather are creating increased flooding and more frequent heat waves, which inflict the most harm on the city’s most vulnerable populations. Reduced snowpack in the Sierra Nevada mountains is threatening the City’s water and hydropower supplies. Ever more destructive fires are polluting the air throughout the state and overwhelming its emergency resources and ability to respond to multiple disasters.

San Francisco, like cities around the world, is faced with the threat of a climate emergency, coupled with long-standing challenges of economic inequality and racial injustice. Local skies have turned orange from wildfires, fueled by decades of unchecked carbon pollution. The American economy is more precarious for working people than it has been in decades, with inequities exacerbated by COVID-19. Demands for action are growing louder, including calls for climate justice, racial justice, disability justice, and economic justice. The most recent [Intergovernmental Panel on Climate Change \(IPCC\) report](#), an international scientific assessment of the threats presented by climate change, was released in August 2021 and indicates that the window in which to act continues to shrink. The most important thing to limit the worst impacts is to rapidly reduce greenhouse gas (GHG) emissions, especially carbon dioxide and methane. This summer, Mayor London Breed sponsored legislation to address the urgent threat of climate change and set new, ambitious goals to slash GHG emissions in San Francisco and reach net-zero emissions by 2040.

While San Francisco is proud of its record on local climate action and pursuit of environmental justice, there is an opportunity to make San Francisco a more affordable, equitable, just and sustainable city for all. The window to avoid climate catastrophe is closing, but there is still time to act. There is an urgent need – and opportunity – to not only reduce emissions, but to build equity,

resilience, and opportunity for the entire city. Bold climate action must give everyone a seat at the table to create a more just society and ensure communities can thrive by guaranteeing clean air and access to good jobs, green space, and healthy housing, and by developing and implementing a shared vision of how to live better together in the face of the growing climate crisis.

LEADING ON CLIMATE ACTION

Since its first Climate Action Plan in 2004, San Francisco has been leading the way on local climate action, environmental justice, and launching innovative community programs and outreach campaigns for residents and businesses.

For decades, San Francisco has created plans, implemented policies, and crafted engaging frameworks to reduce emissions. As of 2019, the city has achieved a 41% reduction in emissions from 1990 levels, while its economic productivity as measured by gross domestic product (GDP) has increased by 199%, and its population has grown by 22%. Its emissions reductions have been driven primarily by cleaner electricity supply, improved energy codes, and city-wide energy efficiency. This progress has not just reduced emissions, but has also come with additional important benefits, such as cutting air pollution and limiting other environmental stressors.



Cities are rapidly growing across the world. Most people live in cities and the cities, in turn, create 70% of global emissions. This means cities have great responsibility and great potential for providing solutions. Further, cities are engaged in international diplomacy on climate change and as a respected leader on the world stage, San Francisco has a vital role to play in modeling climate action for cities around the world.

CLIMATE ACTION PLAN OVERVIEW

Net-Zero Emissions means cutting the overwhelming majority of emissions to zero while relying on biological and technological solutions and offsets to balance out remaining emissions

Tackling the interwoven climate, equity, and racial justice challenges we face has been the driving force for the development of this Climate Action Plan (CAP). It provides a summary of progress through existing programs, and a detailed list of priority actions that San Francisco can take that will have the greatest potential to reduce emissions, while also having the greatest potential to provide an equitable distribution of benefits. The process of creating the CAP brought City departments, residents, community-based organizations, and businesses together to craft a plan focused on science and equity and grounded in compassion and lived experience. This data-driven, community-based plan outlines a detailed list of strategies and actions to achieve net-zero emissions by 2040, while creating solutions that serve intersectional challenges of racial and social equity, public health, economic recovery, and resilient communities (Figure 1).

SAN FRANCISCO'S CLIMATE ACTION FRAMEWORK

Net-Zero Emissions Citywide By 2040
Racial, Social & Economic Equity

SECTORS

 RESPONSIBLE PRODUCTION & CONSUMPTION	 TRANSPORTATION & LAND USE	 ENERGY SUPPLY	 BUILDING OPERATIONS	 HEALTHY ECOSYSTEMS	 HOUSING
<p>GOALS:</p> <p>By 2030:</p> <ol style="list-style-type: none"> 1) Reduce solid waste generation 15% below 2015 levels 2) Reduce disposal to landfill 50% below 2015 levels 	<p>GOALS:</p> <ol style="list-style-type: none"> 1) By 2030, 80% of trips taken by low-carbon modes 2) By 2030, at least 25% of all vehicles registered in SF are electric, reaching 100% by 2040 	<p>GOALS:</p> <ol style="list-style-type: none"> 1) 100% renewable electricity by 2025, 2) 100% renewable energy by 2040 (no fossil fuels) 	<p>GOALS:</p> <ol style="list-style-type: none"> 1) Zero emissions new construction by 2021 2) All large commercial buildings are zero emissions by 2035 3) All buildings zero emissions by 2040 	<p>GOALS:</p> <p>Sequester residual emissions through nature based solutions</p>	<p>GOALS:</p> <p>Build at least 5,000 new units per year, with no less than 30 percent affordable, focus on rehab of existing housing</p>
<p>KEY AREAS:</p> <ul style="list-style-type: none"> Embodied carbon in materials Consumption of goods & services Diet & food waste Air travel 	<p>KEY AREAS:</p> <ul style="list-style-type: none"> Shift to low-carbon modes; align land use with climate and equity goals Advance electric vehicles 	<p>KEY AREAS:</p> <ul style="list-style-type: none"> Renewable electricity via Hetch Hetchy and CleanPowerSF Grid readiness and resilience Local clean energy jobs 	<p>KEY AREAS:</p> <ul style="list-style-type: none"> New construction Existing commercial Existing municipal Existing residential 	<p>KEY AREAS:</p> <ul style="list-style-type: none"> Soil health & sequestration Urban forest Ecosystem management & restoration 	<p>KEY AREAS:</p> <ul style="list-style-type: none"> Equity and affordability Production Preservation and rehab
<p>0</p>	<p>80</p>	<p>100</p>	<p>ROOTS</p>	<p>ALL</p>	

THE PATH TO REACH NET-ZERO BY 2040

The imperative to address climate change is simple: cut emissions as quickly as possible. But achieving these goals is complex and demands an integrated approach across society. San Francisco's approach to reaching net-zero emissions is first and foremost grounded in equity. The most significant consequences of climate change will be felt by Black, Indigenous, and People of Color (BIPOC) communities, people with disabilities, and other vulnerable populations. Climate action must also prioritize a just transition, which calls for a strategic, people-focused approach to phasing out polluting industries while creating employment pathways for workers in those industries and a new generation of workers to transition to quality jobs that support economic and climate justice. Further, communities that have been and will continue to be most harmed by climate change have not historically benefited from climate solutions in the past.

To advance climate justice, the CAP makes four core commitments:

- Build greater racial and social equity
- Protect public health
- Increase community resilience
- Foster a more just economy

By integrating these four climate justice commitments, the CAP proposes two ambitious and achievable climate emission reduction targets:

- An interim target of cutting sector-based emissions 61% below 1990 levels by 2030; and
- Net-zero sector-based emissions by 2040, a 90% reduction from 1990 levels

Sector-based emission inventories track traditional emissions in categories produced within municipal boundaries such as transportation, energy use in buildings, and solid waste. The City is beginning to account for the impacts of its "upstream" emissions, which include emissions from the consumption of services and goods produced outside San Francisco. In essence, these emissions are outsourced to other communities, generating harmful climate pollution and exacerbating environmental injustice. In keeping with its commitment to equity, San Francisco is determined

to reduce the impacts of these outsourced emissions and has set two targets:

- A 40% reduction in consumption-based emissions by 2030
- An 80% reduction in consumption-based emissions by 2050
- In total, the Climate Action Plan provides an innovative framework to reach its sector-based (Figure 2) and consumption-based emission targets, while also removing carbon from the atmosphere.

ENGAGING OUR DIVERSE COMMUNITIES

Led by the San Francisco Department of the Environment (SF Environment), crafting the CAP was a highly collaborative process, which engaged expert City staff, community-based organizations, residents, businesses, and other stakeholders to identify high-impact opportunities to reduce emissions and support equity. The CAP public engagement process brought together San Francisco residents with honesty, transparency, and respect. It reached hundreds of thousands of people through social media, websites, surveys, web-based workshops and presentations, and online open houses. Over the course of four months, SF Environment hosted a kick-off webinar with Mayor London Breed, which was followed by eleven public workshops, including in-language sessions in Spanish and Chinese, and eleven additional community presentations. Further, the Department received more than 1,400 comments on the online open house platform as well as nine emailed comment letters from different stakeholder groups. This process ensured the community could identify new actions and integrate their priorities, data, and best practices into the plan.

SAN FRANCISCO'S CLIMATE ACTION GOALS

BUILDINGS

By 2021, require zero onsite fossil fuel emissions from all new buildings; By 2035, require zero onsite fossil fuel emissions from all large existing commercial buildings and all buildings by 2040

'21

ZERO WASTE

By 2030, reduce solid waste generation by at least 15% and reduce the amount of solid waste disposed of by incineration or landfill by at least 50% below 2015 levels

TRANSPORTATION

By 2030, increase low-carbon trips to at least 80% of all trips and increase EVs to at least 25% of all private vehicles registered, and by 2040, increase EVs to 100% of all private vehicles registered

ROOTS

Sequester carbon through ecosystem restoration, including increased urban tree canopy, green infrastructure, and compost application

CLEAN ENERGY

By 2025, supply 100% renewable electricity, and by 2040, supply 100% renewable energy

HOUSING

Build at least 5,000 new housing units per year with maximum affordability, including not less than 30% affordable units, and with an emphasis on retaining and rehabilitating existing housing



PRIORITY SOLUTIONS

Through this robust engagement process the CAP identified 31 strategies (Table 1) and 159 supporting actions for San Francisco to achieve its climate and equity goals across six key areas, or sectors: Energy Supply, Building Operations, Transportation and Land Use, Housing, Responsible Production and Consumption, and Healthy Ecosystems.

Along with stakeholder input, key criteria used to inform the development of the strategies and supporting actions included their emissions reduction potential and their contribution to the four lenses of racial and social equity, public health, community resilience, and a just economy. While the CAP identifies hundreds of possible pathways needed to reach San Francisco's slated target of achieving net-zero emissions by 2040, not all have the same impact. The most critical stand-alone or subsets of strategies and actions have been summarized in the **top ten climate solutions:**

Energy Supply: Use 100% renewable electricity and phase out all fossil fuels

Building Operations: Electrify existing buildings

Transportation and Land Use:

- Invest in public and active transportation projects
- Increase density and mixed land use near transit
- Accelerate adoption of zero emission vehicles and expansion of public charging infrastructure
- Utilize pricing levers to reduce private vehicle use and minimize congestion
- Implement and reform parking management programs

Housing: Increase compact infill housing production near transit

Responsible Production and Consumption: Reduce food waste and embrace plant-rich diets

Healthy Ecosystems: Enhance and maintain San Francisco's urban forest and open space

Now that San Francisco has laid the foundation for a new, more inclusive climate agenda, it is time to move forward from planning to execution. New approaches will be needed to spur action across City departments and change underlying systems to embed climate considerations into municipal operations and ensure the timely delivery of projects.

TRANSPARENCY AND REPORTING

The CAP is not a "stand-alone" document. It leverages progress and momentum from complementary plans and policy initiatives, such as CleanPowerSF; building electrification code efforts; the [Housing](#) and [Transportation Element](#) updates of the General Plan; [urban forest](#) and [biodiversity plans](#); and [zero waste](#) work. These other plans and policies give the CAP a solid platform to help the city meet these pressing issues.

The CAP must and will be revisited and updated regularly, with a formal update every five years. Transparency is crucial for creating a plan that serves all San Franciscans. Further, the CAP is not just a summary of actions government will take on its own. Addressing climate change will require ongoing engagement with the entire community. Indeed, residents are parts of the implementation process too. To that end, the City will create a robust and accessible monitoring, evaluation, and reporting system to track and review the intended results and real progress of the targets, goals, strategies, and actions. This is essential to monitoring the success and effects of climate actions across the city, quantifying the benefits of the policies, and ensuring stakeholders can actively contribute to progress toward our climate goals.

TABLE 1: STRATEGIES IN 2021 CLIMATE ACTION PLAN

ENERGY SUPPLY (ES)	
ES 1	Supply 100% renewable electricity to residents and businesses.
ES 2	Invest in local renewable energy and energy resilience projects.
ES 3	Design and develop the reliable and flexible grid of the future.
ES 4	Develop workforce capacity to deliver clean energy resources.
ES 5	Plan for the equitable decommissioning of the City's natural gas system.
BUILDING OPERATIONS (BO)	
BO 1	Eliminate fossil fuel use in new construction.
BO 2	Eliminate fossil fuel use in existing buildings by tailoring solutions to different building ownership, systems, and use types.
BO 3	Expand the building decarbonization workforce, with targeted support for disadvantaged workers.
BO 4	Transition to low-global warming potential refrigerants.
TRANSPORTATION & LAND USE (TLU)	
TLU 1	Build a fast and reliable transit system that will be everyone's preferred way to get around.
TLU 2	Create a complete and connected active transportation network that shifts trips from automobiles to walking, biking, and other active transportation modes.
TLU 3	Develop pricing and financing of mobility that reflects the carbon cost and efficiency of different modes and projects, and correct for inequities of past investments and priorities.
TLU 4	Manage parking resources more efficiently.
TLU 5	Promote job growth, housing, and other development along transit corridors.
TLU 6	Strengthen and reconnect communities by increasing density, diversity of land uses, and location efficiency.
TLU 7	Where motor vehicle use or travel is necessary, accelerate the adoption of zero-emissions vehicles (ZEV's) and other electric mobility options.
HOUSING (H)	
H 1	Anchor BIPOC families and advance their return to San Francisco through robust housing and stabilization programs.
H 2	Support vulnerable populations and underserved communities through both the preservation and rehabilitation of existing housing and new housing development that serves their needs.
H 3	Advance zoning and implementation improvements that support new housing production sufficient to meet goals, especially sustainable, small, mid-sized, family, and workforce housing in lower density neighborhoods.
H 4	Expand subsidized housing production and availability for low-, moderate-, and middle-income households.
RESPONSIBLE PRODUCTION & CONSUMPTION (RPC)	
RPC 1	Achieve total carbon balance across the buildings and infrastructure sectors.
RPC 2	Reduce the carbon footprint of the food system by reducing waste, promoting climate friendly diets, and getting excess food to communities in need.
RPC 3	Promote reduction, reuse, repair, and recovery of goods and materials.
RPC 4	Lead the aviation sector by reducing emissions across the airline passenger journey.
HEALTHY ECOSYSTEMS (HE)	
HE 1	Advance citywide collaboration to continually refine nature-based climate solutions that sequester carbon, restore ecosystems and conserve biodiversity.
HE 2	Increase equitable community participation and perspectives in nature-based climate solutions, including meaningful efforts to prioritize Indigenous science and Traditional Ecological Knowledge.
HE 3	Restore and enhance parks, natural lands and large open spaces.
HE 4	Optimize management of the city's entire urban forest system.
HE 5	Maximize trees throughout the public realm.
HE 6	Maximize greening and integration of local biodiversity into the built environment.
HE 7	Conduct carbon sequestration farming pilot projects and research.

ACTION MOVING FORWARD

In addition to reducing emissions to net-zero over the next 18 years, the CAP strives to ensure all San Franciscans have the skills, knowledge, and resources to meet the challenges of climate change that lie ahead. Communication will be key to engaging businesses, residents, and communities in ongoing action and ensuring that all San Franciscans benefit from climate action. Climate change is inherently a complicated challenge: it encompasses major sectors of the economy, draws heavily on scientific research and data, merges private and public interests, and has outsized equity implications.

Funding the strategies and actions in the CAP is imperative for success. While the expected initial cost of implementing CAP strategies will be immense, research and the experience of cities already being confronted by climate change show that the financial consequences of inaction will be even worse.² In mid-2021, after strong advocacy from local residents inspired to act by the unfolding climate emergency, the City committed funding to develop high-level accounting of the cost of implementation and perform in-depth research and analysis to identify successful funding models to support implementation of the strategies included in this CAP.

The City must implement policies and creative financing mechanisms to provide ongoing and stable funding and build on support from the private sector and philanthropy, as well as federal, state, and regional agencies. It must continue to illustrate the case for climate action and secure commitments from a range of diverse stakeholders to invest in solutions, while creating incentives to support these investments. As a leader in global sustainability, San Franciscans have a chance to prove to the world that a net-zero future is achievable, advances justice, and creates a vibrant, diverse city where people can thrive.

A CALL TO ACTION

This path forward will be challenging. San Franciscans will need to be bold and courageous to achieve our vision of a city that provides adequate and healthy housing, safe transportation, green space in every community, and expansive employment opportunities. While individual action is important, including each City department, business, and resident working to reduce emissions, collective action will be vital. That includes rapidly getting off fossil fuels, understanding the science of climate change, and helping others grasp the magnitude of the threats to where we live, work, worship and play. Collective action includes listening to and learning from each other, lifting one another up to move forward together, and showing the entire world that San Francisco can lead the way in addressing the climate crisis.



THURSDAY NIGHT

OPEN TILL 9 PM

Asian Art Museum

Larkin

DON'T GET A POOL

THURSDAY NIGHT

THE

SECTION 2:

OVERVIEW



Over the past twenty years, cities around the globe have responded to the call for local action to address the climate crisis. This Climate Action Plan proposes focused solutions to eliminate greenhouse gas emissions while advancing related goals, such as racial and social equity, health, economic recovery, and resilience.

The climate crisis is putting San Francisco's communities at risk by directly threatening infrastructure, natural resources, and public health. While the City is proud of its record on local climate action, more needs to be done. The changes brought on by the global COVID-19 pandemic, growing economic inequality, and powerful calls for racial and social justice require a renewed vision for the city and a plan that responds to the scale of the crises we face, while leaving no one behind.

VISION AND VALUES

Time is running out. Climate change is accelerating as global emissions increase, causing havoc and destruction to every part of the globe. Transformational change is needed to rapidly cut emissions and limit further damage. San Francisco's future will be shaped by its response to climate change, as well as to other global crises such as the COVID-19 pandemic, systemic racism, and increasing income inequality. These interconnected challenges demand focused, flexible, and bold responses.

At the same time, scientific understanding of the climate crisis has deepened. In August 2021, the United Nations Intergovernmental Panel on Climate Change (IPCC) published the [first part of its sixth assessment report](#) which updates policymakers on our baseline understanding of

climate change. This sobering report unequivocally states human action is warming the planet, finds that many changes are already irreversible, and concludes that to stabilize the climate we must reach net-zero emissions to limit further warming. Now, more than ever, it is urgent that San Francisco take aggressive and equitable action to mitigate the catastrophic impacts of climate change.

Driven by these scientific and moral imperatives, San Francisco has embarked on a path to turn its climate challenges into opportunities and ensure that solutions work for everyone.

This need for a holistic approach is at the heart of San Francisco's response to climate change. The 2021 Climate Action Plan (CAP) charts a path to eliminate emissions while simultaneously committing to racial equity, social justice, health, resilience, and a just economy.

The CAP identifies actions to address inequities across sectors, including in housing and transportation. It supports communities that have been most impacted by climate change yet have not historically benefited from climate solutions. By centering racial equity and focusing on what matters most to San Francisco's diverse communities, implementing the CAP will create good jobs that are tied to meaningful work. The CAP also prioritizes sustainable economic recovery so that San Francisco can withstand crisis-level shocks while creating resilient, healthy, and equitable communities.

The CAP will shape San Francisco's response to the climate crisis for decades to come. Achieving this goal is not just up to scientists or the government; it will require active participation from everyone and therefore focuses on empowering communities to take action.

CHALLENGES IN UNPRECEDENTED TIMES

San Francisco's commitment to climate solutions must create opportunities that achieve sustainable and broad-based economic growth. The pandemic's impact on the economy has been severe, particularly harming the city's service and hospitality sector, commercial real estate, and public transit. COVID-19 also exposed significant racial and economic inequities, compounding existing income disparities.

While the COVID-19 pandemic is not expected to have a long-term direct effect on emissions, indirect effects will linger for years. In the transportation sector, these impacts might include less air travel and commuting as businesses rely more on telework, but such changes can also lead to less use of public transportation. In the commercial building sector, there are increased vacancies for office space, shops, and restaurants. This may result in less tax revenue, which could hinder the level of investment cities are willing to commit to climate action. At the same time, this may provide an inflection point for reimagining how we use these spaces for residents, communities, and other businesses.

Throughout the pandemic, San Francisco had to adapt quickly to circumstances and quickly implemented innovative new programs to protect public health and spur economic recovery. For instance, many streets were transformed into pedestrian-friendly, car-free recreational areas for people to safely exercise while keeping their distance. Neighborhood restaurants and cafes were allowed to create outside dining areas, an accommodation that will extend beyond the pandemic with the Shared Spaces program. While presenting challenges, these unprecedented times have also required a new way of thinking and shown that we need collective action to create a healthier and more sustainable future.

Implementation of pandemic solutions occurred quickly because of the urgency at hand. Similar urgency can apply to climate action, and inclusive implementation planning is also needed. As the prevalence and severity of climate changes grows, so does the need for awareness, diversity and inclusion.

CLIMATE ACTION: PAST, PRESENT, AND FUTURE

San Francisco is synonymous with environmental action. Its first Sustainability Plan in 1994 was prescient. That plan grappled with climate change and identified the need to assess the true costs of relying on fossil fuels. San Francisco was also one of the first cities to truly embrace the power of municipalities to effect change. In the face of decades of federal inaction on climate, it has bolstered its reputation as a leader in national and

international sustainability efforts such as the [Urban Sustainability Directors Network](#) and [C40](#), which bring cities from around the nation and the world together to share best practices and drive advancements in climate action.

In the more than two decades since its first environmental plan, the City has adopted progressively more ambitious policies to reduce emissions while simultaneously decoupling emissions from economic growth. Since 1990, San Francisco has reduced

emissions by 41%, while its population has grown by 22% and gross domestic product (GDP) has increased 199% (Figure 3), showing that environmental action can coincide with and even drive economic growth. While San Francisco's economy has grown, it has also seen some of the widest income disparities in the United States,³ exacerbating race and class divides that are evident in both the pandemic and environmental injustices.

1990-2019 San Francisco trends

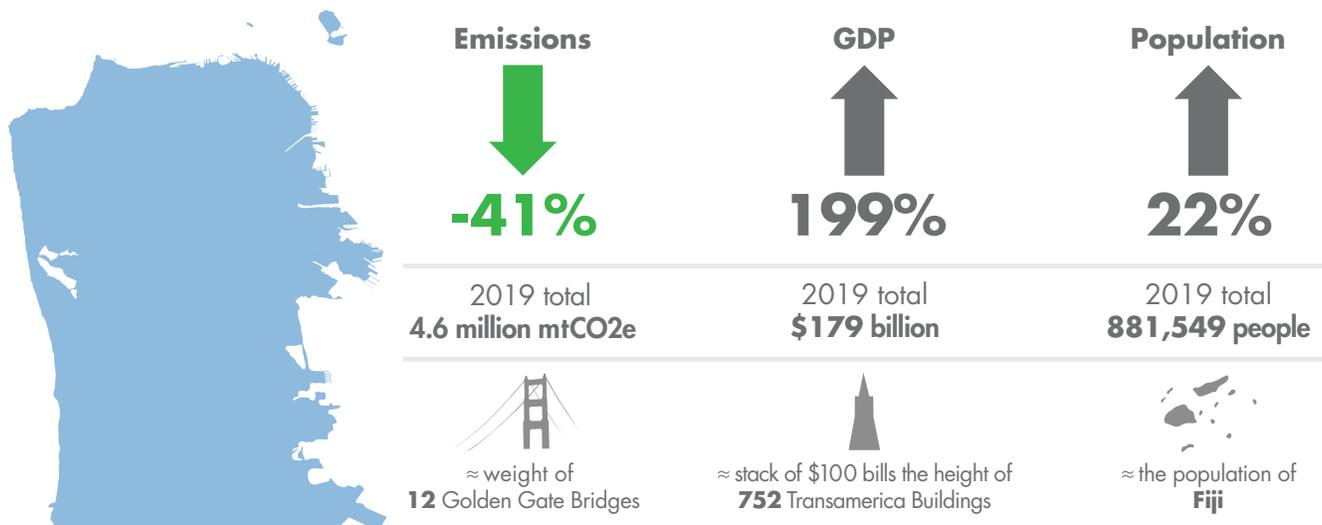


FIGURE 3: 1990-2019 SAN FRANCISCO GHG EMISSIONS AND GROWTH TRENDS

TABLE 2: SAN FRANCISCO'S KEY CLIMATE MILESTONES

YEAR	MILESTONE
2004	San Francisco's First Climate Action Plan
2013	San Francisco's updated Climate Action Plan
2015	0-50-100 Roots Climate Action Framework Launched
2016	Emissions Reduced by 30% Below 1990 Levels
2017	50% Low Carbon Trips Achieved - New Goals Set to 80%
2018	Mayor Breed Commits to Net-Zero Emissions by 2050
2019	San Francisco Board of Supervisors Declares a Climate Emergency
2019	100% Renewable Electricity Requirement for Large Commercial Buildings
2019	Emissions Reduced by 41% Below 1990 Levels (6 years ahead of schedule)
2020	Natural Gas Banned in New Construction
2021	Mayor Breed Advances Updates to Climate Action Goals in Chapter 9 of the Environment Code, Commits to Net-Zero Emissions by 2040, San Francisco Board of Supervisors Approves

Today, the country has a federal administration and Congress that are prioritizing climate action, but cities must continue to lead the way. For decades, San Francisco has created plans, implemented policies, and crafted engaging frameworks to address climate change and mitigate the impacts of air pollution and other environmental stressors. Table 2 shows some of key milestones that the City has assumed to meet its climate goals.

MAJOR CLIMATE IMPACTS

Burning fossil fuels has caused global temperatures to rise and weather to become more extreme. Today, global climate change is directly affecting San Francisco, including higher temperatures, more extreme heat days, more extreme storms with heavier rainfall and flooding, sea level rise, severe droughts, and poorer air quality. These conditions have left California susceptible to catastrophic wildfires, directly threatening homes, businesses, and protected areas,

and blanketing the city, state, many other parts of the nation with hazardous smoke.

Climate change has both direct and indirect consequences. Direct consequences lead to health and economic challenges such as heat stroke, injuries from extreme storms, and respiratory illness from poor air quality. Indirect downstream consequences include food insecurity caused by poor agricultural output; income and property loss; housing and job insecurity due to drought, flooding and wildfires; and increased rates of anxiety and depression because of these disruptive consequences of climate change.

Table 3 summarizes historic and future direct climate impacts out to the late century.⁴ It is difficult to predict the exact increase in future emissions and the climate's response to specific emissions levels. This table highlights projected climate impacts from three scenarios.

Climate Impact Spotlight: Droughts

Climate change projections indicate that droughts will intensify in many areas of the United States in the 21st century. Already, historic drought conditions in California are necessitating mandatory water restrictions for residents, businesses, and farms. Several consecutive years with little precipitation and low snowpack have left all of California's reservoirs significantly under capacity, and vegetation dry and highly combustible. Drought conditions such as low precipitation and high temperatures impact air quality by extending the blooming season for ragweed and other allergens, increasing exposure to ground-level ozone and fine particulates, and greatly increasing the likelihood of catastrophic wildfires that spread extremely unhealthy smoke to adjacent communities. These impacts exacerbate respiratory illness, allergies, and asthma and will be worse for children whose developing lungs and rapid breathing increases exposure to respiratory triggers. San Francisco must invest significant resources to prepare for the multiple threats posed by droughts and their harmful effects.

TABLE 3: MAJOR CLIMATE IMPACTS

HAZARD	HISTORICAL PATTERN	LATE CENTURY (2070 - 2099)	
	Observed 30yr Average (1961-1990)	Medium Emissions Scenario (RCP4.5) ⁵	Very High Emissions Scenario (RCP8.5) ⁶
 Extreme Heat⁷ Days	4 days	30-year average: 6 days / year 30-year range: 4-11 days / year	30-year average: 12 days / year 30-year range: 6-28 days / year
 Maximum Length of Dry Spell⁸	111 days	30-year average: 118 days 30-year range: 95-136 days	30-year average: 123 days 30-year range: 96-153 days
 Maximum 1-Day Precipitation	1.695 inches	30-year average: 1.741 inches 30-year range: 1.440-2.094 inches	30-year average: 1.814 inches 30-year range: 1.408-2.335 inches
 Sea Level Rise⁹	BASELINE YEAR	END OF CENTURY (2100)	
	2000	Low Emissions Scenario (RCP2.6) ¹⁰	Very High Emissions Scenario (RCP8.5)
		66% probability sea-level rise is between 1.0-2.4 ft 5% probability sea-level rise meets or exceeds 3.2 ft	66% probability sea-level rise is between 1.6-3.4 ft 5% probability sea-level rise meets or exceeds 4.4 ft

SAN FRANCISCO'S APPROACH

Communicating About Climate Change

Climate change encompasses major sectors of the economy, draws heavily on scientific research and data, merges private and public interests, and has outsized equity implications. Effective communication will be key to achieving the City's climate action goals and ensuring that all San Franciscans can participate and benefit.

Climate action must therefore be multi-dimensional: it must be bold and science-based; it must be explicitly anti-racist and move society toward a more just and equitable world; it must embody shared values of mutual aid, support and protection; it must speak to diverse communities in languages that are their own, and amplify the voices of communities that have been historically disenfranchised; and it must lift up communities on the front lines of climate harm, many of which are among the least responsible for climate emissions and least resourced to respond.

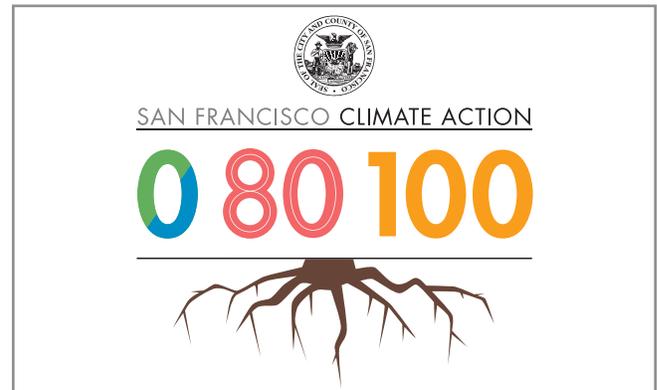
Since its first CAP in 2004, San Francisco has been leading the way on local climate action, environmental justice, and developing and implementing innovative community-facing programs and outreach campaigns to engage with community stakeholders from all walks of life. Transparent [annual reporting](#) of community-wide emissions shows that the City has stayed ahead of targets set by the State of California and included in international climate protocols.

The 2013 CAP summarized the city's progress and shared examples of successful policies and programs and outlined an initial set of actions to be taken by citizens, businesses, and government to strive toward emission reductions. Several years later, San Francisco introduced the "0-80-100-Roots" climate action framework, where:

- 0 stands for zero waste to landfills and incineration, and zero toxics
- 80 stands for 80% of trips taken by low-carbon modes such as walking, biking, and transit
- 100 stands for 100% renewable energy and a complete phase out of fossil fuels, and

- Roots means using natural systems to sequester carbon from the atmosphere

As the dangerous consequences of climate change continue to harm people, it is important for San Francisco to deploy new communication tools and approaches that will increase community resilience in the face of challenges that lie ahead. An educated and



committed public will be vital to participating directly in solutions as well as building and maintaining the political will to enact climate policies.

CAP Development Process

Given the urgency of the climate crisis, any CAP must prioritize actions that will have the greatest potential to reduce emissions and a strong likelihood of realization. In April 2019, the Board of Supervisors passed the [Climate Emergency Resolution](#) which called on SF Environment to issue a technical feasibility analysis, the [Focus 2030 report](#), released three months later. Afterward, SF Environment outlined a process for updating the 2021 CAP. Early activities included: identifying partners, developing governance structures, identifying future technical tasks such as emissions impact analyses, conducting targeted stakeholder engagement, and preparing for general coordination for the many aspects of the CAP. This was initiated as the COVID-19 pandemic unfolded.

From there, the CAP update process followed the steps outlined below:

1. **Follow the Data** – The annual emissions inventory and supporting data serve as the foundation for identifying key focus areas for emissions reduction. Additionally, the city's Consumption-Based Emissions Inventory (CBEI), which expands

the inventory process to address other sources of emissions, was also analyzed and used to inform the development of “Responsible Production and Consumption” strategies.

2. **Build on Experience** –With a history of administering credible and effective sustainability and climate programs over the past 20 years, San Francisco enjoys a high level of expertise for implementing climate strategies. Leveraging and growing from this experience will accelerate emissions reductions. However, given more ambitious goals driven by the unfolding climate emergency and the need to center equity in planning and implementation, new approaches will be needed and they must be responsive to today’s challenges and opportunities.
3. **Center Equity** –In addition to eliminating emissions, equity is a co-equal priority for the CAP. To support transparency and rigor, SF Environment created the Racial and Social Equity Assessment Tool (R-SEAT) especially for the CAP, which is discussed in depth in **Section 4: Planning for People**, as well as in **Appendix D: R-SEAT Summary Findings**. SF Environment also launched the Community Climate Council, composed of leaders from key community organizations including the American Indian Cultural Center, Business Council on Climate Change, Chinatown Community Development Center, Community Youth Center, El Centro Bayview, Emerald Cities, Interfaith Power and Light, Livable City, PODER, Sutro Stewards, and SPUR. Members were convened and compensated to advise on the CAP and the best methods for reaching the city’s diverse population. SF Environment also outlined various methods to ensure a range of voices could contribute to the CAP.
4. **Leverage Complementary Efforts** –The extent of the climate emergency means all complementary efforts must be leveraged to their fullest extent. The CAP leverages many other plans and policy initiatives. Examples include the growth of CleanPowerSF; building electrification codes; [ConnectSF](#), San Francisco’s long range transportation plan and pricing studies;



Anchor Partner Network Meeting on Equitable Decarbonization of Affordable Housing, Fall 2019

the [Electric Vehicle Roadmap](#); [Housing and Transportation](#) element updates of the General Plan; [urban forest](#) and [biodiversity plans](#); and ongoing [zero waste](#) efforts.

5. **Convene and Engage** -SF Environment convened Technical Working Groups (TWGs) composed of staff from key City departments who contributed significant time, creativity, and knowledge to the process. The department and partner agencies also implemented various forms of targeted stakeholder engagement. This engagement included the Transportation and Land Use sector focus groups, recurring updates to policy bodies such as the Urban Forest Council, and convening the Zero Emissions Buildings Task Force, which included the Anchor Partner Network, a focused process to identify equity priorities for residential building decarbonization.
6. **Draft Initial Strategies and Analyze Impacts** – TWGs and key stakeholders identified high-impact opportunities to reduce emissions, informed by a mix of existing department goals and opportunistic leverage points. Based on early drafts, preliminary emissions reductions for buildings and transportation, comprising approximately 90% of total emissions, were calculated. Throughout the process the R-SEAT was applied to surface and sharpen equity priorities. Other data, such as high-

FREE ONLINE WORKSHOPS

WED, JAN 27	CLIMATE & ECONOMY
5:30-7:00 pm	with Alvaro Sanchez The Greenlining Institute
TUE, FEB 2	CLIMATE & EQUITY
6:00-7:30 pm	with Jacqui Patterson NAACP
TUE, FEB 9	CLIMATE & HEALTH
5:30-7:00 pm	with Linda Rudolph Public Health Institute
THU, FEB 18	CLIMATE & RESILIENCE
5:30-7:00 pm	with Brian Strong City and County of San Francisco

FEB 23 & 25
SAVE THE DATES
 for Spanish and Chinese
 in-language workshops!

SAN FRANCISCO CLIMATE ACTION | **0 80 100**ROOTS | SFEnvironment.org/climateplan

CAP Community Engagement Outreach Flier, January 2020

level costs, feasibility, and capacity to implement, were also documented.

Following this phase, a broad-based community engagement process was implemented.

Community Engagement

After developing draft strategies, the public engagement process was initiated to 1) inform residents about the proposed strategies, including how equity was incorporated; and 2) consult residents to identify missing elements and get ideas for implementation. Detailed information about the community engagement process can be found in **Appendix B**.

To ensure the CAP serves the needs, goals, and preferences of its constituents, SF Environment sought the participation of a diverse cross-section of the public, including communities of color, neighborhood and tenant groups, youth, workers, and seniors. Multilingual staff supported a specialized consultant team to engage with non-English-speaking residents. Further, the Department relied on members of the Community Climate Council to provide additional culturally competent outreach and engagement.

This process was conducted from mid-December 2020 to the end of March 2021, during the height of the pandemic. New approaches were needed, and innovative uses of digital technology were deployed to reach as many San Franciscans as possible, with a strong commitment to connect with traditionally underrepresented populations and fostering an open and engaging atmosphere for all attendees. In February 2021, workshops started offering American Sign Language interpretation and specific outreach was conducted to the Mayor’s Disability Council and The California Aging and Disability Alliance.

Overall, the engagement process reached 238,845 people, including those who saw social media posts or visited the website. Ultimately 5,777 people took at least one of the following actions: filled out the online survey, attended a virtual workshop or presentation, provided comments on the online open house platform, or interacted with social media content. Additionally, SF Environment hosted a kick-off webinar with Mayor Breed, followed with 11 public workshops (including one in Spanish and one in Chinese), and 11 community presentations. More than 1,400 comments were posted



to the online open house platform, and nine emailed comment letters were received from stakeholder groups. City staff addressed major themes of the comments and feedback received and integrated the changes into the final CAP.

A summary of major themes and community priorities captured from the engagement process include:

- **Evidence-based Efforts** –Provide rigorous, transparent, and consistent analyses to show potential effectiveness of actions, and ensure implementation does not inadvertently increase emissions or exacerbate inequities.
- **Cost Burdens** –Community members expressed concerns about the affordability of climate action and who will have to pay costs. Lack of affordable alternatives to a fossil fuel-based economy is a major potential barrier to success.
- **Balance of Agency** –There is desire for more education and outreach to empower communities. The onus for climate action should be on major institutions, including the government and corporations, not individuals.

- **Alignment** –The City should prioritize existing relevant projects or clarify how the CAP would interact with these policies and programs for a more holistic approach.
- **Workforce** –There is desire to see the City further supporting workforce development within local, low-income, and BIPOC communities.

The CAP must be viewed as a living document that will be revisited and updated regularly moving forward based on external factors, with a formal update every five years, all in acknowledgement of rapidly changing times. Progress on CAP strategies will be tracked through climate and equity metrics. Draft metrics are proposed in **Section 5: Solutions: A Path Forward.** Outreach and engagement will be imperative to success and will continue throughout implementation (see **Section 6: Next Steps for Implementing the CAP**, for more on this).

SECTION 3:

TOWARDS A NET-ZERO FUTURE



The science is clear: the planet is warming, primarily due to burning fossil fuels and destroying tropical forests. Emissions inventories provide a quantifiable means for measuring progress toward reducing emissions over time. This section includes: **(1) Current emissions profiles** - San Francisco's current emissions inventory, baseline, and historical data; **(2) Emission reduction pathways** - a forecast business-as-usual (BAU) inventory and inventory projections; and **(3) Emission targets and climate goals** - specific targets and goals for emission reductions.

CURRENT EMISSIONS PROFILE

The City of San Francisco's most recent sector-based emissions inventory is for the year 2019. The major sources of emissions are those generated by energy consumption from buildings, transportation, and water/wastewater management. Energy-related emissions are those generated by electricity use and burning natural gas. These emissions are primarily from consumption that occurs within residential and commercial buildings as well as municipal activities. Transportation emissions include burning gasoline or diesel fuel for vehicle travel and equipment use. Emissions from landfills come from decomposition of organic materials that produce methane, a powerful heat-trapping gas. Emissions from agriculture are allocated to the city proportionally from the Bay Area Air Quality Management District's regional inventory.

San Francisco's emissions are categorized into five sectors in the 2019 inventory (Figure 4): Transportation, Buildings (Residential and Commercial), Landfilled Organics, Municipal, and Agriculture and Wastewater. San Francisco's baseline inventory is set to 1990 levels and serves as a reference against which progress in reducing emissions over time may be measured. The 1990 level baseline inventory year is consistent with the State of California.

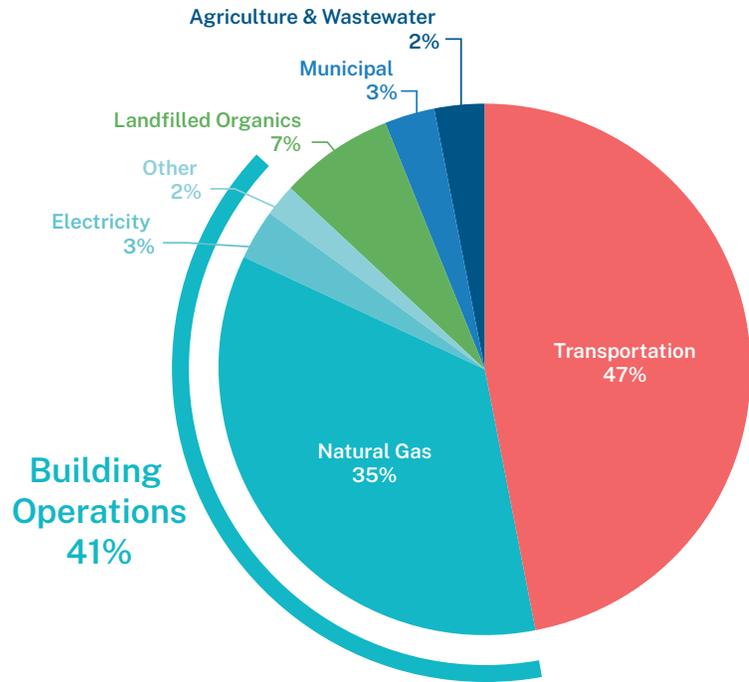


FIGURE 4: SAN FRANCISCO'S 2019 GHG INVENTORY

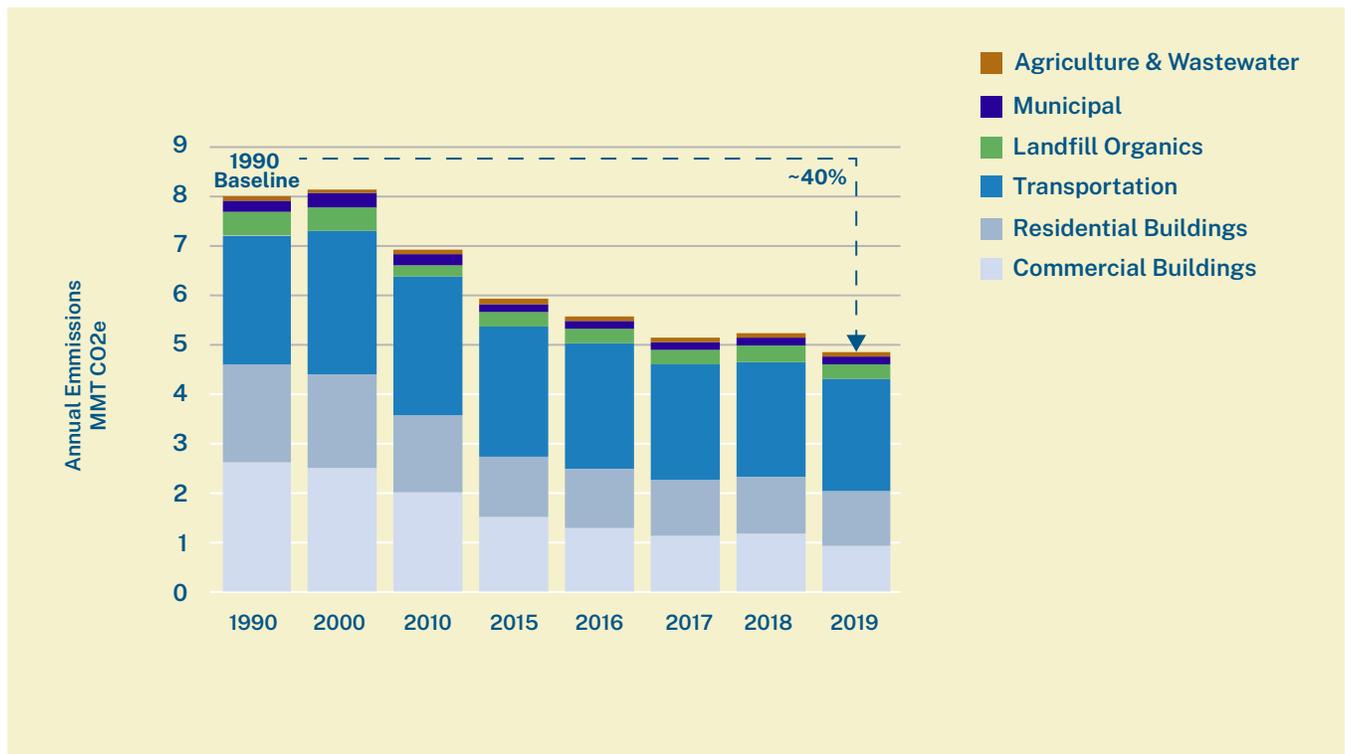


FIGURE 5: EMISSIONS: BASELINE (1990) TO CURRENT DAY (2019)

TABLE 4: 2019 EMISSIONS COMPARED TO 1990 LEVELS

SECTOR	PERCENT CHANGE FROM 1990
Residential Buildings	47% decline
Commercial Buildings	67% decline
Transportation	16% decline
Landfilled Organics	35% decline
Municipal	32% decline
Agriculture	9% increase
Wastewater	26% increase

San Francisco's emissions declined by 41% between 1990 and 2019, from 7.9 to 4.6 million metric tons of carbon dioxide (mtCO₂e¹¹) (Figure 5). San Francisco has consistently seen decreases in almost every sector (Table 4).

Transportation: In 2019, emissions in the Transportation sector totaled 2.20 million mtCO₂e, accounting for 47% of San Francisco's emissions. Emissions from the Transportation sector have declined 16% below 1990 levels, mainly due to lower vehicle pollution and cleaner vehicle fuels mandated by the State of California. Emissions from public transportation, such as Muni and commuter ferries, have fallen as fossil-fuel diesel has been replaced by renewable diesel starting around 2016. Gasoline used by the Transportation sector was responsible for the largest share of emissions (72%), followed by diesel (21%), other fuels (6%), electricity (1%), and renewable diesel (<1%). Broken down by vehicle type, privately-owned passenger vehicles generated 72% of emissions, at 1.59 million mtCO₂e. Maritime ships and boats accounted for 19% of emissions and off-road equipment produced 6% of emissions. The remaining 3% of sector emissions were from public transportation.

Buildings: In 2019, emissions from the Building sector totaled 2.02 million mtCO₂e, accounting for 41% of San Francisco's emissions. Of these, emissions from Residential buildings totaled 1.05 million mtCO₂e, comprising 23% of San Francisco's emissions.

Emissions from Residential buildings have declined 47% since 1990 — driven primarily by cleaner electricity supply, improved energy codes, and city-wide energy efficiency programs. Residential sector emissions are

generated from fossil fuels used to heat households, provide hot water, dry clothes, and cook. They result primarily from burning natural gas (96%), followed by electricity use (2%), and other fuel consumption (2%).

In 2019, emissions from the Commercial buildings sector totaled 831,000 mtCO₂e, accounting for 18% of San Francisco's emissions. This includes commercial and industrial, direct access, district, and steam loop customers. Emissions from the Commercial sector have declined 67% since 1990. Like Residential buildings, this decrease was mainly due to a combination of cleaner electricity supply, improved energy codes, and city-wide energy efficiency programs. Commercial natural gas use was responsible for the largest share of emissions (85%), followed by steam (8%), and electricity (7%).

Landfilled Organics: In 2019, emissions from Landfilled Organics totaled 308,000 mtCO₂e, accounting for 7% of San Francisco's emissions. Organic materials sent to landfills decompose and release methane emissions. Emissions from Landfilled Organics have declined 45% below 1990 levels due to improved resource recovery.

Municipal: In 2019, emissions from the Municipal sector totaled 156,000 mtCO₂e, accounting for 3% of San Francisco's total emissions. In the Municipal sector, 86% of emissions were generated from City-owned buildings and 14% from the City's fleet of non-revenue vehicles. Municipal sector emissions declined 31% below 1990 levels. The steepest decline occurred between 2010 and 2012 when all City-owned buildings began to fully source 100% emission-free electricity generated by San Francisco Public Utilities Commission's Hetch Hetchy Power system.

Agriculture: In 2019, emissions from the Agriculture sector totaled 84,000 mtCO₂e, accounting for 2% of San Francisco's emissions. These emissions have increased 9% from 1990 levels and are generated mostly from animal waste, with the remainder from managing urban soils.

Wastewater: In 2019, emissions in the Wastewater sector totaled 5,400 mtCO₂e, accounting for just one tenth of a percent of San Francisco's emissions. Wastewater sector emissions have increased 26% from 1990 levels, mainly due to a 22% increase in population, which increases the volume of wastewater treated at

the City's water pollution control plants. Wastewater sector emissions occur mainly from fugitive emissions, or emissions that are released as effluent is discharged into a body of water.

EMISSIONS REDUCTIONS PATHWAYS

Global

In 2016, the IPCC estimated that to remain under a 1.5°C increase in average global temperature CO2 emissions would need to fall by 45-75% from 2010 levels and cumulative global emissions after the end of 2017 must be less than 420 GtCO2. In 2018, scientists prepared a subsequent report to document progress towards long-term goals of the Paris Agreement and inform preparation of nationally determined contributions. The report found that limiting global temperature increase to 1.5° C would require rapid transitions in energy, transportation and land use, industry, and buildings. It notes that global net human-caused emissions must reach net-zero around 2050, which means remaining emissions will need to be balanced through carbon sequestration. Global organizations such as [C40](#) and One Planet City Challenge (OPCC) provided specific guidance for cities based on these IPCC reports, and recommended a 57%-68% reduction from baseline emissions inventories to meet a global 2030 target.

In August 2021, IPCC released its latest report, documenting the most up-to-date and comprehensive review on the science and expected impacts of climate change. The report states that humans are unequivocally responsible for global warming and that human-induced climate change is already affecting many weather and climate extremes in every region across the globe. Unless there are immediate, large-scale emissions reductions, it will be impossible to limit warming to close to 1.5°C. While the IPCC's synthesis of regional information will not be published until September 2022, it has released a [fact sheet](#) highlighting findings for urban areas. Cities, especially coastal cities, will be hotspots of global warming.

State of California

In 2018, Governor Jerry Brown signed a non-binding executive order (B-55-18) which ordered, "A New Statewide Goal to be established to achieve carbon neutrality as soon as possible, and no later than 2045." At the same time, Senate Bill (SB)100 was signed into law requiring 100% of the state's electricity to be produced by zero-carbon resources by 2045. The law addresses the electricity portion of the State's emissions but does not address vehicle fuels and natural gas.

Currently, the California Global Warming Solutions Act of 2016: Emissions Limit, or SB 32, is a state law that codifies statewide emissions reduction targets to 40% below 1990 levels by 2030. SB 32 expanded upon Assembly Bill 32, which was passed in 2006 and established statewide goals to reduce emissions to 1990 levels by 2020.

The State of California has concurred that limiting global warming will require a 45% reduction in global emissions from 2010 levels by 2030 which is proportionate to the State's goal of a 40% reduction from 1990 levels by 2030 and reaching net-zero emissions by mid-century. The State is currently evaluating a pathway to achieve net-zero emissions by 2045.

In October of 2020, the California Air Resources Board (CARB) consulted with Energy + Environmental Economics to develop [Achieving Carbon Neutrality in California – PATHWAYS Scenarios Developed for the California Air Resources Board](#). This study evaluated three scenarios that could potentially achieve carbon neutrality in California by 2045 and was designed to align with California's Executive Order B-55-18. Analysts examined carbon neutrality differently in each scenario, ranging from 80-92% reduction in emissions by 2045, with remaining emissions being removed from the atmosphere using a combination of carbon sequestration strategies.



San Francisco, CA

It is clear that San Francisco's response to the climate crisis must be swift and acknowledge the imperative of accelerating emissions reductions. In February 2019, San Francisco's Board of Supervisors approved a resolution declaring a climate emergency and directed SF Environment to issue a report detailing the steps San Francisco can take to reduce its carbon emissions. In July 2019, SF Environment released *Focus 2030: A Pathway to Net-Zero Emissions*, which was a foundational step in San Francisco's progress toward addressing the climate crisis. This technical report quantified potential emissions reductions consistent with reaching a net-zero goal.

Building upon the *Focus 2030* report to meet reduction targets, additional analysis was conducted to develop comprehensive understanding of the emissions reduction potential of various strategies and actions to achieve those targets.

A business-as-usual (BAU) baseline scenario was created to project the effect of emissions reduction strategies. The BAU assumptions, in which demographic and economic changes — namely population and job growth — serve as the primary drivers of changes in emissions, resulted in a scenario that showed emissions steadily increasing over time, rising 21% above 2017 levels. Continuing with business-as-usual is not an option if San Francisco is serious about meeting its climate commitments and avoiding the worst consequences of climate change.

From this baseline, a variety of emissions-reducing strategies and actions are applied to San Francisco's emissions forecast. These are described in **Section 5**. Details about the methods used for the Transportation and Land Use and Building Operations sectors are in **Appendix C**. Emissions reduction approaches vary in the targeted sectors. Local city data and applicable sector decarbonization rates were used to provide tailored analyses to understand emission reduction potential.



Photo Credit: C Matt Jalbert

San Francisco's emissions reduction target:

Net-zero sector-based emissions by 2040

Based on prior commitments, the CAP development process originally contemplated net-zero emissions by 2045 as the overall target. More recently, legislation sponsored by Mayor London Breed that updated Chapter 9 of the Environment Code accelerated the net-zero goal to 2040 and it also specifies net-zero as a 90% reduction below San Francisco's baseline year of 1990.

Current projections show that if all the strategies in the CAP were implemented based on the specified timelines, San Francisco would see an 80% reduction from 1990 levels by 2040, an 87% reduction by 2045, and a 94% reduction by 2050.

Peer review by external technical experts concluded the CAP puts forth an exhaustive set of strategies, and indicated that the main way to achieve the 2040 net-zero goal would be to accelerate implementation. Staff-led technical working groups concluded that the proposed strategies had considered aggressive implementation timelines, and any further acceleration would be possible only with significant assistance and support from external entities. Initial solutions to the projected 2040 shortfall include: receiving large amounts of heavily subsidized capital from non-city sources, aligned transformative policies from the state and federal government, and tapping into new science and tools to quantify the carbon sequestration effects of Healthy Ecosystems strategies, which are currently not accounted for within the emissions reduction projections. These are discussed in more detail in **Section 6: Next Steps for Implementing the CAP.**

If San Francisco successfully implemented all CAP strategies and actions, the City would achieve a 61% reduction in emissions by 2030 and an 87% reduction by 2045. More aggressive reductions by 2030 are challenged by the need for legislation and differing regulatory, financial, social, and equity considerations that must be developed in partnership with stakeholders. Major shifts are beginning to happen, as innovation and capital investment in climate technologies are on the rise, while securing new long-term funding and vigilantly prioritizing climate justice are also needed for success. Based on this data, analysis, and consideration of external factors, San Francisco has proposed the bold and aggressive goal of equitably reaching net-zero sector emissions by 2040, with a 61% reduction by 2030 (Figure 6).

To expand San Francisco's view of emissions, a Consumption-Based Emissions Inventory (CBEI) was conducted for the years spanning 1990–2015 by SF Environment in partnership with Lawrence Berkeley Lab's CoolClimate Network in April 2019. The results were released in October 2020. One recommendation from that study was that San Francisco should establish consumption-based emission reduction targets to accompany the existing sector-based emission-reduction targets for 2030 and 2050.

A CBEI measures emissions that occur throughout the supply chain. It includes goods, such as materials, consumer goods, and food as well as services, including healthcare, education, and entertainment (Figure 7). The methodology then ascribes the final emissions demand to consumers, defined as households and government in San Francisco. A CBEI differs from a sector-based inventory because it includes emissions generated outside city borders to produce goods and services for consumption by residents. Thus, a CBEI provides insights about where local consumption gives rise to emissions outside a city, leading to additional opportunities for reducing emissions and avoiding inequities associated with outsourcing high-emissions activities to other communities, locally, regionally, and internationally.

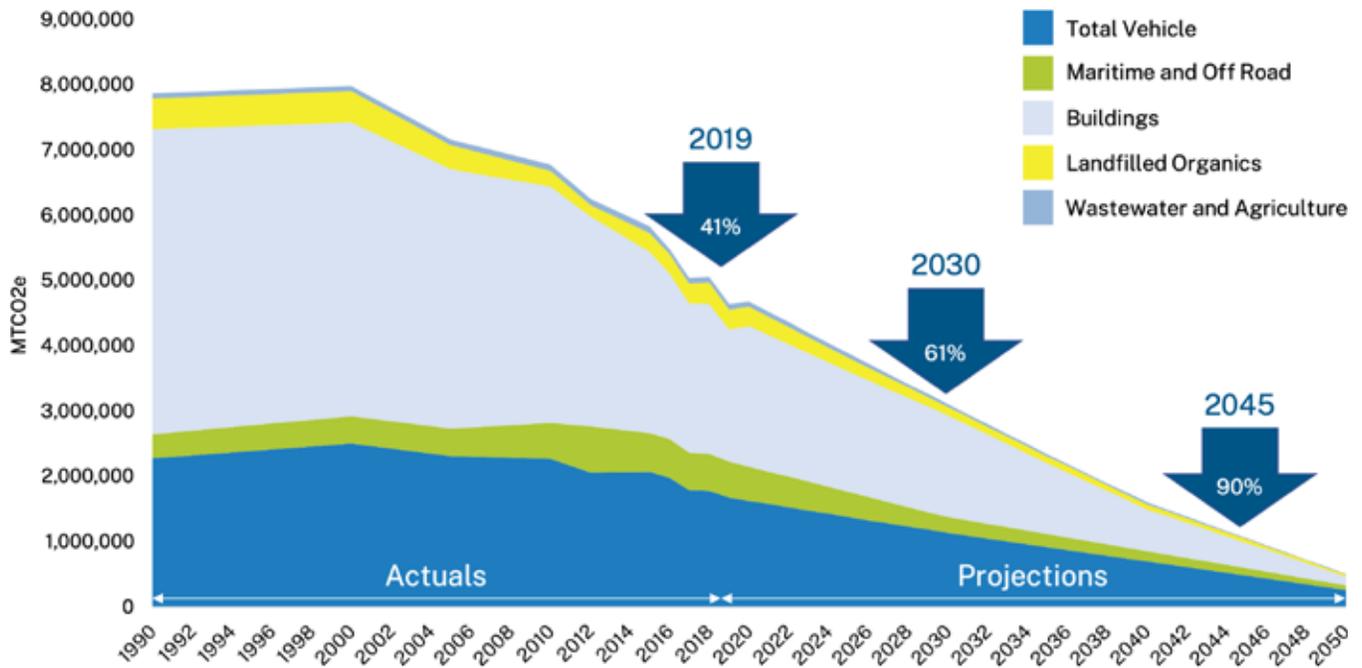


FIGURE 6: SECTOR-BASED GHG PROJECTIONS

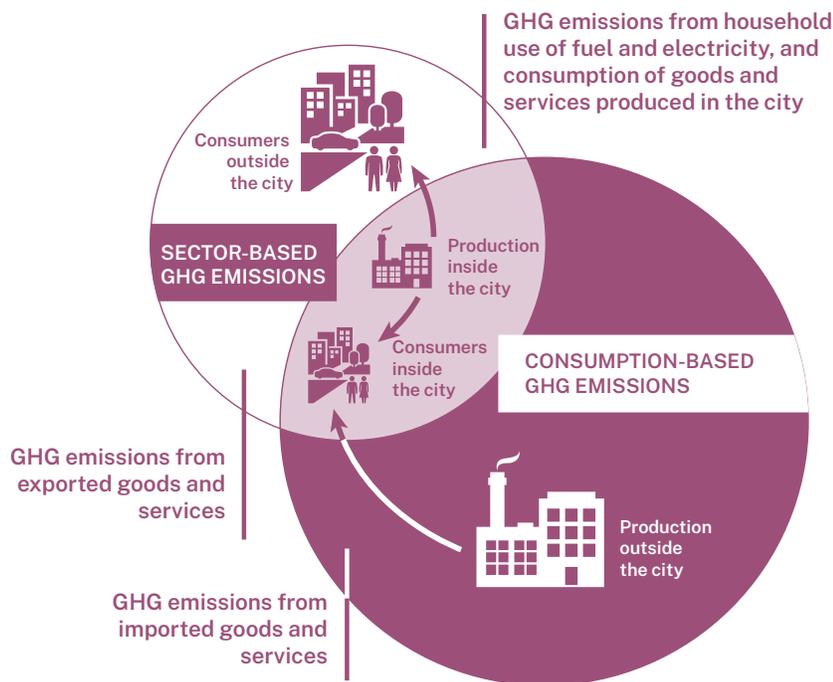


FIGURE 7: THE RELATIONSHIP BETWEEN SECTOR-BASED AND CONSUMPTION-BASED GHG INVENTORIES

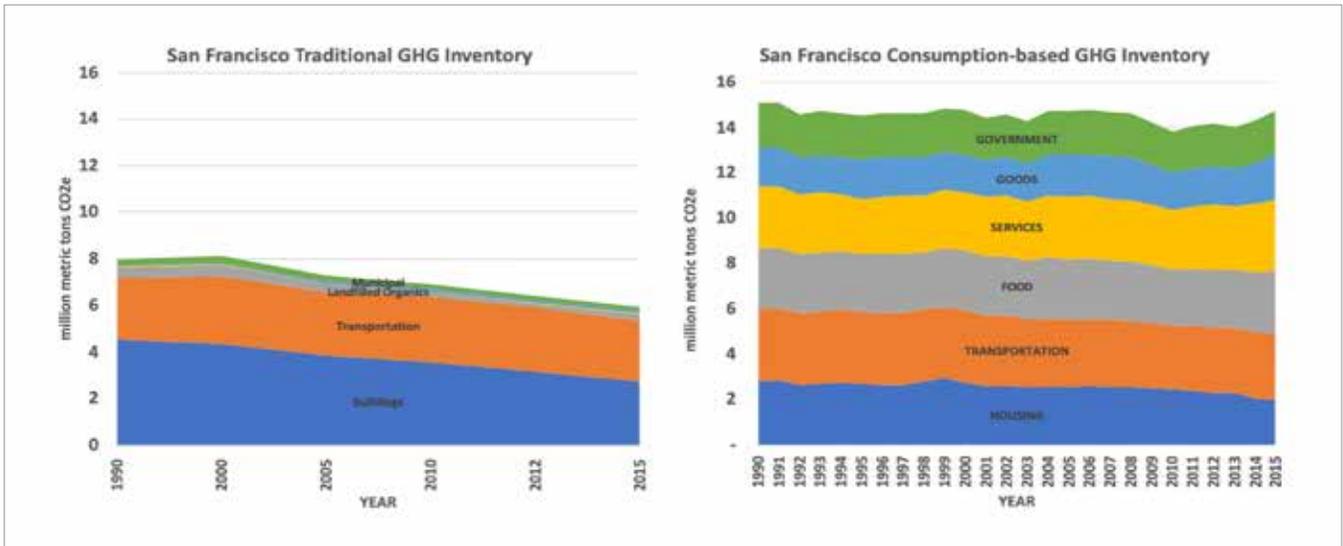


FIGURE 8: SAN FRANCISCO'S SECTOR-BASED AND CONSUMPTION-BASED GHG INVENTORY, 1990-2015

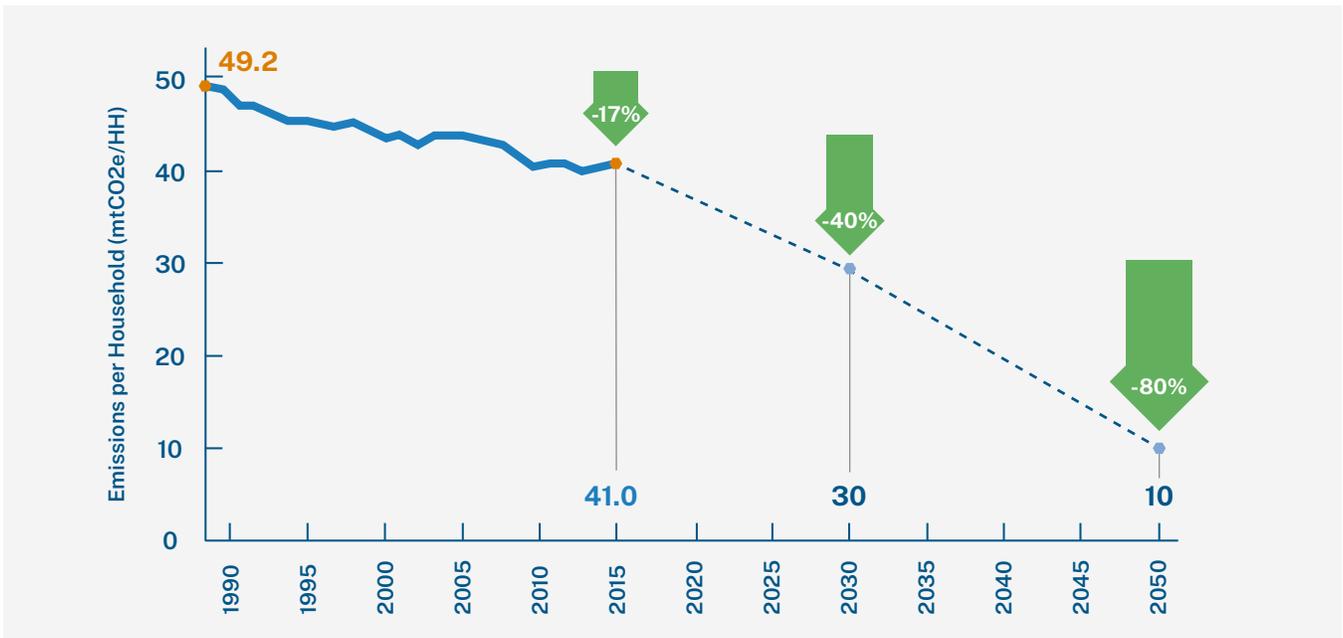


FIGURE 9: HISTORICAL (1990-2015) AND PROJECTED 2030 AND 2050 CONSUMPTION-BASED EMISSION REDUCTION TARGETS

According to the CBEI, San Francisco emitted 14.72 mtCO₂e, which is 2.5 times higher than the 5.93 million metric tons in the sector-based emissions inventory (Figure 8). Total city-wide Consumption-Based Emissions (CBEs) decreased 2% between 1990 and 2015 even as the city's population increased.

Between 1990 and 2015 CBEs were reduced 17%, from 49.2 to 41.0 mtCO₂e as measured on a per household basis (Figure 9). Policy-based CBE targets for San Francisco that align with SB 32 and recommendations from the CoolClimate Network suggest reducing emissions 40% below 1990 levels by 2030 and 80% below 1990 levels by 2050. These targets were adopted in by San Francisco in the updated version of Chapter 9 of the Environment Code. With aggressive state and local action between 2015 and 2030, San Francisco can reduce CBEs from 41 to 30 mtCO₂e per household, an ambitious yet appropriate goal.

EMISSIONS TARGETS AND CLIMATE GOALS

City staff, with community input, developed goals to reduce San Francisco’s emissions to achieve its sector-based and consumption-based targets (Table 5). Goals (Table 6) are consistent with international protocols from science-based targets, statewide reductions required under SB 32, and regional and global emissions goals.

TABLE 5: 2021 CLIMATE ACTION TARGETS

SECTOR-BASED EMISSION REDUCTION TARGETS	CONSUMPTION-BASED EMISSION REDUCTION TARGETS
By 2030, reduce emissions by at least 61% compared to 1990 levels	By 2030, reduce consumption-based emissions to less than 30 mtCO ₂ e per household, equivalent to a 40% reduction compared to 1990 levels
By 2040, achieve net-zero emissions by reducing emissions at least 90% compared to 1990 levels and sequester any residual emissions through nature-based solutions	By 2050, reduce consumption-based emissions to less than 10 mtCO ₂ e per household, equivalent to an 80% reduction compared to 1990 levels

TABLE 6: 2021 CLIMATE ACTION GOALS

ENERGY	By 2025, supplying 100% renewable electricity, and by 2040, supplying 100% renewable energy (no more fossil fuels).
BUILDINGS	By 2021, requiring zero onsite fossil fuel emissions from all new buildings, and by 2035, requiring zero onsite fossil fuel emissions from all large existing commercial buildings.
TRANSPORTATION	By 2030, an increase in low-carbon trips to at least 80% of all trips measured and an increase in the level of electrification of vehicles to at least 25% of all private vehicles registered, and by 2040, an increase in the level of electrification of vehicles to 100% of all private vehicles registered.
HOUSING	Building at least 5,000 new housing units per year with maximum affordability, including not less than 30% affordable units, and with an emphasis on retaining and rehabilitating existing housing.
ZERO WASTE	By 2030, a reduction in the generation of solid waste of at least 15% below 2015 levels and a reduction in the amount of solid waste disposed of by incineration or deposited in landfill of at least 50% below 2015 levels.
ROOTS	Sequestering carbon through ecosystem restoration, including increased urban tree canopy, green infrastructure, and compost application.

SECTION 4:

PLANNING FOR PEOPLE



Photo Credit: ShawnClover, Flickr

In addition to reducing emissions to zero over the next 20 years, the CAP strives to ensure all San Franciscans have the skills, knowledge, and resources to meet interconnected challenges that lie ahead, including climate change. To do so, the proposed strategies leverage community strengths, advance racial and social equity, and provide critical benefits to the entire community.

City climate action embodies the popular motto to “think globally but act locally.” By identifying and implementing policies, programs, and projects that will lead to meaningful reduction in emissions, San Francisco can help lead the international fight against climate change and pave the way for other jurisdictions to act on climate.

At the same time, reducing emissions offers a unique opportunity to advance other key City priorities: protecting public health; strengthening resilience to natural and industrial hazards and shocks; creating a more fair and inclusive economy; and importantly, directly addressing racial inequities and the marginalization of whole groups of people. Climate action is a vehicle to catalyze positive, transformative change across society that will protect all San Franciscans and support their ability to thrive.



Earth Day Volunteers 2012

CENTERING RACIAL EQUITY

The rapidly unfolding climate emergency requires that strategies go beyond reducing emissions and include actions that advance racial and social equity. Black, Indigenous, and People of Color (BIPOC) and low-income residents are among the least responsible for causing climate change, yet the most vulnerable to its harms, including heat stress, flooding in low-lying neighborhoods, and housing and food insecurity. When data is analyzed by race, the results of discriminatory policies are evident across every social indicator, including unemployment, health, household income, education, housing, displacement, criminal justice, and police violence.¹² Climate change will only exacerbate these disparities, so strategies to reduce emissions must be intentionally designed for equity to mitigate and reverse these outcomes.

Concurrent to the CAP update, San Francisco is also developing an [Environmental Justice Framework](#) as part of its update to the General Plan. The Environmental Justice Communities Map (Figure 9) will be used as a primary tool for tracking progress on CAP equity goals.

Interventions to reduce disparities and advance equity vary in scope. They can take the form of targeted benefits, specialized programs and policies, or they may take on fundamental drivers of inequity. Equity can be advanced by ensuring inclusive access to benefits, for example by providing subsidies for green technologies such as solar panels, electric vehicles or energy-efficiency upgrades to those who cannot afford them. In this example, strategies deliver benefits to populations who may lack access to them while also promoting new technologies. Strategies can also address the root causes of the inequity. For example, expanding affordable housing options by building new housing stock and eliminating discrimination in home loan applications can help people with lower incomes reduce emissions associated with commuting and less energy efficient older housing.

The commitment to a CAP grounded in equity and justice requires that policymakers go beyond examining how the benefits of green technology can become available to those who cannot afford them. Instead, policymakers should also examine root causes; for example, why some people cannot afford green technologies in the first place, and how to address these underlying causes, such as disparities in income and wealth accumulation.

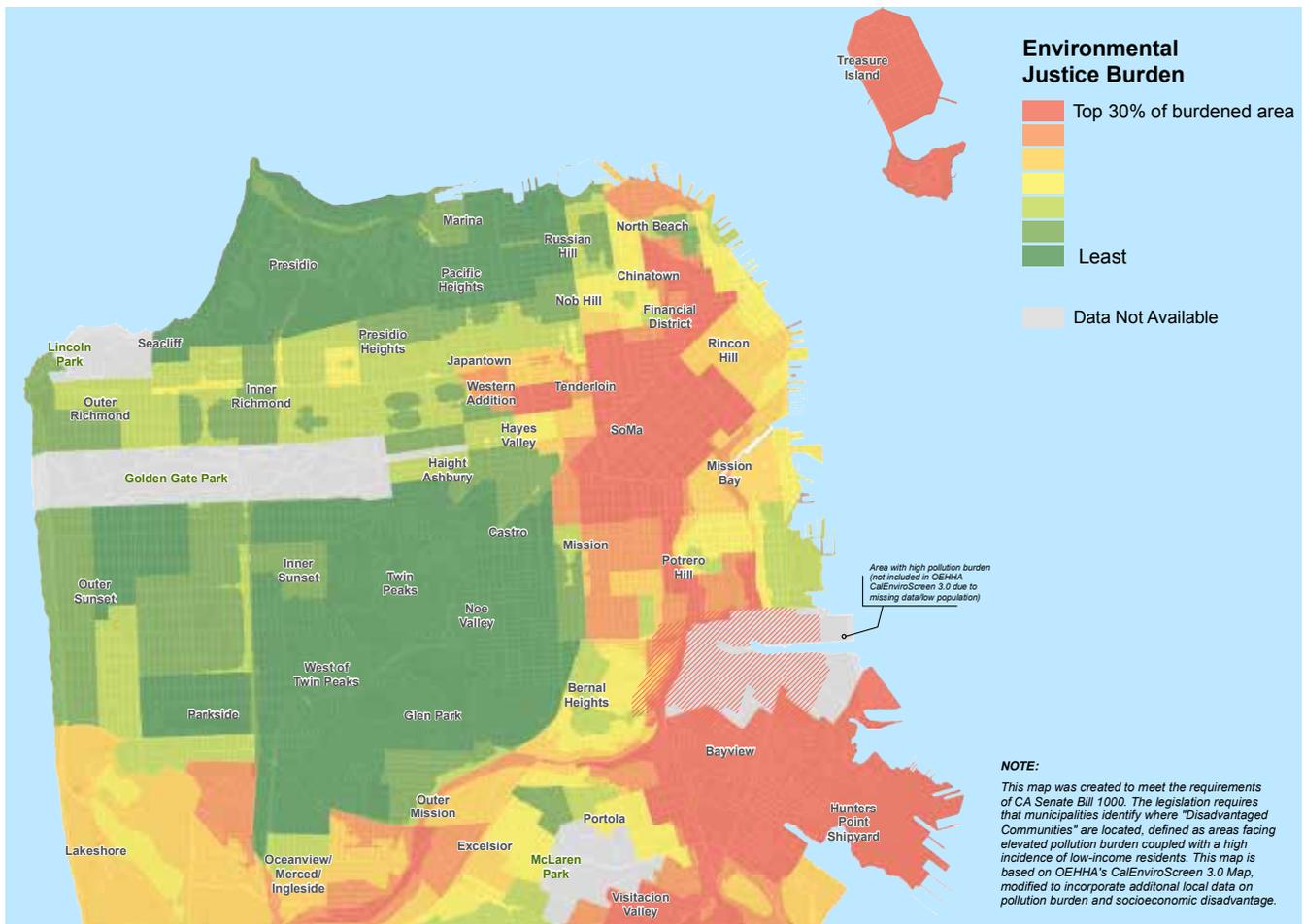


FIGURE 10: DRAFT ENVIRONMENTAL JUSTICE COMMUNITIES MAP¹³

CLIMATE ACTION PLAN “LENSES”

San Francisco views climate action through four complementary focus areas, or “lenses”, which have identified critical issues and shaped proposed strategies for future implementation. These considerations must be advanced to the extent possible to maximize benefits for the entire community, and with a special eye toward reducing burdens on marginalized communities.

Lens 1: Racial and Social Equity

Disparities by race and ethnicity in San Francisco and the Bay Area include median earnings (Figure 11), displacement (Figure 12) and home ownership and rent burden (described in **Section 5: Housing**).

Displacement, gentrification, and deep cultural losses have affected some of San Francisco’s most iconic neighborhoods, even as the city has experienced one of the longest periods of economic growth in its history. Poverty and racial and ethnic inequality have been identified as two foundational issues contributing to the disparities in San Francisco’s public health outcomes.¹⁴ The stark inequality must be vigorously addressed. Climate solutions that fail to address racial inequity are less likely to be successful while those that advance multiple goals and provide sustainable solutions for many years. To advance equitable climate action, a Racial and Social Equity Assessment Tool (R-SEAT, **Appendix D**) was created to assess CAP strategies for their potential to address fundamental drivers of inequity. The R-SEAT leads with race because

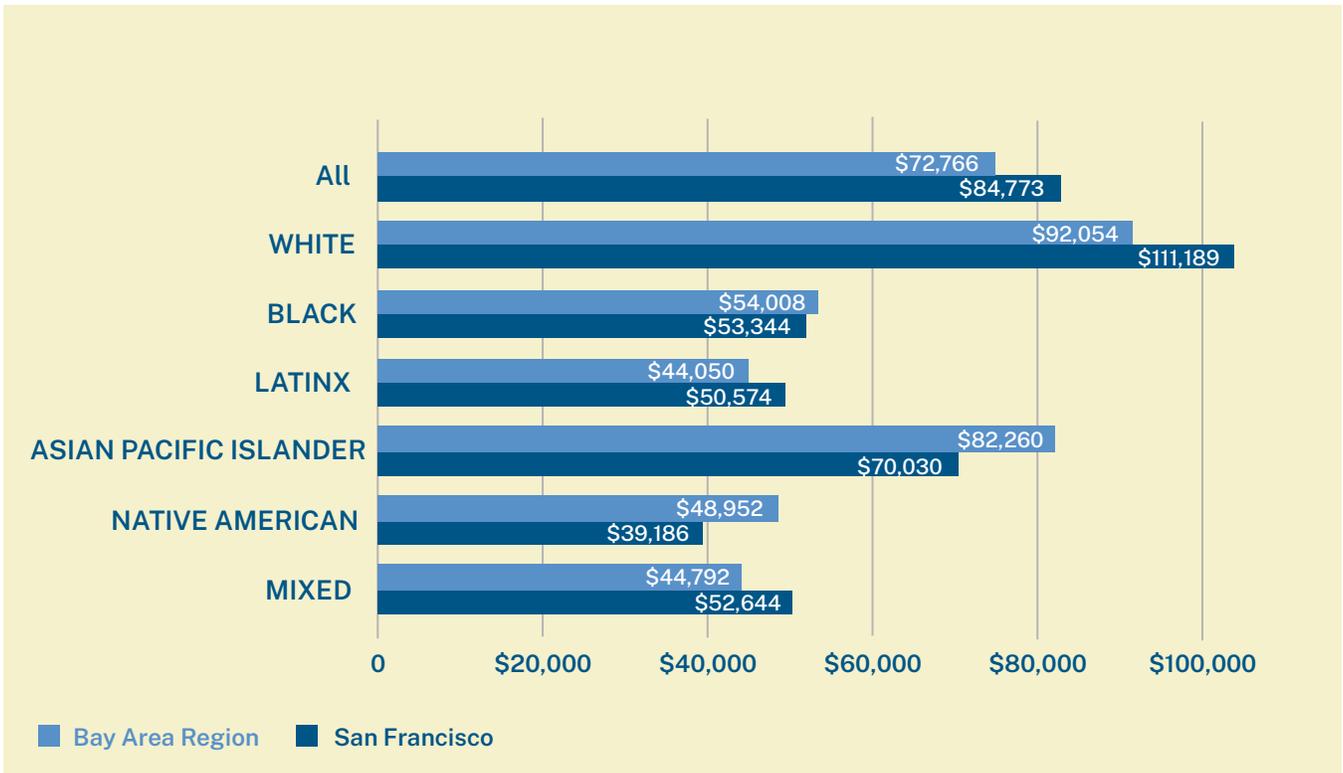


FIGURE 11: MEDIAN EARNINGS BY RACE AND ETHNICITY, 2019¹⁵

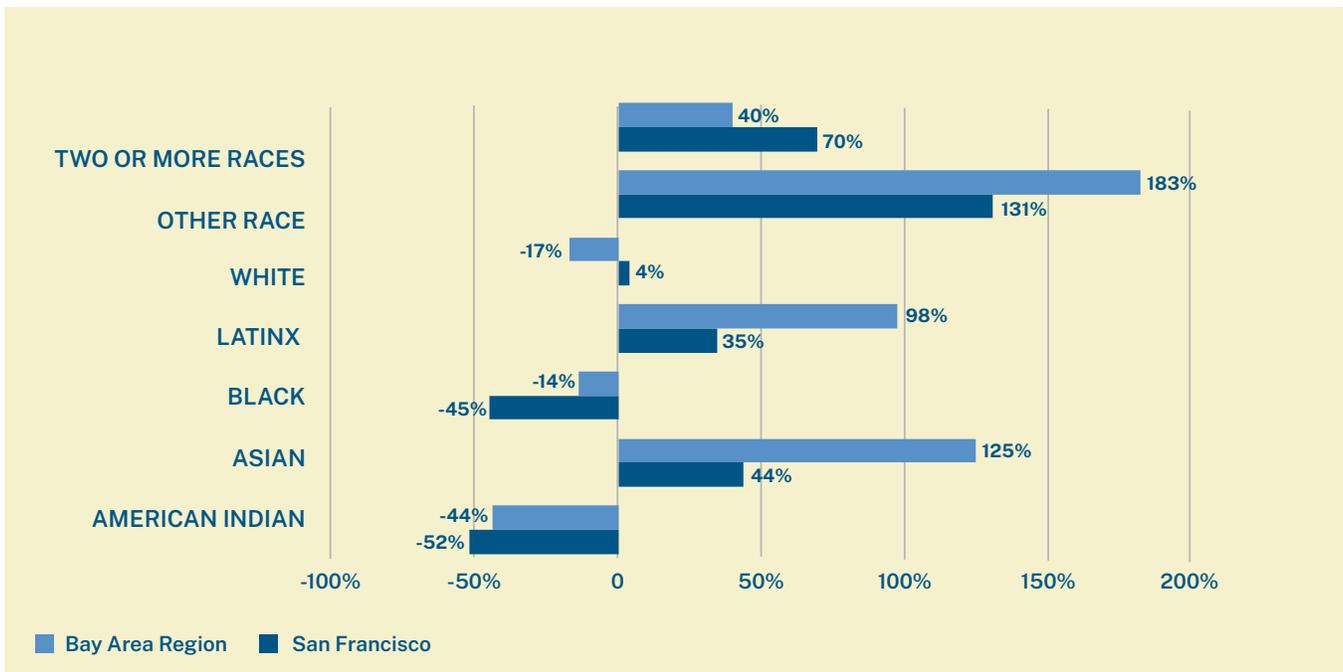


FIGURE 12: PERCENT CHANGE IN POPULATION BY RACE AND ETHNICITY, 1990 TO 2018¹⁶



racial discrimination intersects with other forms of marginalization. An intersectional approach accounts for how social categorizations such as race, class, gender, and sexual orientation create compounding discrimination or disadvantage.

Lens 2: Economic Recovery and Just Transition

Through ambition and effort, San Francisco has demonstrated it can significantly reduce emissions while having a prosperous local economy. However, many residents and families have not benefited from the city's prosperity. There is a real possibility that whole communities could be left behind and penalized in the shift to decarbonization, unless policies are advanced to protect against that harm. A new imperative — referred to as a just transition — is integral to achieving local, national, and international climate goals. A just transition calls for a strategic, people-focused approach to phasing out polluting industries while creating employment pathways for workers in those industries, plus a new generation of workers, to transition to quality jobs that support economic and climate justice.

COVID-19 impacted many people and communities financially, but those most at risk were predominantly people of color and individuals with lower incomes: the communities that will also be harmed most by climate change. Economic recovery driven by climate action must provide opportunities to eliminate racial disparities and economic inequality.

For this CAP, and the policy initiatives that feed into it,

the City engaged labor leaders, frontline communities, environmental justice advocates, and other key stakeholders to ensure strategies support all workers, including those in fossil-fuel based industries that must decarbonize. Launching the CAP while recovering from COVID-19's economic disruptions provides opportunities to help impacted community members find meaningful work while building on community strengths and advancing common goals, including improving public health.

Lens 3: Protecting Public Health

Climate change is one of the greatest public health threats of the 21st century. Both its causes — primarily burning fossil fuels and destroying tropical forests — and its effects have acute consequences for health. Climate-related events such as extreme temperatures, severe storms, and wildfires directly harm people and exacerbate pre-existing challenges such as poverty, food and housing insecurity, and displacement.

While everyone's health may be harmed by climate change, adverse health outcomes are not evenly distributed. Social Determinants of Health are defined as upstream conditions such as social and institutional inequities, as well as disparities in living conditions that impact people's health, including disease, injury, and mortality.

Social determinants are significant drivers of climate-related health inequities. Like other social determinants of health, climate change creates poor health outcomes, increased health care costs and disproportionately

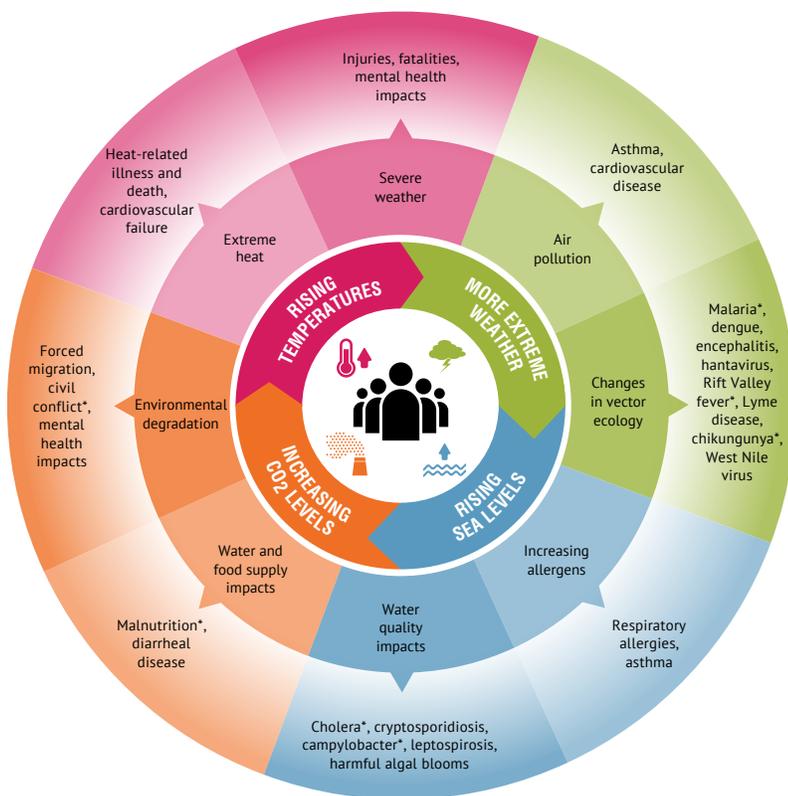


FIGURE 13: INTERCONNECTEDNESS OF CLIMATE CHANGE AND HEALTH

harms vulnerable populations such as seniors, children, people with disabilities, and people with pre-existing medical conditions. Research has concluded that the impacts from a changing climate are inextricably linked to poorer health.

Climate change impacts may be intensified by external factors such as location, proximity to infrastructure, and housing quality. For example, communities in flood plains and low-lying areas are more vulnerable to flooding from extreme storms, and families that live in homes without air conditioning or insulation are more vulnerable to extreme temperatures. Physiological characteristics may also make a person more vulnerable to climate stressors: those with pre-existing health conditions, such as asthma, are more vulnerable to dirty air from wildfire smoke; older adults are more vulnerable to extreme heat; and populations that rely on electronic medical equipment are more vulnerable to power shut-off's required for wildfire mitigation.

Climate change threatens human health in many ways, such as increases in rates of cardiovascular and

respiratory diseases; increases in water and foodborne illnesses; greater incidence of vector-borne diseases such as West Nile Virus; preventable injuries due to extreme weather events; increases in incidence of heat-related illnesses such as heat stroke, heat exhaustion, or even death. These stressors can also lead to impaired mental health. Figure 13 displays the most salient health impacts caused by climate change.

Addressing climate change can protect people's health. For example, walking and biking reduces traffic congestion and improves physical health, greenspaces and urban trees sequester emissions and improve air quality and mental health, and eliminating fossil fuels in buildings protects against chronic health conditions such as asthma.

Lens 4: Resilience

San Francisco has a long-standing relationship with natural disasters and hazards, coping with multiple risks since the Great Earthquake of 1906. Planning to mitigate future earthquake risks has been underway



FIGURE 14: CLIMATE ADAPTATION AND MITIGATION CREATE RESILIENCE

for decades. More recently, the City and region have started to face specific climate change impacts such as extreme heat and poor air quality caused by wildfires. These hazards, as well as other threats such as coastal flooding and drought, are projected to increase in severity and frequency as emissions continue to build up in the atmosphere. Because of the overlap between climate resiliency and other preparedness efforts, such as pandemic and earthquake preparedness, fire safety, and other endeavors, the City can take a multi-hazard approach to addressing community resilience (Figure 14).

The [Hazards and Climate Resilience Plan \(HCR\)](#) developed by City agencies and adopted by the San Francisco Board of Supervisors in 2020, identifies hazards and their associated vulnerabilities and consequences and presents strategies to reduce risks and adapt to unavoidable climate impacts. This approved plan is required for San Francisco to receive federal pre-and post-disaster hazard mitigation funding. The HCR also meets State adaptation planning requirements and will be linked to the Safety and

Resilience Element in San Francisco’s General Plan.

As San Francisco contributes to ambitious efforts to keep global temperatures below 1.5°C, it must also prepare for unavoidable climate impacts and other hazards that will hit home. All CAP strategies and actions were assessed for their potential to increase resilience. Two specific impact areas were assessed:

- Community adaptation and resilience — the information and services available to prepare for, respond to, and recover from a hazard event
- Physical environment resilience — the changes to buildings and infrastructure, including nature-based infrastructure, which reduce risks from hazards and pollution.

The strategies and actions detailed later in this plan are meant to not only support mitigation, but also adaptation and resilience. The ability to anticipate, prepare for, and respond to hazards of all types will improve climate resilience and help San Francisco communities better cope with impacts.



SECTION 5:

SOLUTIONS: A PATH FORWARD

ENERGY SUPPLY

BUILDING OPERATIONS

TRANSPORTATION AND LAND USE

HOUSING

RESPONSIBLE PRODUCTION AND CONSUMPTION

HEALTHY ECOSYSTEMS





Energy Supply

To become a zero emissions city, San Francisco must use only 100% renewable electricity for all energy needs and strategically phase out fossil fuels in all sectors.

Over the past two decades, San Francisco has made significant progress in reducing emissions in its electricity supply. It must continue this trend to not only support building and transportation decarbonization efforts, but to ensure all San Franciscans have access to reliable and affordable clean energy.

SECTOR GOALS:

100% renewable electricity by 2025

100% renewable energy (no fossil fuels) by 2040

CONTEXT

Eliminating fossil fuels as a source of power generation is key to achieving the City's emission reduction goals, and San Francisco has made great progress in this area. As shown in Figure 15, in 2019, 83% of electricity supplied to San Franciscans came from greenhouse gas-free resources, with 69% from renewable sources that include wind, solar, and existing large hydropower.¹⁷ Moving forward, San Francisco is well on its way to achieving 100% renewable electricity by 2025.¹⁸

Efforts to eliminate emissions from other key sectors such as Building Operations and Transportation & Land Use rely heavily on replacing dirty, fossil-fuel based energy sources such as natural gas, gasoline, and diesel with a plentiful and affordable stream of renewable electricity. The demand for electricity will increase as transportation electrification and building decarbonization efforts grow, and as the local population increases.

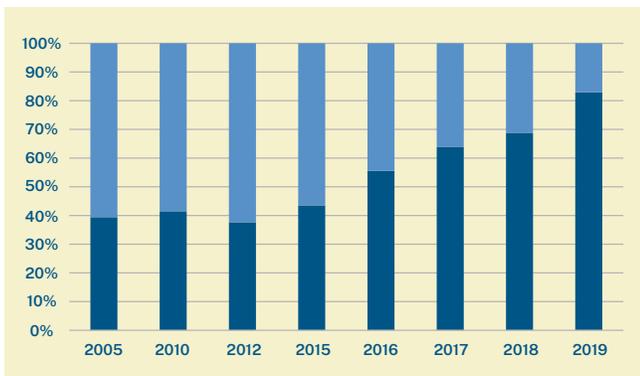
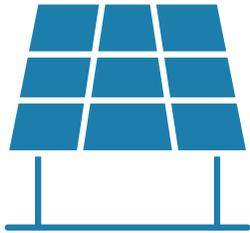


FIGURE 15: PERCENTAGE OF SAN FRANCISCO'S ELECTRICITY SUPPLIED BY RENEWABLE OR EMISSIONS-FREE SOURCES¹⁹

Accomplishments



Constructed

3

new solar installations
on city property.

Announced major milestone of providing

100%

renewable energy to all CleanPowerSF
customers by 2025.



Completed our first
solar plus battery storage
project in Diamond Heights.

Committed to **468 MW** of new and solar projects in California,
enough to power over

430,000

San Francisco homes.

“Sourcing cleaner electricity is one of the most powerful local tools we have to combat the climate crisis. Through our Hetch Hetchy Power and CleanPowerSF programs, we’re now serving more than 70% of the electricity consumed in San Francisco with energy that is clean, affordable, and reliable.”

–Barbara Hale,
Assistant General Manager, Power Enterprise,
San Francisco Public Utilities Commission

Clean Electricity and San Francisco’s Utility Landscape

The San Francisco Public Utilities Commission (SFPUC) provides more than 70% of the electricity consumed in San Francisco through two programs: Hetch Hetchy Power and CleanPowerSF. Hetch Hetchy Power is San Francisco’s publicly owned utility that has been generating hydroelectric power for more than a century. It energizes municipal services such as Muni, public schools, and the San Francisco International Airport, and an increasing number of residents and

businesses, including numerous affordable housing developments as well as tenants of Salesforce Transit Center. Launched in 2016, CleanPowerSF is the City’s Community Choice Aggregation (CCA)²⁰ program serving more than 380,000 customer accounts in San Francisco, providing renewable energy to residents and businesses at competitive rates.

As detailed in Figure 16, the remaining electricity customers are served by PG&E, an investor-owned utility, or Direct Access companies, independently contracted, for-profit energy service providers who work with large commercial and industrial customers.

Fully transitioning all San Franciscans to renewable electricity is challenging given this complex landscape. Hetch Hetchy Power already provides 100% renewable electricity, while CleanPowerSF will provide 100% renewable electricity to all its customers by 2025. However, PG&E and Direct Access providers are on track to meet the state’s goal of 100% renewable electricity by 2040. Accelerating this timeline will require customers to choose 100% renewable electricity programs offered by their utility or switch providers. San Francisco could also more expeditiously meet local clean energy goals by successfully acquiring PG&E grid assets located in the city.

Energy Supply

As climate change continues to impact San Francisco, it is critical that the electrical grid withstand the threats of extreme weather and continue to reliably provide power to City residents and businesses.

The SFPUC continues to ensure it can provide clean, safe, and affordable energy to its customers despite challenging external conditions through vegetation management, proactive maintenance, and safety and reliability checks. The SFPUC is also investing in local solar-plus-battery-storage projects and building out new, modern grid infrastructure.

In the past few years, the risk of wildfires has led PG&E to turn off power lines during high winds or dry conditions. Fortunately, San Francisco is less likely to suffer blackouts during these Public Safety Power Shutoff (PSPS) events due to the lower likelihood of wind-induced fire events within the city and its location on the transmission grid. However, San Francisco will continue to advocate for increased grid resiliency at the state level as appropriate.

Equity and Grid Decarbonization

As the city strives to create a zero-emission future and a more equitable society, all San Franciscans should be able to participate in the clean energy economy. Electric

rates must be affordable and based on cost-of-service, while clean energy must be available to all.

Low-income residents can currently qualify for bill assistance programs that can reduce their electric bills by up to 35%. Moreover, the SFPUC continues to design and develop programs to ensure low-income residents and marginalized communities can help drive the transition to clean energy. The GoSolarSF Program provides incentives to install rooftop solar in low-income communities, and the Disadvantaged Communities Green Tariff and Community Solar Green Tariff programs are being developed to increase the adoption and development of affordable renewable energy within Disadvantaged Communities, as defined by the state through CalEnviroScreen.²²

The City believes that access to information to make the best decisions about energy choices is key to advancing equity in the energy sector. To that end, the SFPUC creates culturally competent translations of program materials, and ensures that customers without access to the internet can receive program information by phone and through written materials.

Developing clean energy resources also presents an economic opportunity for San Franciscans. Building local distributed energy resources, such as solar and storage, can create jobs and increase capacity to meet growing electricity demand.

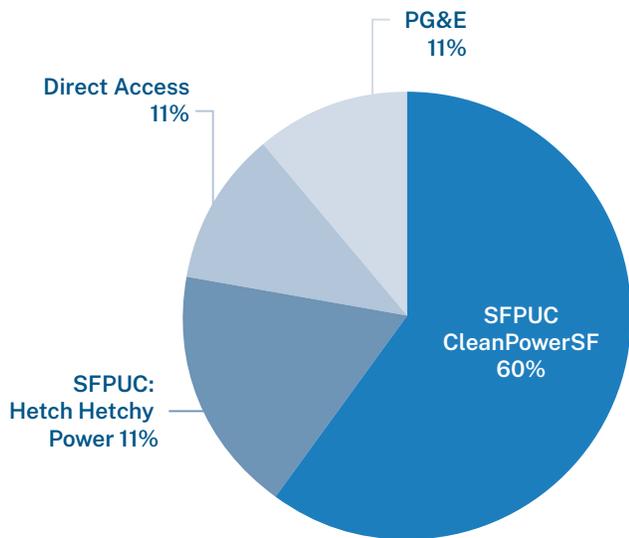


FIGURE 16: SAN FRANCISCO ELECTRICITY SUPPLY BY PROVIDER, 2020²¹

Eliminating Natural Gas Infrastructure

Retail natural gas costs are largely determined by fixed costs to build and maintain utility distribution infrastructure, particularly gas piping. Failing to manage costs for maintaining and upgrading existing gas piping while demand and sales decline from decarbonization would lead to rate increases that will disproportionately impact low-income customers. Building electrification accompanied by strategic decommissioning of gas infrastructure will directly eliminate emissions from gas usage and reduce methane leakage from the distribution network.²³ This planning effort will help shield low-income ratepayers from unfair cost burdens while also reducing risks from pressurized gas piping, such as poisonous methane leaks, explosions, and fires.

In 2020, the California Public Utilities Commission (CPUC) initiated a process to plan for the long-term disposition of gas utilities in California. San Francisco can support these efforts by engaging with businesses, residents, state regulators and PG&E, to develop a

local approach for decommissioning gas infrastructure informed by constraints and opportunities for workers, families, and neighborhoods to ensure equitable outcomes.

Strategies Overview

To eliminate GHG emissions in the energy sector, San Francisco must reach 100% renewable electricity and strategically phase out the use of fossil fuels, namely natural gas from buildings and gasoline and diesel from cars and trucks. The strategies listed below focus on an equitable transition to clean energy and require community input to ensure all San Franciscans have access to reliable and affordable clean energy.

Top Climate Solution:

Use 100% renewable electricity and phase-out all fossil fuels



Did you know?

Co-Benefits of Climate Action:²⁴ Installing solar PV and battery backup systems at critical facilities²⁵ can result in:

REDUCED EMERGENCY RESPONSE COSTS

\$6.2 M

Disaster services workers reduced by **37,000**, 2021–2050

HEALTH CARE SAVING

\$452, 000

Non-emergency injuries treated at shelters, over 7-day post disaster period

REDUCED UTILITY COSTS

\$43 M

Ongoing savings from on-site solar and battery backup, 2021–2050

All figures above in net present value



Did you know?

Job Potential of Climate Action:²⁶ Continuing to develop 2-3 solar projects annually on municipal buildings through 2050 can provide:

43,200 – 84,600 WORK HOURS

For local construction workers, not including ongoing maintenance and manufacturing

ES.1

STRATEGY

Supply 100% greenhouse gas-free electricity to residents and businesses.



WHAT WOULD SUCCESS LOOK LIKE?

100% of SF residents and businesses use affordable, renewable electricity by 2025



GHG REDUCTION POTENTIAL BY 2030

Less than 100,000 mtCO₂e



ESTIMATED COST BY 2030

\$\$\$\$\$: 500 million+



CLIMATE METRIC

% of renewable electricity used in SF



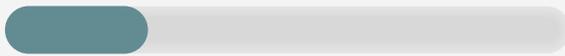
EQUITY METRIC

% eligible SFPUC customers on low-income rates

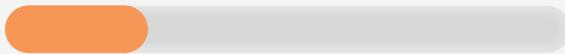
Supporting Actions

- ES.1-1 Provide 100% renewable electricity at affordable rates.
- ES.1-2 Promote early adoption of 100% renewable electricity products to all San Franciscans, with a preference for City programs.
- ES.1-3 Ensure 100% renewable electricity is the only option for San Francisco residents and businesses by 2025, by supporting state or local regulatory requirements and/or acquiring PG&E's grid assets serving San Francisco.
- ES.1-4 Continue to expand programs and rates that provide low-income customers with renewable electricity and ensure community and stakeholder engagement in program development and rate-setting.

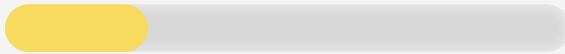
COMMUNITY BENEFITS



RACIAL AND SOCIAL EQUITY**



JUST TRANSITION



HEALTH



RESILIENCE

STRATEGY

Invest in local renewable energy and energy resilience projects.

ES.2



WHAT WOULD SUCCESS LOOK LIKE?

Local renewable electricity is developed where safe and affordable



GHG REDUCTION POTENTIAL BY 2030

Enabling/Accelerating (no direct reduction)



ESTIMATED COST BY 2030

\$\$\$: 10-100 million



CLIMATE METRIC

% of MW of local renewable energy (solar, storage, etc.) deployed



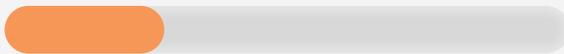
EQUITY METRIC

low-income customers enrolled in SFPUC customer programs

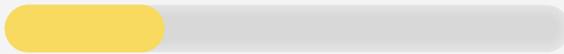
COMMUNITY BENEFITS



RACIAL AND SOCIAL EQUITY



JUST TRANSITION



HEALTH



RESILIENCE

Supporting Actions

- ES.2-1 Assist affordable housing developments with installing on-site solar and battery storage and meeting City energy efficiency and solar energy requirements.
- ES.2-2 Continue to develop onsite solar on City-owned buildings and reservoirs based on emerging opportunities and SFPUC feasibility analysis.
- ES.2-3 Explore developing grid-independent solar and storage at critical municipal facilities and other critical or vulnerable community sites.
- ES.2-4 Support the development of local renewable electricity production by scaling up programs such as net metering, community solar, feed-in tariffs, and battery storage.
- ES.2-5 Ensure SFPUC customer programs center equity in their design and metrics.
- ES.2-6 Continue to encourage private sector investment in local renewable energy solutions by engaging in public advocacy, educating consumers about their options (such as financing), and serving as a strategic partner.

ES.3

STRATEGY

Design and develop the reliable and flexible grid of the future.



WHAT WOULD SUCCESS LOOK LIKE?

100% of the growth in electricity demand is met with renewable electricity



GHG REDUCTION POTENTIAL BY 2030

Enabling/Accelerating (no direct reduction)



ESTIMATED COST BY 2030

\$\$\$\$\$: 500 million+



CLIMATE METRIC

% of growth in electricity demand met with renewable electricity



EQUITY METRIC

Electrical rates are affordable and reflect cost of service

COMMUNITY BENEFITS



RACIAL AND SOCIAL EQUITY**



JUST TRANSITION



HEALTH



RESILIENCE

Supporting Actions

- ES.3-1 Plan for the change in electricity demand and usage due to electrification of transportation and buildings through efforts such as the SFPUC's Integrated Resource Plans and ensure community engagement in these efforts.
- ES.3-2 By 2023, evaluate the rate and program options to facilitate an affordable transition to all-electric buildings.
- ES.3-3 Invest in distribution infrastructure (including acquisition of PG&E assets) and smart-grid technologies, such as advanced metering infrastructure, demand response, and distribution automation.



STRATEGY

Develop workforce capacity to deliver clean energy resources.

ES.4



WHAT WOULD SUCCESS LOOK LIKE?

Clean energy workforce reflects the diversity of our community



GHG REDUCTION POTENTIAL BY 2030

Enabling/Accelerating (no direct reduction)



ESTIMATED COST BY 2030

\$\$: 1-10 million



CLIMATE METRIC

N/A



EQUITY METRIC

% of CleanPowerSF products and services procured from women, minority, disabled veteran, or LGBT-owned businesses.

Supporting Actions

- ES.4-1 Continue to champion clean energy installers participating in City-funded incentive programs that engage in workforce development.
- ES.4-2 Utilize workforce development programs, such as Project Pull Internship and CityBuild, and education programs, such as Project Learning Grants and the Teacher Externship Program, to expose youth to clean energy related jobs and careers and diversify the workforce.
- ES.4-3 Include community benefits criteria for renewable energy and other contracts of \$5 million or more, giving preference to contracts that demonstrate a commitment to community benefits and environmental justice.
- ES.4-4 Engage in analysis to identify opportunities to meet diversity and workforce goals in the procurement of clean energy resources

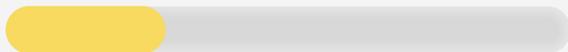
COMMUNITY BENEFITS



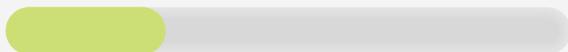
RACIAL AND SOCIAL EQUITY**



JUST TRANSITION



HEALTH



RESILIENCE

ES.5

STRATEGY

Plan for the equitable decommissioning of the city’s natural gas system.



WHAT WOULD SUCCESS LOOK LIKE?

Data collection, interagency collaboration, and community engagement informs an equitable plan and actionable steps.



GHG REDUCTION POTENTIAL BY 2030

Enabling/Accelerating (no direct reduction)



ESTIMATED COST BY 2030

\$\$: 1-10 million



CLIMATE METRIC

% of gas distribution piping located in neighborhoods with a plan for coordinated electrification.



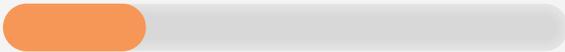
EQUITY METRIC

% community-endorsed plans in neighborhoods and business districts in communities with environmental justice burden as identified in [EJ Communities Map*](#)

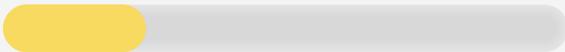
COMMUNITY BENEFITS



RACIAL AND SOCIAL EQUITY**



JUST TRANSITION



HEALTH



RESILIENCE

Supporting Actions

- ES.5-1 By 2023, assemble data to inform strategic and equitable planning for geographically focused electrification and gas decommissioning plans. Develop metrics to inform prioritization and implementation, including cost, equity, safety, climate and just transition.
- ES.5-2 By 2025, report annually on the status of gas decommissioning, including reduction of methane leakage in San Francisco attributable to decommissioning or removal of gas distribution, along with cost, equity, safety, and just transition.
- ES.5-3 By 2025, publish a Decarbonization Masterplan documenting the systematic approach to decommissioning natural gas distribution and transmission in San Francisco. Specify difficult-to-address loads/uses that are likely to remain “residual” in 2040. Provide neighborhood groups and business districts with interactive planning mechanisms to empower coordination of electrification, and to set localized goals and priorities.
- ES.5-4 By 2026, establish memorandum of understanding between the City, state regulators, and utilities stating mutual intent to de-commission natural gas transmission and distribution in San Francisco.
- ES.5-5 By 2030, transition the district system steam loop serving downtown and Civic Center to renewable energy.





Building Operations

Transitioning buildings from natural gas to clean electricity is critical to reach the City’s climate, health, and resiliency goals. Strategies must protect low-and-middle-income renters and owners, support affordable housing, ensure new jobs, and provide training for local workers.

In 2019, buildings were responsible for 41% of citywide emissions, evenly split between residential and commercial buildings. Of that total, the overwhelming majority (87%) was from natural gas burned to operate heating systems, boilers, water heaters, clothes dryers, and cooking appliances while 13% was from electricity. While emissions from buildings have successfully been cut in half since 1990 – thanks to aggressive energy efficiency investments, stringent green building codes, and a cleaner electricity supply – achieving net-zero emissions by 2040 will require a strategic shift from natural gas to 100% renewable electricity. Implementation mechanisms, such as legislation, incentives, training, and public education must be designed with ongoing and open engagement with all stakeholders, and focus on creating opportunities and protections for BIPOC, low-and-moderate income residents, and other marginalized populations, while prioritizing a just transition for all workers.

Accomplishments



Effective June 2021

San Francisco adopted an ordinance that bans natural gas in all new construction

San Francisco's 2020 SF Energy Fair attracted

450+ participants

and featured 27 exhibitors and 20 speakers



Home to 9 all-electric 100% affordable housing projects avoiding indoor and outdoor air pollution in hundreds of units.

San Francisco's energy benchmarking law motivates

3,114

large commercial and multifamily buildings to improve energy efficiency performance; reducing commercial energy use **10%** from **2013 to 2017**.

SECTOR GOALS:

Zero emissions new construction by 2021

All large commercial buildings are zero emissions by 2035

All buildings are zero emissions by 2040

CONTEXT

Past successes and business-as-usual approaches will not be sufficient for buildings to achieve full decarbonization by 2040. The energy, policy, and technology landscape for buildings in 2021 is very different from what it was in 1990, 2000, or even 2010. Meaningful partnerships between all building stakeholders will be needed to chart a path to the healthy, equitable, and prosperous future.

Harnessing the power of renewable electricity

Clean, reliable, and affordable electricity is the key to eliminating building emissions. Emissions from electricity supplied to San Francisco are declining and in the coming years will approach zero as all of the city's

electricity providers increase renewable electricity supply. As noted in section 5.1, Hetch Hetchy and CleanPowerSF supply more than 380,000 city residents and businesses with electricity and are on track to meet San Francisco's goal of supplying 100% renewable electricity citywide by 2025.

By contrast, emissions from fossil fuel used in buildings – primarily natural gas – are not declining and now account for almost 90% of building-sector emissions; this share will continue to grow over time as the electricity supply gets cleaner. At this time, options to provide gas from renewable sources are too limited to meet the task at hand, so achieving sector goals will require transitioning all buildings to renewable electricity.

Efficient and all-electric buildings

In 2020, San Francisco passed legislation requiring all new building construction to be efficient and all-electric, meaning highly energy efficient and no new natural gas for buildings. This policy, which went into effect in June 2021, will all but eliminate operational emissions from new buildings – nearly 10 years ahead of the City's commitment – and prevents natural gas emissions that otherwise could have been locked in for decades to come.

ZERO EMISSION BUILDINGS TASK FORCE

For the scale of change required to meet goals for buildings, all stakeholders will need to be involved in developing and implementing fair and effective solutions. SF Environment partnered with PODER and Emerald Cities to form the Anchor Partner Network (APN) which designed and delivered targeted engagement with a diverse set of community stakeholders to identify equity priorities and approaches for residential building decarbonization. Mayor London Breed convened the “Zero Emissions Buildings Task Force” which met between 2018 and 2020 and brought together building sector leaders, advocacy, non-profit, community, and financing partners to identify equitable and effective pathways for building decarbonization. The APN was complemented by the “Existing Commercial Buildings” working group which focused on the largest properties with the largest carbon footprints; an “Existing Municipal Buildings” working group which addressed project selection and capital planning in city-owned facilities; and a “New Construction” working group which informed the All-Electric New Construction Ordinance in Dec. 2020.

The transition for existing buildings will be much more challenging and will require inclusive engagement with a broad spectrum of stakeholders to co-create and deliver the necessary suite of policies, education, and funding support for an equitable transition. These solutions must consider the city’s diverse building stock, deferred maintenance, and substandard electrical connections, while also acknowledging that approximately two thirds of residents are renters who will need protections against rent increases, disruption, and displacement. Continuing to pursue and implement cost-effective energy efficiency is also crucial to realize important benefits while making electrification more affordable.

In retrofitting existing buildings, key barriers include the cost of new appliances, workforce readiness, and electrical panel upgrades and capacity. Yet, every existing building will experience advantageous moments for decarbonization over the coming years—and success will require foresight to act on opportunities as they arise. For instance, roughly 5%²⁷ of energy-using equipment is replaced each year as boilers, heaters and other equipment age. Key opportunities for upgrading to efficient and all-electric equipment include during renovation or seismic retrofit, when a property is sold, or replacing equipment at the end of its useful life. Decarbonizing at these moments will minimize costs and present natural inflection points for incentives and other policy interventions. These principles are at the center of Building Operations strategies and supporting actions, which as modeled, are projected to eliminate nearly all sector emissions by 2045 (Figure 17).

An equitable transition

An equitable transition to efficient and all-electric buildings will deliver important benefits to the whole community. Electrification reduces exposure to pollutants from burning natural gas, which contribute to respiratory illnesses, including asthma. Heat pumps can provide both heating and cooling, which can protect residents from extreme temperatures, which is especially important for older adults and populations with pre-existing health conditions.

Robust tenant protection policies and leasing strategies must be in place to prevent displacement for residents and businesses. Funding support and financial incentives must grow rapidly to fuel increased demand for retrofits. New education resources will be critical to inform owners and tenants about the many benefits of zero-emission buildings.

Building decarbonization can create well-paid jobs for installers trained to build and maintain efficient and all-electric buildings. Just Transition principles, which prioritize opportunities for those leaving carbon-intensive industries and for disadvantaged workers seeking employment in the low-carbon economy, must guide workforce policies, programs, and investments.

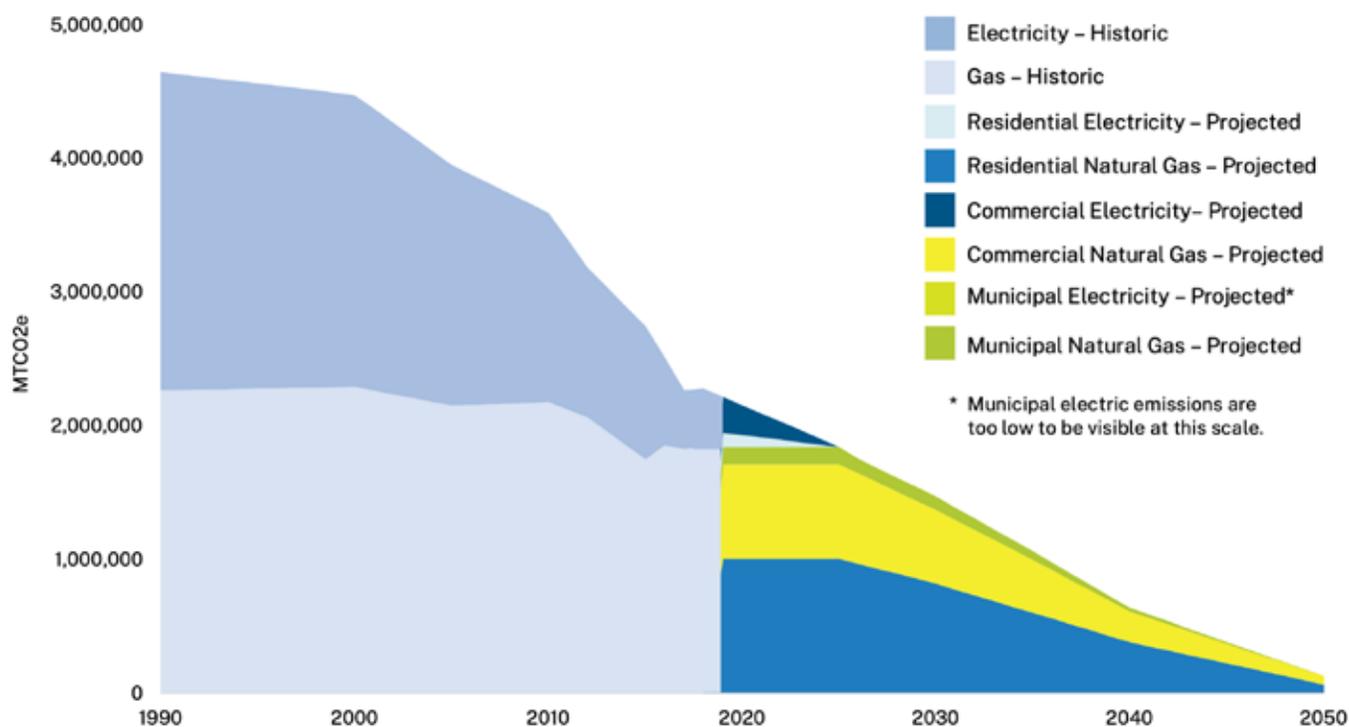


FIGURE 17: PROJECTED EMISSIONS FROM BUILDINGS

Other necessary actions include: advocacy for accessible interfaces on electric home appliances to ensure there are affordable options which can be used by someone who is blind or low-vision, maintaining affordable electricity rates that include low-income customer discounts, optimizing renewable electricity resources on the grid, and engaging with manufacturers to reduce costs and guarantee good performance.

Beyond operational emissions

Refrigerants

Air conditioners, refrigeration systems, and heat pumps all use chemicals called refrigerants to move heat and thus provide heating and cooling. Today's most common refrigerants are hydrofluorocarbons (HFCs), potent heat-trapping emissions that are many times more powerful than carbon dioxide produced when burning fossil fuels. These emission sources are not included in the standard sector-based inventory methodology, but are critical to address.

While heat pumps directly eliminate natural gas emissions, HFC leakage would reduce these gains. The California Air Resources Board's (CARB) regulations

require transitioning to new refrigerants that trap less heat; HFCs have been banned from large new refrigeration installations starting in 2022 and will begin requiring even lower-emissions alternatives by 2025. Local efforts will focus on ensuring building owners comply with CARB's regulations, supporting maintenance to reduce leakage, and advocating for stricter state and federal standards.

Embodied Emissions

Globally, buildings account for 39% of emissions. While 28% of all emissions come from operations, such as electricity use and heating and cooling, 11% come from materials and construction services, a category called "embodied emissions."²⁸ Globally, embodied carbon is responsible for 11% of annual emissions and 28% of total building sector emissions.

As operational emissions decline, embodied emissions will account for a larger share of total emissions. Strategies for reducing emissions from materials and construction activities are addressed in the Responsible Production & Consumption sector under RPC Strategy 1: "Achieve total carbon balance across the buildings and infrastructure sectors."

Strategies Overview

Today, nearly half (41%) of San Francisco’s emissions come from buildings. Fully transitioning buildings away from relying on natural gas to efficient technologies such as heat pumps that run on clean electricity will be critical to reaching the City’s climate goals. Strategies to get there will include protections for low-and-middle-income owners and renters, support for affordable housing developers, and ensure new job and training opportunities for local workers.

Top Climate Solution:
Electrify existing buildings



Did you know?

Co-Benefits of Climate Action:²⁹ Eliminating fossil fuel use in existing buildings can result in:

<p>REDUCED SOCIAL COSTS³⁰</p> <p>\$38 M</p> <p>From reduced outdoor air pollutant quantity from decarbonization of multi-family and office buildings, 2026 – 2050</p>	<p>REDUCED UTILITY COSTS</p> <p>\$232 M</p> <p>For multi-family and office buildings improving efficiency and fuel switching, accruing until and including 2050</p>	<p>JOB POTENTIAL³¹</p> <p>2,080 – 2,900 full time 30-yr careers</p> <p>Across a range of occupations, through 2050</p>
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All figures in net present value

STRATEGY

Eliminate fossil fuel use in new construction.



Building Operations

BO.1



WHAT WOULD SUCCESS LOOK LIKE?

All new buildings generate no emissions in their operation.



GHG REDUCTION POTENTIAL BY 2030

<100,000 mtCO₂e



ESTIMATED COST BY 2030

Cost neutral, potential savings



CLIMATE METRIC

TBD



EQUITY METRIC

new affordable housing developments which receive financial assistance for electrification

Supporting Actions

BO.1-1 By 2021, require newly constructed buildings to be efficient and all-electric with no on-site carbon emissions.



Casa Adelante (2060 Folsom): all-electric affordable housing with 127 affordable apartments, and 29 units for formerly homeless transitional-age youth. Developed by MEDA and Chinatown CDC. Photo credit: James E. Roberts-Obayashi Corp. (general contractor)

COMMUNITY BENEFITS



RACIAL AND SOCIAL EQUITY**



JUST TRANSITION



HEALTH



RESILIENCE



Building Operations

BO.2

STRATEGY

Eliminate fossil fuel use in existing buildings by tailoring solutions to different building ownership, systems, and use types.



WHAT WOULD SUCCESS LOOK LIKE?

New policies, financial incentives, and an expanded workforce align to make efficient, all-electric building upgrades the norm.



GHG REDUCTION POTENTIAL BY 2030

100,000 - 250,000 mtCO₂e



ESTIMATED COST BY 2030

\$\$\$\$\$: 500 million+



CLIMATE METRIC

Electrification rate (%/year of total)



EQUITY METRIC

% electrification projects in communities with environmental justice burden as identified in [EJ Communities Map](#)*

% financial assistance for electrification retrofits distributed in communities with environmental justice burden as identified in [EJ Communities Map](#)*

Supporting Actions

- BO.2-1 By 2023, develop a system to monitor the replacement rate of existing private sector natural gas-fueled equipment with all-electric. Annually report to BOS whether fossil-fuel using equipment is being switched at a rate sufficient to meet climate goals, including access to electrification by BIPOC and low-income communities.
- BO.2-2 By 2023, develop a time-of-replacement policy that phases in requirements that all newly installed residential and other small building equipment be efficient and all-electric. The policy should customize requirements for simple equipment replacements to full renovations.
- BO.2-3 By 2024, begin recording decarbonization status for each property at time of sale and permit review to ensure compliance with time of replacement policy.
- BO.2-4 By 2023, perform an inventory of natural gas-fueled equipment in municipal buildings.
- BO.2-5 By 2024, ensure the City's Capital Plan is updated to reflect the need to replace gas-fueled equipment, in alignment with the City's 2040 net-zero goal.
- BO.2-6 SFO will a) evaluate an efficient, all-electric Terminal Central Utility Plant that would reduce total direct (Scope 1) airport emissions by approximately 80% by 2030, and b) prioritize all-electric equipment replacements throughout campus buildings, including terminal and non-terminal spaces that are occupied by tenants and the Airport Commission.

COMMUNITY BENEFITS



RACIAL AND SOCIAL EQUITY**



JUST TRANSITION



HEALTH



RESILIENCE

BO.2-7 Adopt a building performance policy requiring large commercial buildings to:

- a) completely transition to efficient and all-electric equipment no later than 2035
- b) in 2025, begin regular disclosure of progress toward goal
- c) allow payment of annual fees in lieu of electrification, which must be invested into decarbonization of low-income and affordable housing.

BO.2-8 By 2023, develop and adopt tenant protection and anti-displacement policies for renters in buildings transitioning to efficient and all-electric systems.

BO.2-9 By 2023, begin offering targeted technical assistance for BIPOC and low-income owners and tenants including information about incentives, rebates, and public and private financing options.

BO.2-10 By 2024, pass a residential time-of-sale policy that requires an electrification plan, prioritizing water and space heating, indoor air quality, electric safety, how to access emergency response information, and recording of the presence or absence of gas service for each property.

BO.2-11 By 2024, develop and implement prescriptive criteria and permit & inspection processes for residential heat pump water heaters to be installed with a single integrated permit.

BO.2-12 Explore the creation of a revolving decarbonization fund by developing a virtual power plant (VPP) or other district scale solutions that monetizes the benefits derived from energy efficiency, demand response, and energy storage systems.





Building Operations

BO.3

STRATEGY

Expand the building decarbonization workforce, with targeted support for disadvantaged workers.



WHAT WOULD SUCCESS LOOK LIKE?

As demand for efficient and all-electric buildings increases, there is a racially diverse, well-trained and well-paid workforce to deliver building decarbonization services.



GHG REDUCTION POTENTIAL BY 2030

Enabling/Accelerating (no direct reduction)



ESTIMATED COST BY 2030

\$\$: 1-10 million



CLIMATE METRIC

N/A



EQUITY METRIC

TBD

Supporting Actions

- BO.3-1 Partner with workforce development entities, labor unions, and apprenticeship programs to align with and disseminate regional and statewide building electrification training, funding and project financing opportunities, prioritizing those transitioning from fossil-fuel dependent trades.
- BO.3-2 Partner with affordable housing providers, equipment vendors, subject matter experts, utilities and CleanPowerSF, CBO's and others to create a Climate Equity Hub to connect building owners and other customers with high-road service providers and installers, rebates and financing, and case studies.
- BO.3-3 By 2023, define goals and create policies for professional and workforce development building upon CityBuild Pro to ensure equitable access to building decarbonization jobs for BIPOC and low-income communities, from design to installation to business operations.
- BO.3-4 By 2025, create a Public-Private facilities managers and building operators roundtable to support peer-to-peer learning on fuel switching.

COMMUNITY BENEFITS



RACIAL AND SOCIAL EQUITY**



JUST TRANSITION



HEALTH



RESILIENCE

STRATEGY

Transition to low-global warming potential refrigerants.



Building Operations

BO.4



WHAT WOULD SUCCESS LOOK LIKE?

State and federal requirements significantly decrease GWP of refrigerants while equipment manufacturers offer more affordable low-GWP equipment options.



GHG REDUCTION POTENTIAL BY 2030

Enabling/Accelerating (no direct reduction)



ESTIMATED COST BY 2030

\$\$: 1-10 million



CLIMATE METRIC

of building owners who receive information and/or technical assistance to transition to low-GWP refrigerants.



EQUITY METRIC

% small businesses in communities with environmental justice burden as identified in [EJ Communities Map](#)* which receive information and technical support.

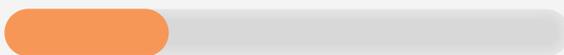
Supporting Actions

- BO.4-1 By 2023, publish guidelines for refrigerant management best practices for selection of lowest-GWP refrigerants in new and replacement equipment, and collection and recovery of refrigerants from existing equipment to enhance compliance with state regulations.
- BO.4-2 Support the adoption of more stringent state and federal regulations to reduce refrigerant GWP.
- BO.4-3 By 2023, support City departments' transition away from high-GWP refrigerants, by providing guidelines and specifications for future purchases of products containing refrigerants.

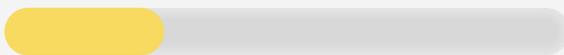
COMMUNITY BENEFITS



RACIAL AND SOCIAL EQUITY**



JUST TRANSITION



HEALTH



RESILIENCE



Transportation and Land Use

Addressing climate change means addressing San Francisco's transportation and land use issues head on. At nearly 50% of total city emissions, the transportation system must be transformed to reduce overall reliance on cars and equitably and efficiently connect people to where they want to go by transit, walking, and biking. All remaining vehicles must steadily transition to zero emissions.

SECTOR GOALS:

By 2030, 80% of trips taken by low-carbon modes such as walking, biking, transit, and shared EVs.

By 2030, increase vehicle electrification to at least 25% of all registered private vehicles, and to 100% of all vehicles by 2040.

CONTEXT

Transportation and land use policies are an essential part of San Francisco's plan to reach net-zero emissions by 2040. Getting the city on a path to a healthier, cleaner and more equitable future will require significant investments in reducing emissions from transportation. Climate action through transportation and land use means reversing the deliberate failures of past policies that heavily prioritized automobiles over modes that are safer, healthier, less carbon intensive, and more efficient. Ensuring that these low-carbon modes are less costly and more convenient to use than higher-carbon modes is key to achieving our climate goals and creating a socially equitable and environmentally sustainable future.

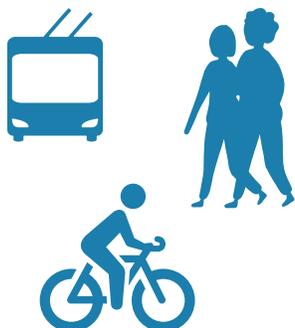
San Francisco has a goal that by 2030, 80% of trips are taken by low-carbon modes such as walking, biking, and transit.³² Strategies to help people make more trips without a car and reduce emissions include: improving transit service, expanding bicycle lanes and safe places for people to walk, increasing housing production density and development that puts people closer to destinations, and implementing pricing policies and parking management programs that better align with climate goals. While these investments will create many quality-of-life benefits for the city, they will not be enough to adequately cut emissions, so shifting remaining cars to electric vehicles that run on renewable electricity, will be necessary to meet the City's climate goals. San Francisco has set a goal that by 2030, vehicle electrification will increase to at least 25% of all registered private vehicles, and to 100% of all by 2040. Expanding access to affordable and convenient charging options will be primary way the City supports these goals.

Eliminating emissions from transportation will require a fundamental change in how people move around and how transportation and land use efforts are prioritized, funded, and implemented. Major adjustments will be required at all levels: citywide, neighborhood, and

Accomplishments

Market Street

significantly reduced traffic to enable safer use of low-carbon modes by banning private vehicles in 2019



Completed

42 total miles

of protected bike lanes in 2019, with 49 targeted by 2022

50%

low-carbon mode share goal reached, new target set for **80% by 2030**

Slow Streets

program dedicated more than

20 corridors

to active transportation, with four being made permanent so far

individual. Continuing down the same path of over-using single-occupancy private vehicles is the wrong direction, and will only exacerbate existing climate, health, equity, and transportation problems.

To meet San Francisco's climate action goals, policymakers and the public will need to evaluate significant trade-offs and then agree on and implement actions that go beyond the status quo. For example, acknowledging the total societal costs—on health, congestion, and climate—of planning cities around automobiles, and then taking strong action to prioritize people over cars. Such trade-offs may mean changing expectations about time devoted to commuting and running errands, adjusting subsidized parking and residential permits fees to create funding for new public spaces, more housing, and improved transit services.

Transportation Impacts

San Francisco faces many transportation challenges: safely and efficiently moving people around the city and region; serving the mobility needs of individuals with disabilities; managing, repairing, and expanding aging infrastructure; and responding to new mobility technologies and related regulatory issues. At the same time, people of color and low-income communities

have been underserved by existing transportation infrastructure, which has prioritized costly private cars over lower emissions alternatives such as public transit.

The transportation sector currently creates 47% of San Francisco's emissions. That share is rising due to meaningful advancements in the building and energy sectors and a comparative lack of progress in confronting automobile dependency and fossil fuels used for transport. As San Francisco prepares for rapid changes to reach net-zero emissions, it must ensure that costs and other burdens do not disproportionately fall on low-income people, people of color, and other populations that have faced a history of marginalization.

The transportation policies of the 1950s-1980s negatively impacted the wealth of BIPOC families and individuals and isolated entire communities from opportunity. Highway and transit investments scored better for federal funding when they removed "blight," defined as areas with more BIPOC communities. Policies of the time then began to promote automobile dependency and petroleum consumption, resulting in streets that made walking, biking, and taking transit more difficult. Even though these overtly racist policies have been rescinded, lower-income and BIPOC populations continue to face disproportionate harm.

Examples of these inequitable outcomes include:

- Lower income households have been forced into long commutes from auto-dependent places, greatly increasing time spent commuting.³³
- While Muni is the top carrier of low-income riders in the region and key to providing access to jobs and livelihoods for San Franciscans, bus speeds and reliability continue to be hindered by congestion from private vehicles.³⁴
- Residents living in proximity to freeways suffer disproportionately higher rates of cancer and respiratory diseases with larger racial and ethnic disparities.³⁵
- People of color are more likely to die of traffic-related crashes because streets in formerly redlined neighborhoods were built to accommodate faster car traffic, resulting in less safe conditions for non-motorists.

Past efforts to manage the City's limited street space and achieve better outcomes for travelers have led to stalemates, inaction, and the maintenance of the status-quo. Meanwhile, the costs of driving and car-dependence — including air pollution, traffic collisions, decreased mobility for low-income and communities of color, wasted time stuck in traffic — have gone unaddressed and in many instances have worsened. In most cases, these external costs are drastically underrepresented in the actual cost of owning a car, especially when compared to less harmful methods of transportation. For example, a monthly transit pass costs almost as much as what a residential parking permit costs for an entire year in San Francisco.

The City's efforts to decarbonize the transportation system must not repeat the mistakes of the past, but rather correct for past injustices and create a future that is safer, healthier, and more equitable. Transportation and land use investments that create the greatest benefits for historically marginalized people need to be prioritized, including:

- Reducing noise and air pollution in lower-income neighborhoods.
- Improving safety outcomes, especially for vulnerable populations, including travelers with disabilities.

- Expanding access to jobs, services, and education by increasing reliability of low-carbon transportation modes and reducing their financial and time cost.

The COVID-19 pandemic has exacerbated existing challenges with our transportation system and highlighted the major class and race divides in how we commute and work. It also forced agencies to quickly adapt. The City added new bike and pedestrian networks, modified transit service, added new transit-only lanes, and did more to meet the needs of essential workers and individuals who rely on transit. Many of these emergency efforts have been successful.

Even before the pandemic, San Francisco began to transform some of its streets. For instance, the downtown section of Market Street prohibits private vehicle use and speed limits were lowered in the Tenderloin to improve safety. Additionally, newly implemented transit-only lanes on Geary Boulevard, one of the busiest transit corridors in San Francisco, improved bus travel time with minimal traffic impacts to that corridor and surrounding streets.³⁶ As the City recovers from the pandemic, there is an opportunity to build on these successes to improve our non-driving travel options and enable transportation choices that address long-standing challenges, reduce emissions, and advance equity.

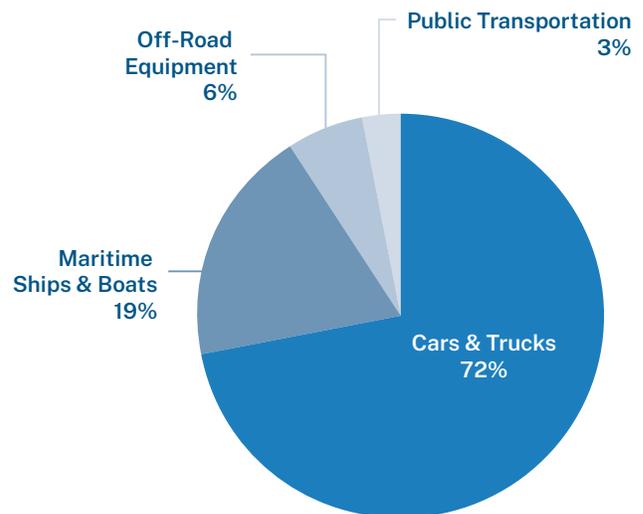


FIGURE 18: 2019 SAN FRANCISCO'S GHG INVENTORY - TRANSPORTATION SECTOR EMISSIONS³⁸

Increasing transit, biking, and walking

San Francisco has set a target of 80% of trips to, from, and within San Francisco to be made by low-carbon modes by 2030. In 2019, approximately 45% of all trips in, to and from San Francisco were made by driving.³⁷ Achieving San Francisco's climate goals for transportation will require a dramatic and sustained shift away from driving as the main travel choice. Of the 47% of total city emissions attributed to transportation in 2019, cars and trucks were responsible for the supermajority of emissions (72%), while local and regional public transportation contributed just 3% (Figure 18).

Often, people travel by car because it is their only practical option or is simply more predictable and time-efficient than the alternatives. Despite investments by the City, some transit routes can be slow and unreliable, and biking and walking are more dangerous on streets designed for motor vehicles. Successfully shifting trips to transit, walking, and biking means making these choices safe, convenient, reliable — and even fun. This can be done by redesigning streets to prioritize efficient movement of transit vehicles and reimagining streets as places for people of all ages and abilities. Examples of this include transit-only lanes, protected bikeways, HOV/carpool lanes, shared spaces, car-free roads in parks, and slow streets.

Integrating Transportation and Land Use

Land use refers to the location and intensity of “uses” such as housing, retail, open space, and commerce. Land use decisions directly affect people's travel choices, since how people get around depends on where and how far they need to go, and the effectiveness of available travel options. Cities like San Francisco that were originally built before the popularization of the automobile often have denser development patterns that are well suited to travel by foot or transit. As automobiles gained prominence, streets and buildings were increasingly redesigned to serve cars over pedestrians. In recent years, San Francisco has reversed that trend by removing parking requirements and revising density controls to enable the denser housing more reflective of older San Francisco construction. Still, much more can be done in San Francisco to further coordinate transportation and land use.

Through comprehensive area plans, improved street designs, and enhanced transit service, San Francisco is starting to shift back towards people-centered neighborhoods, with recent examples found in the Mission, Hayes Valley, and South of Market districts. There are many opportunities to create more of these amenity-filled areas and to enhance existing ones in a manner that benefits current residents and welcomes new neighbors. Neighborhoods that are further from the city core with less transit access end up experiencing higher driving rates; it is critical that new housing in the outer neighborhoods has access to additional transit service to support the use of non-driving modes.

Neighborhoods built with a mix of housing, services, and amenities close together, especially those with reduced or priced parking, encourage and allow people to walk, bike or use other zero-emissions means of travel for everyday needs. On the other hand, car-dependent neighborhoods take space from people and give it to roads and parking spaces. Suburban-style land use is hard to serve by transit, which leads to an increase in driving and climate pollution. Therefore, regional collaboration, creating new housing, and investing in regional transit continue to be major strategies for the CAP and Plan Bay Area 2050.

Housing, and where it is located, also plays a critical role in determining transit choices. As discussed in Section 5.4: Housing, substantially increasing housing near services, jobs, and other activities helps with shifting people's decisions to walk, bike, or take transit, rather than to drive.

While the San Francisco has made progress in developing more affordable housing, the production of new affordable units is not equitably distributed across neighborhoods. Affordable units tend to be concentrated in areas of the city with higher levels of environmental pollution and greater rates of poverty. Land use policies that encourage more transit use could include engaging with communities to strategically rezone high-opportunity areas to accommodate new multi-family housing, specifically in places that currently have strong economic, environmental, and educational outcomes including more parks, better air quality, and higher performing schools.^{39 40}

PURSuing SHARED GOALS

San Francisco's Transit First policy, which was added to the city charter in 1973, prioritizes land uses and street space for transit, walking, and explicitly discourages inefficient cars and parking. A vigorous, renewed commitment to implementing the Transit First policy directly supports climate action.

Vision Zero (adopted in 2014) commits resources to eliminate traffic fatalities, the vast majority of which occur due to interactions between large motorized vehicles and pedestrians and cyclists. Reducing car travel and car speeds will greatly reduce injuries and deaths on our roads.

Transit, walking and biking improve local air quality for everyone, especially people who suffer from respiratory illnesses like asthma. Similarly, low-carbon modes increase physical activity which can reduce the likelihood of health problems like diabetes and depression.

Car ownership, including loan payments, insurance, and fuel costs, creates significant financial burdens. Allowing people to meet their daily needs without having to own a personal vehicle lessens this financial burden and can give time back to families by shortening commute times and reducing car congestion.

Switching from Fossil Fuels to Renewable Electricity

Investing in transit system improvements and making land use changes will have long lead times before impacts are felt and measurable. Even with significant investments in transit and policies that encourage people to get out of their cars, reaching zero emissions by 2040 will also require an accelerated transition away from gasoline and diesel-fueled cars and trucks to zero-emission vehicles (ZEVs), primarily electric vehicles (EVs) that run on renewable electricity. By 2030, 25% of all registered private vehicles in San Francisco need to be zero emission, and by 2040, 100% of vehicles need to be zero emission.

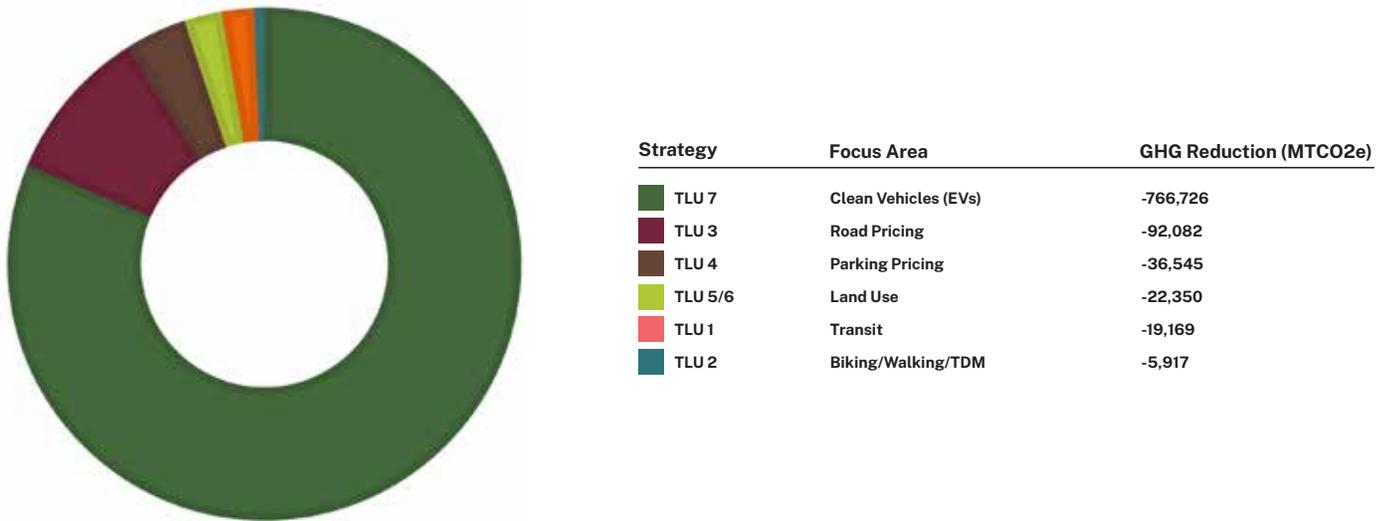
As is the case today, cars and trucks will still be needed in the future. With our current transportation infrastructure, private vehicles are often the best option for people with limited mobility such as youth or seniors, or people with disabilities. Support for transitioning to EVs should focus on these types of trips and drivers. As in any dense city, there are challenges to broad adoption of EVs in San Francisco. These include currently limited charging infrastructure, the unique challenges of multi-unit residential buildings such as limited parking, common garage meters, landlord-tenant "split incentives", as well as a general lack of off-street parking where charging is easier to install and access. These issues must be addressed for people to feel comfortable switching to EVs. San Francisco will continue to invest in expanding the network of public charging infrastructure, promote the adoption of zero emission vehicles, and make progress transitioning the City's non-revenue fleet to zero emission vehicles, among other policies.

While expanding vehicle electrification is essential to reducing emissions, there are uncertainties around the travel behavior associated with their use. For example, if EV adoption is led by those with higher incomes, it will worsen existing socio-economic disparities in the transportation sector. If not well managed and mitigated, these impacts could move San Francisco away from its long-range transportation and equity goals and result in increased congestion, unsafe roadways, and more inequity. Another specific challenge to address is that there are currently no wheelchair-accessible electric vans, which calls on San Francisco to develop solutions to this problem. Policies such as "Transit First" and principles such as "equitable access" in the "Electric Vehicle Roadmap for San Francisco" are aimed to safeguard against the potential unintended consequences of rapid electrification.

GHG Pathways for Emission Reductions and Co-Benefits

The pathways for projected emissions reductions from ground transportation are shown in Figure 19. Major changes to emissions result from actions affecting vehicle miles travel (VMT), and from the further adoption of EVs. See **Appendix C-3** for a technical

FIGURE 19: 2050 GHG REDUCTION POTENTIAL PATHWAYS (MTCO2E) BY FOCUS AREA FOR THE TRANSPORTATION AND LAND USE SECTOR⁴¹



overview. Figure 19 shows the projected emissions impact of each individual TLU strategy compared to the 2050 baseline scenario. When all strategies are implemented simultaneously, each strategy’s individual effectiveness is impacted by others, therefore the total reduction does not equal the exact sum of all strategies. Furthermore, the City will play a major role in integrating the shift to low-carbon modes with major transit improvements and land use strategies that can create significant regional emission reductions not included in the analysis.

With cars and trucks contributing such a large portion of sector emissions, electrifying private vehicles is projected to have a significant impact on emissions reductions. However, this focus does not reflect the full range of potential benefits that could come from transforming the transportation sector. To have a holistic approach to transportation policy, a co-benefit framework is critical to understand the synergies between current local impacts along with emissions reductions. This approach encourages decision making to account for multiple benefits and may assist with

funding efforts and garnering public support. Table 7 depicts six transportation co-benefits (emissions, congestion, equity, public health, safety, and economic vitality) and the alignment with each transportation action. This co-benefits framework acknowledges the multiple indirect climate change benefits that are clearly important as additional or primary motivations for adopting or implementing many of the transportation strategies and actions. It is essential to examine Figure 18 along with Table 7 to understand the total impact of each transportation action. For example, the actions in strategy TLU 2 that support walking, biking, and transportation demand management have lower emission reduction potential, but substantially align with important co-benefits and should still be considered an important climate mitigation strategy.

TABLE 7: CO-BENEFITS OF LOW CARBON TRANSPORTATION⁴²

CO-BENEFIT	EMISSIONS	CONGESTION	EQUITY**	PUBLIC HEALTH	SAFETY	ECONOMIC VITALITY
TLU 1: Build a fast and reliable transit system that will be everyone’s preferred way to get around.						
TLU 1.1	*	*	*	*	*	*
TLU 1.2	*	*	*	*	*	*
TLU 1.3	*	*	*	*	*	*
TLU 1.4			*	*	*	
TLU 1.5	*		*	*	*	*
TLU 1.6	*	*	*	*	*	*
TLU 1.7			*			
TLU 1.8	*	*	*	*	*	*

CO-BENEFIT	EMISSIONS	CONGESTION	EQUITY**	PUBLIC HEALTH	SAFETY	ECONOMIC VITALITY
TLU 2: Create a complete and connected active transportation network that shifts trips from automobiles to walking, biking, and other active transportation modes.						
TLU 2.1	*	*	*	*	*	*
TLU 2.2	*	*	*	*	*	*
TLU 2.3	*	*	*	*	*	*
TLU 2.4	*	*	*	*	*	*
TLU 2.5	*	*	*	*	*	*
TLU 2.6	*	*	*	*	*	*
TLU 2.7	*	*		*	*	

CO-BENEFIT	EMISSIONS	CONGESTION	EQUITY**	PUBLIC HEALTH	SAFETY	ECONOMIC VITALITY
TLU 3: Develop pricing and financing of mobility that reflects the carbon cost and efficiency of different modes and projects and correct for inequities of past investments and priorities.						
TLU 3.1	*	*	*	*	*	*
TLU 3.2	*	*	*	*	*	*
TLU 3.3	*	*			*	*
TLU 3.4	*	*	*	*	*	*
TLU 3.5	*	*	*	*	*	*
TLU 3.6	*	*	*			

 = Alignment with co-benefit

CO-BENEFIT	EMISSIONS	CONGESTION	EQUITY**	PUBLIC HEALTH	SAFETY	ECONOMIC VITALITY
TLU 4: Manage parking resources more efficiently.						
TLU 4.1	*	*	*	*	*	*
TLU 4.2	*	*	*	*	*	*
TLU 4.3	*	*	*	*	*	*
TLU 4.4	*	*	*	*	*	*
TLU 4.5	*	*	*	*	*	*
TLU 4.6			*	*	*	

CO-BENEFIT	EMISSIONS	CONGESTION	EQUITY**	PUBLIC HEALTH	SAFETY	ECONOMIC VITALITY
TLU 5: Promote job growth, housing, and other development along transit corridors.						
TLU 5.1	*	*	*	*	*	*
TLU 5.2	*	*	*	*	*	*
TLU 5.3	*	*	*	*	*	*

CO-BENEFIT	EMISSIONS	CONGESTION	EQUITY**	PUBLIC HEALTH	SAFETY	ECONOMIC VITALITY
TLU 6: Strengthen and reconnect communities by increasing density, diversity of land uses, and location efficiency.						
TLU 6.1	*	*	*	*	*	*
TLU 6.2	*	*	*	*	*	*
TLU 6.3	*	*	*			*
TLU 6.4	*	*	*	*	*	*
TLU 6.5	*	*	*	*	*	*
TLU 6.6	*	*	*	*	*	*
TLU 6.7			*	*	*	

CO-BENEFIT	EMISSIONS	CONGESTION	EQUITY**	PUBLIC HEALTH	SAFETY	ECONOMIC VITALITY
TLU 7: Where motor vehicle uses or travel is necessary, accelerate the adoption of zero-emissions vehicles (ZEV's) and other electric mobility options.						
TLU 7.1	*		*			
TLU 7.2	*		*	*		*
TLU 7.3	*			*		*
TLU 7.4	*			*		
TLU 7.5	*	*		*	*	*
TLU 7.6	*			*		*
TLU 7.7	*	*	*	*		*

Strategies Overview

The seven Transportation and Land Use strategies, and their supporting actions, must be implemented together to advance San Francisco's vision for a transformed, low carbon, healthy, and equitable city. Implementation will require public engagement and support, significant funding, and in the case of some policies, formal adoption. New concepts will require technical studies, planning, and extensive outreach.

To produce equitable outcomes, public engagement must include robust multilingual public outreach and education campaigns that help communities understand, contribute to, and navigate the transition to a low carbon system. Implementation of actions must consider and proactively strive to prevent displacement. Integral to building a robust, efficient, and safe transportation system means building one that is accessible and useful to everyone, including people with disabilities, low-income households, and marginalized communities.

Top Climate Solutions:

- Invest in public and active transportation projects
- Increase density and mixed land use near transit
- Accelerate adoption of zero emission vehicles and expansion of public charging infrastructure
- Utilize pricing levers to reduce private vehicle use and minimize congestion
- Implement and reform parking management programs



Did you know?

Co-Benefits of Climate Action:⁴³ Creating an active transportation network to shift trips from driving to walking, biking, and other low-carbon modes could result in:

VALUE OF A LIFE YEAR (VOLY) FROM INCREASED ACTIVITY

\$258 M
2030 – 2050

The mode shift toward active transport leads to significant positive health outcomes for new cyclists

REDUCED SOCIAL COSTS DUE TO REDUCED EMISSIONS

\$143,000
2030 – 2050

Fewer cars on the road means reduced air pollution and improved health outcomes.



TLU.1

STRATEGY

Build a fast and reliable transit system that will be everyone's preferred way to get around.



WHAT WOULD SUCCESS LOOK LIKE?

San Francisco has a transportation system that is reliable and affordable and makes it easy to choose public transit.



GHG REDUCTION POTENTIAL BY 2030

100,000 - 250,000 mtCO₂e



ESTIMATED COST BY 2030

\$\$\$\$\$: 500 million+



CLIMATE METRIC

Increase in transit mode share



EQUITY METRIC

TBD

COMMUNITY BENEFITS



RACIAL AND SOCIAL EQUITY**



JUST TRANSITION



HEALTH



RESILIENCE

Supporting Actions

TLU.1-1 Fund and implement the recommendations of the ConnectSF Transit Corridors Study and Muni Forward Plan, including taking steps to:

- a) Identify and implement key transit corridors for service every 5 minutes or better all day long.
- b) Ensure transit on frequent corridors is not delayed by recurring congestion by investing in transit-only lanes, signal management, queue-jump lanes and other transit priority treatments.
- c) Retime traffic lights to minimize signal delay for frequent lines.
- d) Optimize stop spacing on frequent lines to maximize transit ridership.
- e) Advance major transit capital projects, including a new Westside Subway along 19th Avenue and Geary, the Caltrain Downtown Extension, Central Subway extension, and the Link21 new transbay tube.

TLU.1-2 Improve transit reliability by bringing infrastructure into a state of good repair. Adequately fund State of Good Repair with at least \$300 million annually.

TLU.1-3 Greatly improve rider comfort, safety, and experience on transit across age, gender, race, and ability to encourage more people to ride transit. Example activities include data collection, reporting, sensitivity training of fare inspectors, and expanding the Muni Transit Assistance Program.



TLU.1-4 Implement Phase One of SFMTA’s Racial Equity Action Plan to improve working conditions and initiate the development of Phase Two in 2021 and then implement Phase Two in 2022 to improve safety, access, and opportunities for the public.

TLU.1-5 While meeting transit ridership goals, prioritize services and reduce obstacles for more vulnerable populations, neighborhoods with fewest mobility options, and populations that have faced historic disinvestment.

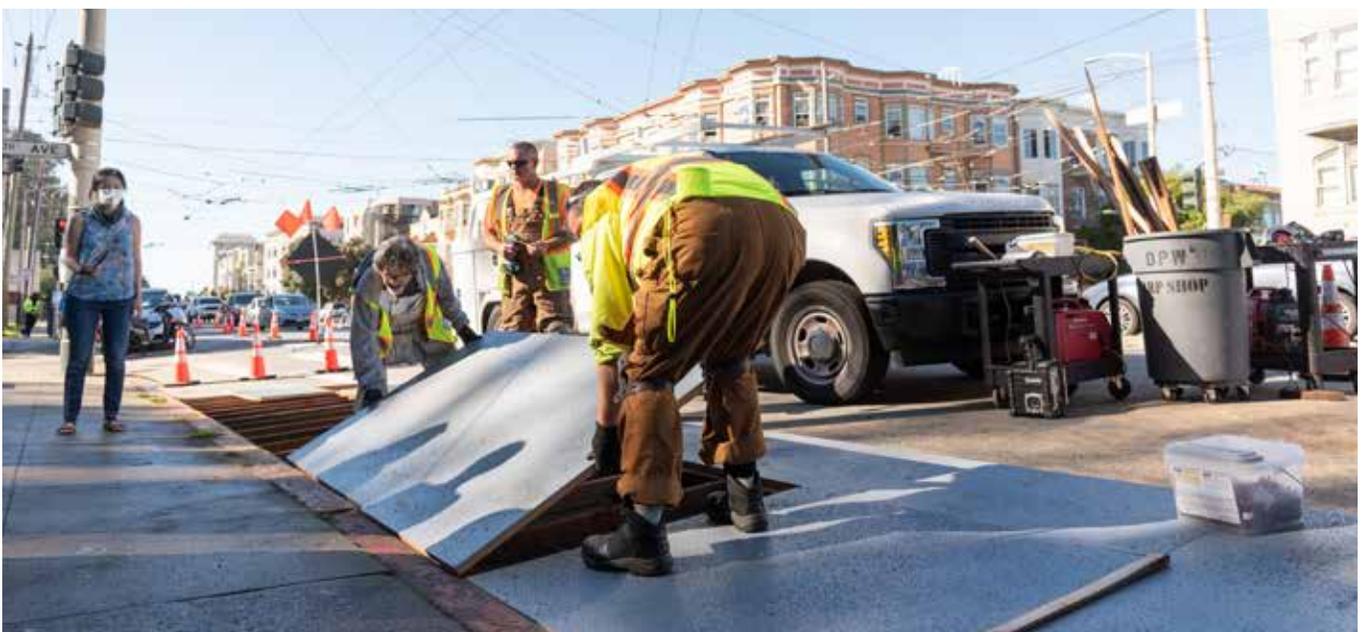
TLU.1-6 By 2025, implement 50 miles of Muni Forward transit priority improvements, including 30 miles of new transit-only lanes. to increase reliability, frequency and safety for riders.

TLU.1-7 By 2022, study the role of Muni fare programs on equity, climate, and mobility goals and adopt recommendations.

TLU.1-8 Improve connectivity between regional and local transit service by:

a) Funding targeted projects that improve physical connections and make transfers seamless between local and regional transit systems

b) Collaborating with regional partners to improve coordination between regional operators and secure funding for projects, including Caltrain Downtown Rail Extension, Caltrain Service Vision, Second Transbay Crossing, California’s State Rail Plan, and ferry projects.



Fulton Bus Bulb installation. Photo Credit: SFMTA

STRATEGY

Create a complete and connected active transportation network that shifts trips from automobiles to walking, biking, and other active transportation modes.



WHAT WOULD SUCCESS LOOK LIKE?

San Francisco has a transportation system that is reliable and affordable and makes it easy to choose active modes like walking and biking.



GHG REDUCTION POTENTIAL BY 2030

Less than 100,000 mtCO₂e



ESTIMATED COST BY 2030

\$\$\$: 10-100 million



CLIMATE METRIC

Increase in walk and bike mode share



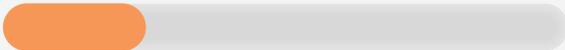
EQUITY METRIC

TBD

COMMUNITY BENEFITS



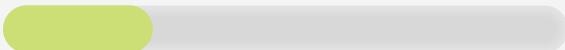
RACIAL AND SOCIAL EQUITY**



JUST TRANSITION



HEALTH



RESILIENCE

Supporting Actions

- TLU.2-1 Continue to expand programs that provide corridors that are attractive to all demographics for walking, biking, and using scooters, wheelchairs, and other small mobility devices. Connect the Slow Streets network, car-free roads in parks, and the protected bikeway network to neighborhoods in San Francisco.
- TLU.2-2 Expand community programs and partnerships to make biking more accessible, via safety and maintenance classes, community parking, and subsidies for electric bikes for low-income residents.
- TLU.2-3 By 2022, establish a modal planning framework, placing transit and active modes at the forefront, that will guide decisions about design and utilization of the City's rights-of-way.
- TLU.2-4 Expand the protected bikeway network by at least 20 miles by 2025.
- TLU.2-5 Establish and utilize design guidelines to improve connectivity and access to active transportation options at major transit stops.
- TLU.2-6 Update San Francisco's Bike Plan by 2023 to improve and expand the active transportation network with robust community input.



TLU.2-7 Encourage employers to further reduce auto commutes through incentives such as transit benefits and universal passes, e-bike incentives, active transportation support, telework policies, and carpool programs.

- a) Continue promoting Transit First initiatives and incentives for all City employees
- b) Integrate existing SFO Employee and Airline Employee BART Discount Programs



Photo Credit: SFMTA

STRATEGY

Develop pricing and financing of mobility that reflect the carbon cost and efficiency of different modes and projects and correct for inequities of past investments and priorities.



WHAT WOULD SUCCESS LOOK LIKE?

Less congested streets and a more equitable transportation system through targeted re-investment of fees, discounts, and/or incentives to help disadvantaged travelers and advance the use of low carbon modes.



GHG REDUCTION POTENTIAL BY 2030

250,000 - 400,000 mtCO₂e



ESTIMATED COST BY 2030

\$: 0-1 million



CLIMATE METRIC

Reduced vehicle miles traveled (VMT)



EQUITY METRIC

TBD

COMMUNITY BENEFITS



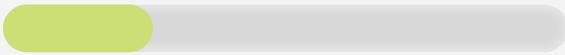
RACIAL AND SOCIAL EQUITY**



JUST TRANSITION



HEALTH



RESILIENCE

Supporting Actions

- TLU.3-1 By 2022, develop recommendations for programs and policies that will advance equity (e.g., provide discounts and exemptions for low-income individuals), reduce vehicle traffic, and increase transit service to downtown. For example, complete the Downtown San Francisco Congestion Pricing Study recommendations, and by 2026, study and implement the appropriate pricing policies.
- TLU.3-2 Advance local, regional, state, and federal opportunities to transition away from fossil fuels by increasing fees to drive.
 - a) By 2022, identify and consider pricing mechanisms that can be implemented locally (e.g. vehicle license fee).
 - b) By 2022, establish priorities to advocate for regional, state and federal legislation (e.g. increase gas tax, application of road user charges).
- TLU.3-3 By 2023, introduce new tools to manage short-term curb uses, such as flexible regulations and pricing.
- TLU.3-4 Develop and take all necessary steps to implement an integrated system of tolling for bridges and freeways and on Treasure Island to prioritize transit and higher occupancy vehicles.
- TLU.3-5 Implement the Treasure Island Mobility Management Program including new ferry service, East Bay bus service, and island tolling.
- TLU.3-6 Apply policy tools to reduce impacts on low-income and historically marginalized communities and ensure that money generated from pricing programs is invested in transportation improvements, especially for those communities.





WHAT WOULD SUCCESS LOOK LIKE?

Parking resources in San Francisco are managed in a more efficient way that better reflects our climate and transit-first priorities.



GHG REDUCTION POTENTIAL BY 2030

Enabling/Accelerating (no direct reduction)



ESTIMATED COST BY 2030

\$. 0-1 million



CLIMATE METRIC

of parking spaces and amount of curbside that is actively managed
of vehicles registered in San Francisco



EQUITY METRIC

TBD

COMMUNITY BENEFITS



RACIAL AND SOCIAL EQUITY**



JUST TRANSITION



HEALTH



RESILIENCE

Supporting Actions

- TLU.4-1 Prioritize enforcement of parking and curb regulations that impact street safety and efficiency
- TLU.4-2 Expand paid parking citywide, where appropriate Set prices at a level that reduces demand for parking so that drivers can always find a parking space near their destination.
 - a) Reinvent and expand the Residential Parking Permit program.
 - b) Expand paid hourly parking to Sundays and evenings, where appropriate.
 - c) Expand demand-responsive parking meter and garage pricing.
- TLU.4-3 Steadily reduce the City’s overall parking supply in keeping with traffic reduction and emissions reduction goals, and convert underutilized public and private parking lots, parking spaces, and garages to more productive uses, such as housing and car-free roads in parks.
- TLU.4-4 Reinvent and expand the parking tax on private parking to reduce congestion, air pollution and emissions.
- TLU.4-5 While using pricing to balance parking supply and demand, develop programs to reduce impact on low-income, auto-dependent people and ensure net benefit to low-income individuals.
- TLU.4-6 Implement a program to prioritize access and parking for people-with-disability parking placards.

STRATEGY

Promote job growth, housing, and other development along transit corridors.

Transportation & Land-Use

TLU.5



WHAT WOULD SUCCESS LOOK LIKE?

San Franciscans have access to good jobs, housing, services within a transit-accessible corridor.



GHG REDUCTION POTENTIAL BY 2030

Enabling/Accelerating (no direct reduction)



ESTIMATED COST BY 2030

\$\$: 1-10 million



CLIMATE METRIC

Reduced vehicle miles traveled (VMT)



EQUITY METRIC

TBD

Supporting Actions

- TLU.5-1 Expand housing capacity (for example, by increasing heights and removing restrictions on density) in areas where existing or new high-capacity transit is planned.
- TLU.5-2 Locate jobs close to existing or new high-capacity transit corridors.
- TLU.5-3 Use streamlined approval processes, such as Housing Sustainability Districts, in the 1/4-mile areas around major transit stations to build housing and mixed-use developments more quickly.

COMMUNITY BENEFITS



RACIAL AND SOCIAL EQUITY**



JUST TRANSITION



HEALTH



RESILIENCE

STRATEGY

Strengthen and reconnect communities by increasing density, diversity of land uses, and location efficiency.



WHAT WOULD SUCCESS LOOK LIKE?

San Francisco neighborhoods are compact and have a variety of uses (stores, services, amenities) that residents can easily access



GHG REDUCTION POTENTIAL BY 2030

Enabling/Accelerating (no direct reduction)



ESTIMATED COST BY 2030

\$\$: 1-10 million



CLIMATE METRIC

Reduced vehicles miles traveled (VMT)



EQUITY METRIC

TBD

Supporting Actions

- TLU.6-1 Facilitate the development of neighborhoods where people live within an easy walk or roll of their daily needs. Create a working group of City agencies and residents to plan and design for such neighborhoods.
- TLU.6-2 Examine rezoning to allow for multi-family housing throughout San Francisco.
- TLU.6-3 By 2023, increase the types of home-based businesses allowed in residential districts.
- TLU.6-4 Identify and reimagine under-utilized publicly owned land and roadways that could be transformed or repurposed.
- TLU.6-5 Design public space and the transportation system (including roadways) to advance racial and social equity by co-developing plans and projects with BIPOC community members and understanding their needs before designing the space.
- TLU.6-6 Update the Transportation Element of the City's General Plan.
- TLU.6-7 Design public space and the transportation system to advance disability justice by co-developing plans and projects with diverse elements of the disability community and understanding their needs before designs are complete.

COMMUNITY BENEFITS



RACIAL AND SOCIAL EQUITY**



JUST TRANSITION



HEALTH



RESILIENCE



Photo Credit: SFMTA

STRATEGY

Where motor vehicle use or travel is necessary, accelerate the adoption of zero-emissions vehicles (ZEVs) and other electric mobility options.



WHAT WOULD SUCCESS LOOK LIKE?

100% car sales by 2030 are EV's without increasing number of vehicles in SF



GHG REDUCTION POTENTIAL BY 2030

Greater than 400,000 mtCO₂e



ESTIMATED COST BY 2030

\$\$: 1-10 million



CLIMATE METRIC

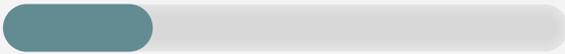
% of electric vehicles in new vehicle sales



EQUITY METRIC

community-endorsed charging infrastructure projects in communities with environmental justice burden as identified in [EJ Communities Map](#)*

COMMUNITY BENEFITS



RACIAL AND SOCIAL EQUITY**



JUST TRANSITION



HEALTH



RESILIENCE

Supporting Actions

- TLU.7-1 By 2023, launch a public awareness campaign, including messaging tailored to specific communities, with the goal of educating residents about the health, economic, and environmental benefits of transit, active transportation, and electric vehicles.
- TLU.7-2 Expand publicly available EV charging across the city that is financially and geographically accessible to low-income households and renters.
 - a) By 2022, complete an evaluation framework to develop curbside charging pilots
 - b) By 2023, expand charging to 10% of spaces in municipally owned parking lots
 - c) By 2023, expand charging to 10% of spaces within privately owned large commercial garages
 - d) By 2023, create three “fast-charging hubs” with one serving a disadvantaged community within San Francisco.
 - e) By 2025, install charging to 10% of SFO-owned parking stalls supported by load management software.
- TLU.7-3 By 2024, develop a plan to help the City’s non-revenue fleet and small and locally owned businesses build infrastructure that allows for zero emission delivery, drayage, and longer haul trucks.
- TLU.7-4 By 2023, establish a pathway to incentivize ZEVs for passenger service vehicles operating at the airport.



TLU.7-5 By 2024, launch a pilot to advance the use of ZEVs, e-bikes, and other low-carbon modes for door-to-door goods and meal delivery services.

TLU.7-6 By 2030, create incentives for the use of renewable diesel and emerging zero-emission technologies to reduce emissions from construction equipment at least 50% from 2020 levels.

TLU.7-7 Design by 2023 and launch by 2024 a pilot project to test the use of accessible bicycles, e-bicycles and e-scooters for commuting, as well as recreation.



Photo Credit: SFMTA



Housing

One of the most effective ways to reduce emissions is to ensure San Francisco has the quantity and types of affordable, accessible housing that support its diverse residents.

Dense urban environments like San Francisco offer many housing-related opportunities to reduce emissions. Providing housing to people of all incomes near services, jobs, and activities helps replace private vehicle trips with low-carbon modes such as walking, biking, and transit. Providing more housing in San Francisco makes it easier for people to live close to where they work, instead of community long distances by car.

SECTOR GOAL:

Build at least 5,000 new housing units per year with maximum affordability, including not less than 30% affordable units, and with an emphasis on retaining and rehabilitating existing housing.

To successfully reduce emissions while supporting a prosperous, inclusive, and resilient city for everyone, San Francisco must substantially increase the amount of housing available and prioritize affordability and housing options for those most at risk: BIPOC communities, people with disabilities and other vulnerable populations, as well as working-class families who have faced gentrification and economic dislocation. The CAP is coordinated with the Housing Element in the City's General Plan and other housing policy and implementation efforts developed by City agencies, in collaboration with elected officials and community members. Together, they support San Francisco's goal to build at least 5,000 housing units per year, with at least 30% of those units being affordable.⁴⁴ These goals underpin Housing strategies to implement appropriate zoning changes, streamline

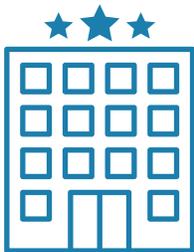
approvals, lower construction costs, and expand and sustain funding to build and preserve affordable housing.

Housing is foundational to the physical, social, and emotional health of individuals and their communities. As the world faces increasing climate, health, and economic threats, healthy and stable housing is essential for our communities to recover from shocks, build resiliency, and thrive.

CONTEXT

San Francisco's diverse job opportunities and quality-of-life amenities have attracted people and businesses for decades. Cycles of robust economic growth have created wealth and helped fund public improvements but also exacerbated inequality by putting extraordinary pressure on the city's housing stock and existing residents and communities. From 2010 to 2019, San Francisco added eight new jobs for every new home built. This disparity is due to regulatory barriers, high land and construction costs, labor shortages, and neighborhood opposition, which have constrained the financial feasibility and development of both subsidized affordable and market-rate housing.

Accomplishments



The city sheltered over **3,800 people** in Shelter in Place (SIP) hotels or trailers during COVID-19.

The city increased the number of new affordable units to

908 per year

up nearly **50%** from the prior **10** years.



The city funded 52 small and large site buildings to preserve affordability and support local businesses

From 2015 to 2019, the city increased the number of units for construction to

4,563 per year

up **61%** from the previous **10** years

“**The most important thing we can do is recognize that density isn’t a dirty word. We know that people who live in cities have a significantly lower carbon footprint than people who do not.**”

–Mayor London Breed, San Francisco

Mayor Breed has set an ambitious goal to build 5,000 new units of housing per year to make up for years of underbuilding. In the last 40 years, the City produced 5,000 units in a year just once. The last five years have seen an average of 4,200 new housing units built annually and the 30 prior years each produced fewer than 1,900 units annually. Housing availability, affordability, and accessibility disproportionately affects low- and moderate-income San Franciscans who experience higher than average housing cost burdens, over-crowding, and housing instability. Many have been displaced or forced to find cheaper housing outside the city, which can lead to long, costly, high-emissions commutes and community isolation. As with health and climate stressors, housing challenges disproportionately impact BIPOC communities, including rent burden (Figure 20). BIPOC communities

also grapple with income and housing discrimination and face resulting disparities.⁴⁵

Although many cities have seen population decline from COVID-19, including San Francisco, this may be a temporary decline. The State-mandated Regional Housing Needs Allocation is expected to increase San Francisco’s 8-year housing production target from nearly 29,000 units currently to 82,000 for the years 2023 through 2031 to address current unmet needs as well as future growth. To meet housing production targets in a manner that also supports equity and climate goals, it is also critical that new housing includes types, locations, accessibility, and affordability levels to meet the diverse needs of different households including families with children, couples, roommates, seniors, people with disabilities, and people seeking individual and group housing.⁴⁶

Thoughtfully crafted housing policies can protect existing residents, rehabilitate, and preserve existing housing, maintain affordability, increase housing production, and produce new affordable and accessible housing options for low-to-moderate income residents. Adopting such policies is essential to meeting San Francisco’s housing goals and advancing racial and social equity.



FIGURE 20: RENT BURDEN BY RACE AND ETHNICITY, 2018⁴⁷

Vulnerable and Underserved Populations

Strategies to increase housing production and affordability must prioritize and support the needs of at-risk residents, along with low-income and communities of color. In San Francisco, vulnerable populations include seniors, people with disabilities and chronic physical or mental health conditions, formerly incarcerated individuals, young adults exiting foster care or other transitional situations, people experiencing domestic violence, and people experiencing homelessness. Areas with high concentrations of people in these groups are being considered in the 2022 Housing Element currently under development. Often, these same communities are harmed by environmental injustices that exacerbate health problems, such as exposure to polluted air and water from industrial, solid waste, and congested roadways as well as insufficient access to healthy food, health services, and nature.

Furthermore, vulnerable and underserved people often experience disproportionate impacts from climate and other hazards. As the COVID-19 pandemic has shown, it is essential to connect these residents not only with services and resources, but also adequate and safe housing to ensure a resilient city. Investments in building new housing and retrofitting existing housing should be focused on underserved communities and vulnerable residents in every neighborhood.

Repairing historic injustices and improving outcomes for communities of color and low- and middle-income residents requires investing in neighborhoods with lower average incomes, including preserving

and building affordable and accessible housing, strengthening local businesses and organizations, ensuring supportive infrastructure, and creating affordable housing in higher-resource neighborhoods throughout San Francisco.

Housing Production and Affordability

To meet increased housing targets, requirements of State law,⁴⁸ and local needs and equity concerns, the City's Housing Element Update seeks to increase affordable housing in higher opportunity neighborhoods⁴⁹ to help expand choices that can enhance resident health and financial outcomes (Figure 21). Two significant challenges include securing public funding and finding available sites. Although the City has recently increased annual housing funding by hundreds of millions of dollars, local funding is variable in nature, development costs remain high, and additional State and federal affordable housing dollars are needed.⁵⁰ To increase the number of sites for housing, it is critical for the City to engage in community strategies to strategically rezone higher-resource areas of San Francisco to accommodate new multi-family housing that can serve low- and middle-income individuals and families.

Investing in existing housing, which is often more economical and can be done with lower emissions than new construction, is an important tool to complement building new housing. Importantly, retrofits also support affordable housing preservation and community stabilization for people with limited incomes. As the majority of San Francisco housing was built before 1950, structural and weatherization upgrades such as windows and insulation also help protect people from earthquakes and climate hazards such as heat waves and wildfire smoke. Retrofits also create a predictable inflection point for switching out natural gas appliances for electric ones and integrating more efficient, lower-emissions systems into existing housing stock. In addition to cutting emissions, upgrades can also improve indoor air quality to support resident health and comfort.

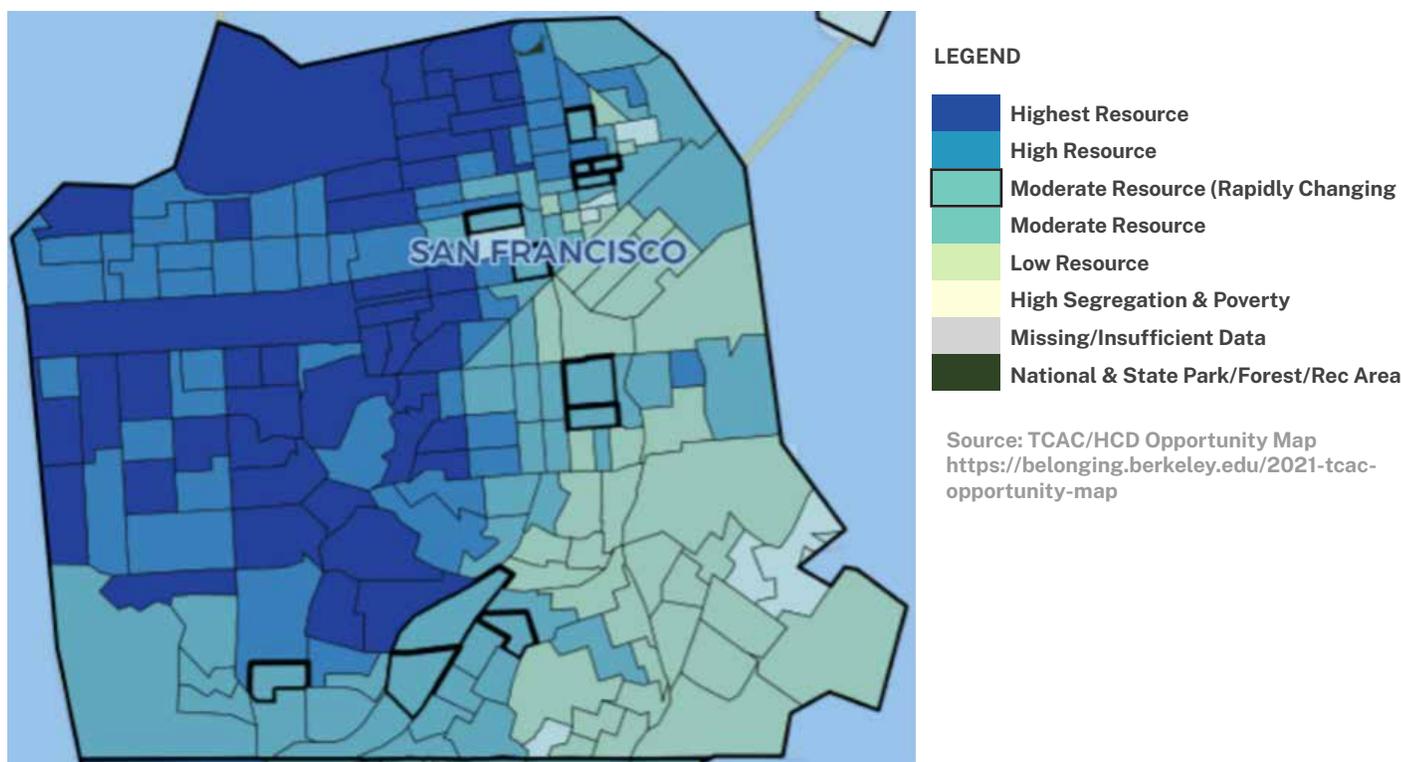


FIGURE 21: STATE OPPORTUNITY MAP BY CENSUS TRACT

Strategies Overview

The housing strategies and actions included in the Climate Action Plan are aligned with the Housing Element of the City’s General Plan, and numerous other housing policy and implementation efforts. These plans support the needed retention of existing affordable housing to ensure community stability and increase in new housing production in San Francisco, particularly affordable and accessible housing, across all neighborhoods. The City’s commitment to advancing racial and social equity, and prioritizing its vulnerable residents, is also inextricably linked to its housing policies and implementation. By both focusing resources and services in historically underserved areas and opening up affordable housing opportunities in higher-resource neighborhoods, San Francisco can leverage housing investments to build a more equitable and climate-resilient city.

Top Climate Solution:

Increase affordable compact infill housing production near transit.

H.1

STRATEGY

Anchor BIPOC families and advance their return to San Francisco through robust housing and stabilization programs.



WHAT WOULD SUCCESS LOOK LIKE?

Communities are stabilized throughout the city to the maximum extent possible, especially BIPOC and other low-and-moderate income households who have been disproportionately displaced in recent years.



GHG REDUCTION POTENTIAL BY 2030

Enabling/Accelerating (no direct reduction)



ESTIMATED COST BY 2030

\$\$\$: 10-100 million



CLIMATE METRIC

of incoming residents and # of displaced residents, annually



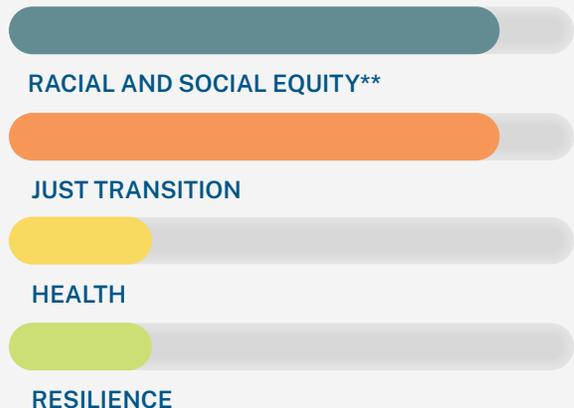
EQUITY METRIC

% BIPOC residents living in San Francisco
 % of annual incoming residents that are BIPOC
 % of displaced residents that are BIPOC annually

Supporting Actions

- H.1-1 Leverage every housing action and investment to help reverse historic dispossession based on race, ethnicity, disability, or socio-economic status, and enable housing security for affected communities.
- H.1-2 Prioritize affordable housing in cultural districts and areas with historically marginalized racial or ethnic communities to encourage their stabilization and return.
- H.1-3 Expand tenant services including education, outreach, counseling, and legal and rent assistance to keep local residents and workers housed in San Francisco.
- H.1-4 Initiate steps to increase housing production, particularly affordable and accessible housing, in higher opportunity neighborhoods that historically have been racially and economically exclusive.

COMMUNITY BENEFITS



STRATEGY

Support vulnerable populations and underserved communities through both the preservation and rehabilitation of existing housing and new housing development that serves their needs.

H.2



WHAT WOULD SUCCESS LOOK LIKE?

New housing development is built in high resource areas, and existing affordable and rent-controlled housing is rehabilitated without causing displacement. Vulnerable and underserved populations have access to both types of housing.



GHG REDUCTION POTENTIAL BY 2030

Enabling/Accelerating
(no direct reduction)



ESTIMATED COST BY 2030

\$\$\$\$: 100 million-500 million



CLIMATE METRIC

of existing residential units retrofit annually



EQUITY METRIC

% and # of new residential units serving vulnerable and underserved populations,
% and # of existing residential units rehabilitated for vulnerable and underserved populations

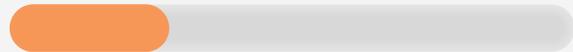
Supporting Actions

- H.2-1 Provide funding and resources to help people who are unhoused or without stable housing become and stay safely housed.
- H.2-2 Subsidize and develop incentives for building housing targeted towards vulnerable populations in high resource areas, especially along transit-rich, commercial, and social service corridors.
- H.2-3 Initiate steps to fund the acquisition and preservation of existing, affordable, multi-family housing, with a goal of at least 400 units annually.
- H.2-4 Secure federal, state, and local resources for accessibility, energy efficiency, decarbonization, and resilience upgrades in existing and new housing.

COMMUNITY BENEFITS



RACIAL AND SOCIAL EQUITY**



JUST TRANSITION



HEALTH



RESILIENCE

H.3

STRATEGY

Advance zoning and implementation improvements that support new housing production sufficient to meet goals, especially sustainable, small, mid-sized, family and workforce housing in lower density neighborhoods.



WHAT WOULD SUCCESS LOOK LIKE?

Increased percentage of San Francisco's housing production overall and affordable housing production specifically is in higher opportunity neighborhoods.



GHG REDUCTION POTENTIAL BY 2030

Enabling/Accelerating (no direct reduction)



ESTIMATED COST BY 2030

\$: 0-1 million



CLIMATE METRIC

of new housing units built proximate to transit each year, # of multi-unit projects approved in formerly R-1 and R-2 zoning



EQUITY METRIC

% BIPOC, low-, and moderate-income in higher resource neighborhoods

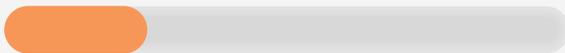
Supporting Actions

- H.3-1 Study changes to increase multi-family housing in higher-resource neighborhoods and near transit, jobs, services, parks, high quality schools, and other amenities.
- H.3-2 Develop additional approval and permit streamlining for new housing that exceeds inclusionary and sustainability requirements.
- H.3-3 Address financial and educational barriers for lower income small property owners to add housing (such as Accessory Dwelling Units) and rehabilitate existing units that are healthy and resource efficient.
- H.3-4 By 2025 establish codes and regulations that facilitate use of new materials (e.g. cross-laminated-timber) and new technology (e.g. modular housing) to lower costs and increase resource efficiency of construction.
- H.3-5 Expand green construction training and apprenticeship programs to grow the local pool of skilled labor and reduce construction costs.

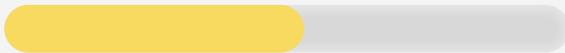
COMMUNITY BENEFITS



RACIAL AND SOCIAL EQUITY**



JUST TRANSITION



HEALTH



RESILIENCE

STRATEGY

Expand subsidized housing production and availability for low-, moderate-, and middle-income households.

H.4



WHAT WOULD SUCCESS LOOK LIKE?

The number of affordable housing units produced and preserved annually is increased compared to recent and historic averages and San Francisco achieves a higher share of its RHNA affordable housing targets than in the past.



GHG REDUCTION POTENTIAL BY 2030

Enabling/Accelerating (no direct reduction)



ESTIMATED COST BY 2030

\$\$\$\$: 100 million-500 million



CLIMATE METRIC

of new affordable housing units built proximate to transit each year, # of affordable multi-unit projects approved in formerly R-1 and R-2 zoning



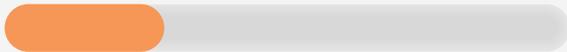
EQUITY METRIC

% new affordable housing units occupied by BIPOC

COMMUNITY BENEFITS



RACIAL AND SOCIAL EQUITY**



JUST TRANSITION



HEALTH



RESILIENCE

Supporting Actions

- H.4-1 Meet Regional Housing Needs Allocation (RHNA) targets and requirements to affirmatively further fair housing by increasing production of affordable housing, especially for families with children, in both higher resource neighborhoods and Priority Geographies that have historically been home to lower income communities of color.
- H.4-2 By 2025 renew and increase public and private funding for affordable housing as one-time bond funds and ERAF allocations are depleted.
- H.4-3 Advocate for increased regional, state, and federal funding for affordable and green housing.
- H.4-4 Identify cost cutting measures to make affordable housing developments in San Francisco more competitive for regional, state, and federal funding.
- H.4-5 Continue to prioritize surplus City, enterprise agency, and other public land for affordable housing based on timing and financial feasibility.



Responsible Production & Consumption

Climate change is driven by the global production of the goods and services that people and organizations consume. Responsible production calls for companies to rethink how they produce goods, to cut down on waste and toxics, and support consumers in making purchasing decisions that reduce emissions.

San Francisco is a leader in pursuing zero waste and reducing exposure to harmful chemicals. While continuing to advance waste reduction, reuse, recycling, composting and community health, the City must also begin to address the lifecycle impacts of the products – including both goods and services – that flow in and out of San Francisco. Purchases made in San Francisco have global ramifications, including the production and release of harmful chemicals and pollutants that impacts communities.

SECTOR GOAL:

Reduce solid waste generation 15% by 2030

Reduce disposal to landfill by 50% compared to 2015 levels

Historically, San Francisco has used a sector-based inventory to track citywide emissions. Included in this inventory are emissions from fossil fuels used in the building and transportation sectors, and methane emitted from landfills. Sector-based inventories account for downstream emissions that take place in a

given geographic area, but not the emissions generated by the creation and distribution of consumer products that go into that area. Known as upstream emissions, these can also be thought of as emissions that San Francisco outsources to other communities. In keeping with its commitment to equity and consideration of those who will be impacted the most by climate change, this plan integrates actions to reduce emissions from production and consumption, recognizing the effect local and regional purchasing decisions have all over the world. A Consumption Based Emissions Inventory (CBEI) provides San Francisco with an expanded framework to assess and act to cut emissions, while aligning other activities with climate actions goals.

Accomplishments



Mandatory Recycling and Composting Ordinance

has resulted in 99% of all properties now being compliant for recycling and composting service

The city has kept more than **2.5 million tons** of food scraps and other organics out of the landfill for over 25 years



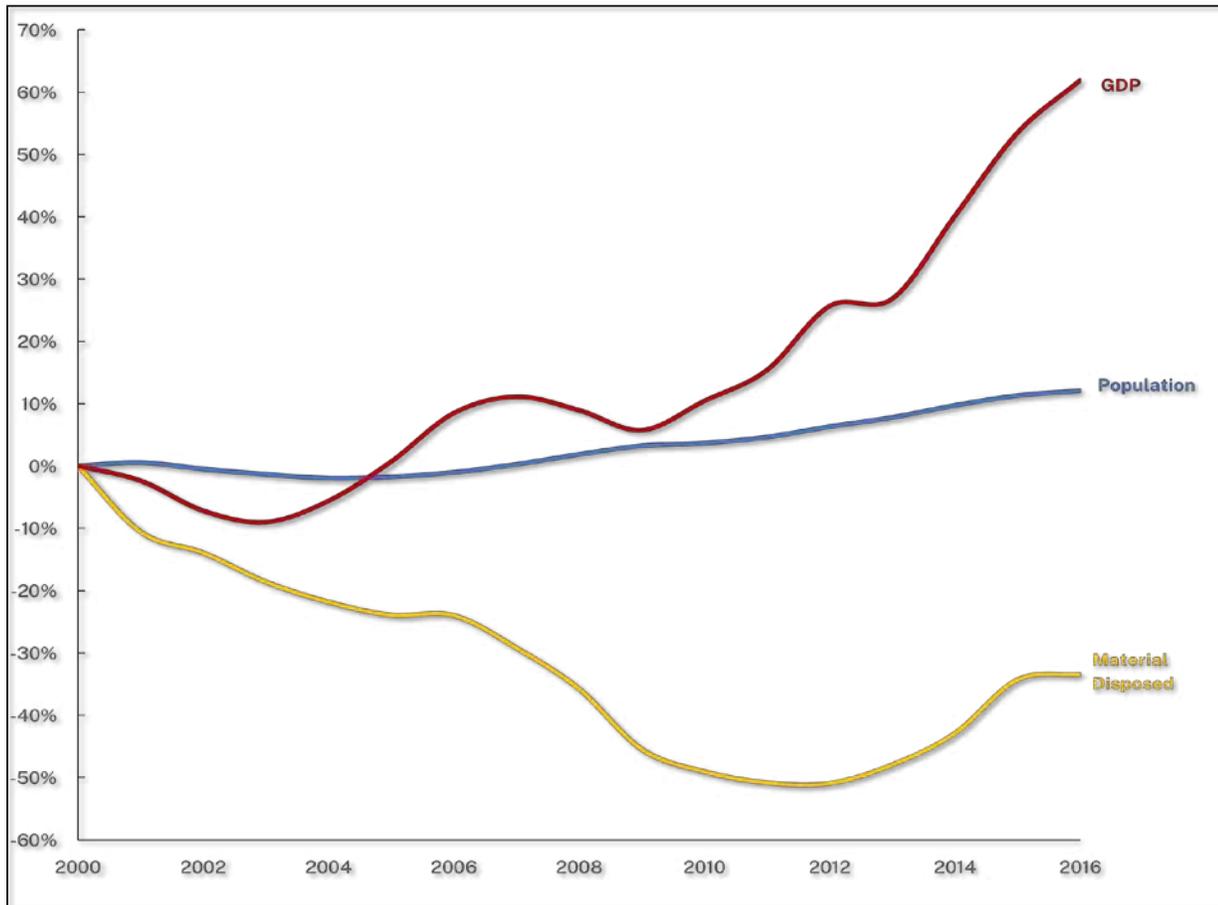
The city has kept more **3 million tons**

of recyclables out of the landfill reducing virgin resource extraction and emissions



The city keeps more than **1 million tons** per year of construction and demolition debris out of landfills recycled into products that reduces virgin resource extraction and emissions.

FIGURE 22: MATERIALS DISPOSED IN SAN FRANCISCO



Climate and the Material Lifecycle

San Francisco's ambitious zero waste goal of sending nothing to landfill or incineration has led to an increase of reuse, recycling, and composting of discarded materials. While this has decreased emissions in the waste sector, it has missed accounting for emissions from consumption, specifically the purchase of new goods and services.

While San Francisco cut the amount of disposed materials in half after 2000, a growing population, changing consumption patterns, and a building boom began to reverse that trend in 2013, when the amount of disposed materials began to increase, substantially increasing upstream emissions. Setting Responsible Production and Consumption goals can decrease these upstream emissions and negative effects on the communities impacted by them, while transforming how goods and services are produced, delivered, and used, as well as how they are then reused, recycled, composted, and disposed.

The Roles of Producers and Consumers

Reframing San Francisco's zero waste success within a climate context requires holding producers responsible for the emissions of their goods and services. In this framework, producers can be incentivized to redesign their operations to reduce emissions across their supply chain. Further, they can help consumers prioritize lower-emissions decisions. Local, state, and federal policies, along with market forces, will continue to push producers to increase efficiency and innovate sustainable materials that have lower emissions.

This framework also helps consumers — including government and households — exercise agency in their purchasing decisions and behaviors. For instance, the City can reduce consumption impacts through its own procurement policies, and can create policies, programs, and educational initiatives to support consumers. Additionally, individual households can contribute by shifting their consumption patterns and expressing demand for better, local, and low-carbon goods and services that do not outsource emissions to other communities.



Fix-It and Repair Opportunities Can Catalyze a Materials Reuse and Repair Economy

A New Call to Action

Moving forward, the City will work on reducing climate impacts of the top goods and services categories identified through the CBEI. San Francisco has long promoted climate action through behavior change: zero waste policies, programs, and educational efforts have reduced the amount of materials generated, including recyclables, compostable, as well as products that go to landfills (Figure 22). It is possible to meet these commitments and tackle a broader scope of global emissions through the production and consumption framework.

Supporting Equity and Expanding Access

Implementing responsible production and consumption strategies reduces lifecycle emissions while providing direct community benefits to San Franciscans and people from across the region and world who produce and ship goods to the city. For example, the recovery, reuse, and repurposing of resources that might go to waste, including food, used furniture, construction materials, and clothing, can be redistributed to communities in need. Further, industries that create materials and reuse and repair existing materials provide opportunities to create meaningful local jobs.

Strategies that support sourcing local and regional foods and goods can reduce emissions and air pollution related to transport. Local production also strengthens resilience. Due to the COVID-19 pandemic, some goods have become scarce as global supply chains continue to be strained. Local production can improve San Francisco's ability to adapt and respond to future pandemics and natural disasters.

Strategies Overview

Responsible Production and Consumption strategies address key product categories identified by the CBEI and seek to engage the wider community on implementation:

Building materials and construction activities

- Many building products use virgin material, which have tremendous climate impacts from extraction, production and shipping.
- Strategies aim to reduce the climate impacts of construction products and materials by promoting reusing and extending the useful life of existing buildings and their components. This also reduces waste.

Food

- Producing, shipping and wasting food generates significant global emissions.
- Strategies aim to shrink the climate impacts of the food system by reducing waste, promoting climate friendly diets, and getting excess food to those in need.

Everyday goods and consumer products

- Clothing, textiles, electronics, foodware, paper, and plastic can all drain resources and generate huge amounts of waste. They are also relatively energy intensive and therefore generate significant emissions.
- Strategies focus on promoting the reduction, reuse, repair, and recovery of a range of goods and materials.

Air travel

- Aviation and associated emissions are not included in the traditional sector-based emissions inventory. SFO International Airport plans to implement policies and programs to reduce emissions from airport fuels and operations.

Top Climate Solution:

Reduce food waste and embrace plant-rich diets.



Did you know?

Co-Benefits of Climate Action: Reducing the carbon footprint of the food system by reducing waste, promoting climate-friendly diets, and getting excess food to communities in need could result in:

REDUCED HEALTH COSTS

\$1.87M

Due to reduced food waste-related transportation emissions



Responsible Productions & Consumption

RPC.1

STRATEGY

Achieve total carbon balance across the buildings and infrastructure sectors.



WHAT WOULD SUCCESS LOOK LIKE?

By 2030 buildings constructed will have a 40% reduction in embodied carbon.



GHG REDUCTION POTENTIAL BY 2030

Not Available



ESTIMATED COST BY 2030

Not Available



CLIMATE METRIC

TBD



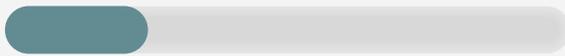
EQUITY METRIC

Tons of rescued building materials received by non-profits and small businesses in communities with environmental justice burden as identified in [EJ Communities Map](#)*

Supporting Actions

- RPC.1-1 Between 2024-2026, phase in policies to reduce embodied carbon more than 10% per project by addressing at least three product categories or building assembly types.
- RPC.1-2 By 2025, develop a suite of incentives, policies, and/or guidelines for adaptive reuse of existing buildings, as well as the design and procurement of low-carbon structural materials for new construction.
- RPC.1-3 By 2025, establish a maximum allowance for embodied carbon of buildings, to be adjusted at regular intervals.
- RPC.1-4 By 2025, amend existing policies to require deconstruction of buildings and increase the source separation of specific materials.
- RPC.1-5 By 2025, engage with designers, landlords, and lessees to develop guidelines for tenant improvement projects that reduce excess material purchases and support reuse distribution channels.
- RPC.1-6 By 2025, create a policy framework to expand and cultivate regional building material reuse markets that support workforce development, small business enterprises, and entrepreneurial innovation.
- RPC.1-7 By 2030, advance best practices for “Design for Disassembly” and “Buildings As Material Banks” by creating implementation resources in partnership with global cities, and pilot at least one municipal project to maximize the value of carbon already invested in buildings.

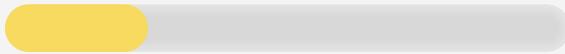
COMMUNITY BENEFITS



RACIAL AND SOCIAL EQUITY**



JUST TRANSITION



HEALTH



RESILIENCE



RETHINKING HOW WE USE COMMON BUILDING MATERIALS AND CONSTRUCTION ASSEMBLIES PRESENTS MANY OPPORTUNITIES TO REDUCE EMBODIED EMISSIONS





Responsible Productions & Consumption

RPC.2

STRATEGY

Reduce the carbon footprint of the food system by reducing waste, promoting climate friendly diets, and getting excess food to communities in need.



WHAT WOULD SUCCESS LOOK LIKE?

Amount of food waste is cut in half by 2030, sending as much as possible to communities in need.



GHG REDUCTION POTENTIAL BY 2030

Not Available



ESTIMATED COST BY 2030

\$\$: 1-10 million



CLIMATE METRIC

Tons of excess food or food scraps generated and tons of food disposed to landfill and incineration.



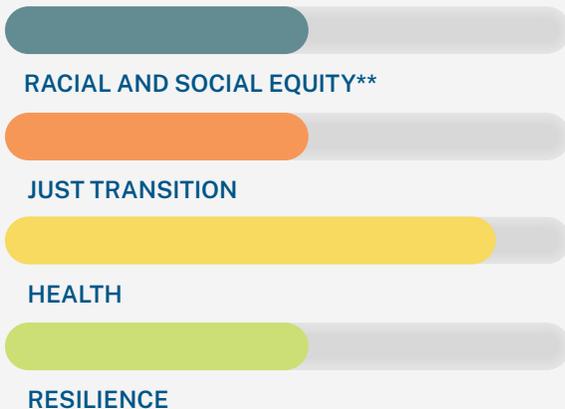
EQUITY METRIC

Tons of recovered food donated to San Francisco CBOs in communities with environmental justice burden as identified in [EJ Communities Map*](#)

Supporting Actions

- RPC.2-1 By 2030, reduce food waste by 50% in alignment with the City’s voluntary commitment to the Pacific Coast Collaborative initiative by implementing food waste reduction guidelines and recommendations in partnership with food retail, distributors, and manufacturers.
- RPC.2-2 By 2022, continue implementing and scale the Kitchen Zero SF pilot program, which reduces food waste by tracking over-purchasing by food generators, and redirects otherwise wasted food to communities in need, including providing recovered fresh produce to communities with limited access.
- RPC.2-3 By 2024, adopt a Food Waste Prevention and Edible Food Recovery policy and develop a program and incentives structure for compliance and monitoring in alignment with California’s State Bill 1383 food recovery regulations.
- RPC.2-4 By 2023, form strategic partnerships between SF Environment’s Green Business Program, City agencies, and hospitality and food industry organizations to reduce over-purchasing of food and encourage lower-carbon intense menu choices.

COMMUNITY BENEFITS





RPC.2-5 By 2024, develop guidance in partnership with other municipal agencies to implement city procurement of food in alignment with the five core values put forth by the Good Food Purchasing Program (GFPP): developing local economies, improving health, valuing the workforce, considering animal welfare, and environmental sustainability, including regenerative agriculture.

RPC.2-6 By 2025, San Francisco Department of Public Health will ensure the Zuckerberg San Francisco General and Laguna Honda Hospitals meet a 20% reduction in carbon and water footprints by implementing sustainable food purchasing standards that ensure food procurement aligns with the core values of the GFPP.

RPC.2-7 By 2030, San Francisco Unified School District will continue to build upon its adopted resolution to participate in the GFPP, aiming to procure food locally and from minority owned businesses and farms, switch entrees to lower-emissions alternatives, reduce over-purchasing of food, and donate meals to communities in need.



San Francisco-based nonprofit Farming Hope manages a garden-to-table job training program for formerly incarcerated or homeless citizens. Through the KitchenZeroSF program (RPS.2-2), they are able to receive donated surplus produce from Imperfect Produce/ Imperfect Foods for their operations.



Responsible Productions & Consumption

RPC.3



STRATEGY

Promote reduction, reuse, repair, and recovery of goods and materials.



WHAT WOULD SUCCESS LOOK LIKE?

By 2030, through a combination of policy, education and outreach, and new infrastructure solutions, San Francisco cuts its generation of discards by 15%, and the disposal of discards to landfill and incineration by 50%.



GHG REDUCTION POTENTIAL BY 2030

Not Available



ESTIMATED COST BY 2030

\$\$: 1-10 million



CLIMATE METRIC

Tons of excess non-food and non-building materials generated and tons disposed to landfill and incineration.



EQUITY METRIC

of affordable housing and small business sites that have removed or reduced contamination charges

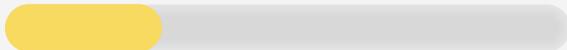
COMMUNITY BENEFITS



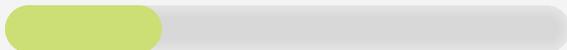
RACIAL AND SOCIAL EQUITY**



JUST TRANSITION



HEALTH



RESILIENCE

Supporting Actions

- RPC.3-1 By 2023, reduce use of non-reusable foodware by requiring, incentivizing, supporting and/or promoting reusables for on and off-site dining (to-go or delivery).
- RPC.3-2 By 2023, reduce, reuse, and repair, by requiring take-back and resale of used clothing, and promoting donation and longevity of used apparel and textiles.
- RPC.3-3 By 2024, encourage or facilitate inclusive and networked neighborhood-scale projects such as lending libraries, repair clinics, and reuse exchanges for tools, equipment, electronics, furniture and other goods that reduce production and consumption of goods.
- RPC.3-4 By 2024, expand outreach, education, and incentives for paper and plastic use reduction by supporting businesses and institutions in their transition to more reusable and plastic-free packaging and digital forms of communication; support policies to extend producer responsibility to reduce and recover packaging.
- RPC.3-5 Increase compliance with mandatory construction and demolition debris recovery (newly amended Environment Code Chapter 14) and mandatory recycling and composting (Environment Code Chapter 19) to increase recovery and reduce disposal while providing economic and social benefits such as local jobs and reduced illegal dumping.
- RPC.3-6 By 2025, advance opportunities, programs and policies within the city, neighborhoods, industrial and corporate campuses, and SFO airport to maximize material recovery.

STRATEGY

Lead the aviation sector by reducing emissions across the airline passenger journey.



Responsible Productions & Consumption

RPC.4



WHAT WOULD SUCCESS LOOK LIKE?

GHG emissions associated with all SFO ground fleet operations and landing/takeoff of aircraft have been reduced and aircraft fuels procured by air carriers are sustainable aviation fuels.



GHG REDUCTION POTENTIAL BY 2030

Not Available



ESTIMATED COST BY 2030

Not Available



CLIMATE METRIC

Gallons of Sustainable Aviation Fuels procured.



EQUITY METRIC

TBD

Supporting Actions

- RPC.4-1 SFO will encourage and incentivize, where viable, switching aviation sector fuel to low carbon sources for both air and ground fleets.
- RPC.4-2 SFO will continue its leadership and partnership with airlines to work to replace up to 50% of its fuel supply with Sustainable Aviation Fuels by 2050.
- RPC.4-3 SFO will explore how to expand its Scope 1 and 2 carbon mitigation and offset program, to also consider qualified soil carbon sequestration as well as other sequestration projects where viable and as an accepted best practice.

COMMUNITY BENEFITS



RACIAL AND SOCIAL EQUITY**



JUST TRANSITION



HEALTH



RESILIENCE



Healthy Ecosystems

Healthy ecosystems provide nature-based solutions to climate change by sequestering carbon from the atmosphere and storing it in plants, trees, and soil. Stewardship of the city’s natural resources helps restore biodiversity and provides a healthy environment that benefits all San Franciscans.

Healthy Ecosystems deploy nature-based solutions, including ecological management, restoration, urban forestry, and regenerative agriculture to sequester emissions that cannot be eliminated by actions in other sectors. Globally, nature-based climate solutions can provide 37% of the mitigation needed by 2030 to limit temperature rise.⁵¹ Urban ecosystems and nature-based solutions can offer important pathways for sequestering carbon while protecting and restoring healthy, biodiverse ecosystems, natural areas, and urban forests to ensure a nature-rich city that can be enjoyed by everyone.

SECTOR GOAL:

Continual use of nature-based solutions to sequester emissions and support biodiversity.

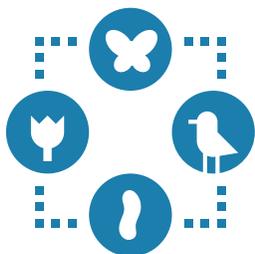
CONTEXT

The Ramaytush Ohlone, the original peoples of the San Francisco Peninsula, have lived in harmony with nature for millennia. Integrating Indigenous Traditional Ecological Knowledge into how the city’s lands, waters, and its population are cared for advances sustainability and climate goals. San Francisco has adopted plans and programs that lay actionable steps for greening the

city, restoring biodiversity, and improving community resilience.⁵² Key examples include the 2018 Biodiversity Resolution, the Significant Natural Resource Areas Management Plan, and decades of work by the San Francisco Urban Forestry Council. These plans and policies aim to increase public access to nature, protect biodiversity, and support green infrastructure and other vital ecosystem services. Healthy Ecosystems strategies and supporting actions leverage these efforts to create crucial carbon sequestration tools that will help the City meet climate goals and create other community benefits.

Beyond the 49 square miles of the city boundaries, San Francisco owns land in surrounding counties, including watershed lands that protect water supplies,

Accomplishments



Completed the pilot block installation of the

Sunset Blvd Biodiversity Master Plan

supporting SF native plants and pollinators



12 miles

of trails created through parks to enjoy nature, vistas, and views

98%

of green waste have been repurposed into landscape materials and returned to our parks



20,000

native and climate resilient plants were planted in parks in 2020

and support many rare and endangered species. Continued resource management best practices, such as grassland restoration, rare species conservation, and invasive plant management ensure these natural lands will continue to store carbon on a much larger scale than the City itself could.

Using nature-based systems to sequester carbon

Implementing ecologically regenerative agricultural practices — commonly referred to as “carbon farming” — on working lands located outside the city can serve as critical tools to mitigate climate change.⁵³ Examples of best management practices include riparian or other woody vegetation restoration to sequester carbon and help offset emissions along with fuels management to reduce the risk of high intensity wildfires to ensure that these lands continue to sequester carbon. Our scientific understanding of carbon storage capacity from natural ecosystems has become more robust and these solutions will be increasingly important to offset the emissions the City cannot eliminate completely to meet its 2040 net-zero emissions goal. However, climate change is a stressor on ecosystems and can potentially reduce their ability to sequester carbon.

For years, organic discards collected through the City’s zero waste program (“green bins”) have been used to create nutrient-rich compost which has traditionally been sold to regional agricultural operations, creating a circular flow of materials, and reducing emissions by keeping organics out of landfills where they emit methane. While still an emerging practice, studies show that applying high-quality compost to farmlands and pasturelands can significantly increase the soil’s ability to sequester carbon from the atmosphere, offering another opportunity to leverage zero waste

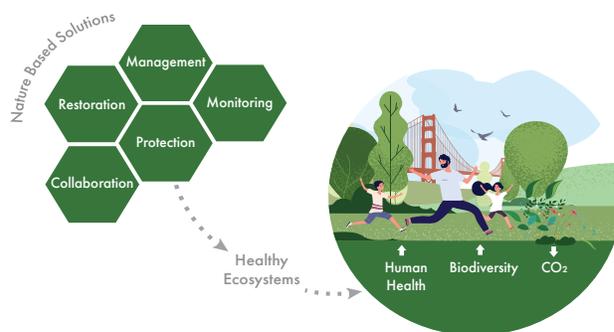


FIGURE 23: RELATIONSHIP BETWEEN HEALTHY ECOSYSTEMS, HEALTH, BIODIVERSITY, AND CLIMATE

efforts to support climate action. The City is working with external partners to study and improve compost application practices.

Climate action and biodiversity

As climate change continues to threaten all aspects of society, the Earth's biodiversity is also in crisis.^{55,54} Species are being lost at a rate 1,000 times greater than at any other time in recorded human history.⁵⁶ San Francisco is a global biodiversity hotspot, defined both by great biological diversity, and by the ongoing threat of human-caused impacts, such as expanding population and development patterns.⁵⁷ Dedicating lands and green space for carbon sequestration can restore and protect the region's undeveloped natural lands, allowing biodiversity to thrive. San Francisco's commitments to marrying biodiversity protection with climate action aligns with global efforts. State and federal governments, as well as C40, the global network of megacities, have set goals to conserve 30% of lands and coastal waters by 2030, both for robust biodiversity and to cut emissions.^{58,59}

“ **Biodiversity loss and climate change are both driven by human economic activities and mutually reinforce each other. Neither will be successfully resolved unless both are tackled together.**

-Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services & Intergovernmental Panel on Climate Change

Generating community health benefits

As San Francisco works to meet its climate goals, it can also meet the need for residents to connect to nature and enjoy safe, green places to walk, meet and build community. For instance, planting street trees sequesters carbon and can support local biodiversity, while urban forestry has many other benefits, such as clean air, cooling, stormwater management, enhancing neighborhood beauty and improving quality of life. Planting street trees also produces benefits that support other sectors; for example, by making streets more pleasant for walking, and by providing shading for buildings, which reduces the energy and associated emissions required to keep them cool.

Many studies have shown that natural environments enhance health and encourage healthy behaviors and there is a growing body of literature on the mental and physical benefits of spending time outdoors.⁶⁰ For instance, children who go to school in areas with green space tend to do better in school.⁶¹ During the pandemic, when San Franciscans were unable to gather indoors, access to greenspace was critical for community health and resilience. Healthy Ecosystems not only mitigate climate change, but also help ecosystems and communities adapt. Additionally, protecting and restoring healthy, biodiverse ecosystems, and promoting smart and equitable urban forestry ensures environmental benefits are justly distributed to all San Franciscans.

Equity and governance

To be successful, proposed healthy ecosystem strategies and activities will require extensive engagement and partnership with stakeholders, including but not limited to: BIPOC communities, agencies representing different jurisdictional boundaries, and private entities. Ongoing and future efforts must demonstrate a strong commitment to inclusive processes to ensure equitable outcomes.

While carbon sequestration and ecosystem conservation are mutually beneficial, in some situations there may be a conflict between the two goals. If, for example, a highly biodiverse California native grassland were planted with fast-growing eucalyptus trees to support sequestration goals, this would destroy the site's indigenous biodiversity and long-term ecological resilience; it could also make the landscape more susceptible to fires, which would release stored carbon. Conversely, in some cases non-native trees may be preferable for the urban landscape, as years of experience have identified species that are able to thrive in the harsh conditions of sidewalk tree planting.

Acknowledging these tensions, Healthy Ecosystems strategies and supporting actions leverage established best practices of urban greening and ecosystem restoration to clarify trade-offs and identify synergies to achieve shared goals.

Strategy Overview

San Francisco already has ambitious plans to grow its urban forest and protect its biodiversity. Healthy Ecosystems climate strategies leverage these efforts for carbon sequestration. These strategies work together by strengthening collaborations and partnerships, increasing community participation in nature-based solutions, and maximizing nature-based resources to sequester carbon.

Increasing collaboration includes strengthening relationships with American Indian organizations, federal and state governing entities and deepening ties among the City agencies engaged in this work. Healthy Ecosystem collaborators will pilot projects to gain better understanding of the carbon storage potential of San Francisco's agriculture lands.

Identifying funding streams will be crucial to the success of each interwoven strategy. Additional funding will ensure that all community members benefit from this work, especially those areas of the city that have fewer trees and less green and open space than other San Francisco neighborhoods.

Top Climate Solution:

Enhance and maintain San Francisco's urban forest and open space



Did you know?

Co-Benefits of Climate Action: Maximizing trees and other urban greening throughout the public realm can result in:

INCREASED PROPERTY VALUES

\$92M
(2021-2050)

REDUCED HEALTH CARE COST

\$422,000
(2021-2050)

HE.1



STRATEGY

Advance citywide collaboration to continually refine nature-based climate solutions that sequester carbon, restore ecosystems and conserve biodiversity.



WHAT WOULD SUCCESS LOOK LIKE?

All relevant agencies are engaged in a properly resourced collaboration that makes substantial and measureable annual progress on soil carbon sequestration and biodiversity projects.



GHG REDUCTION POTENTIAL BY 2030

Enabling/Accelerating (no direct reduction)



ESTIMATED COST BY 2030

\$: 0-1 million



CLIMATE METRIC

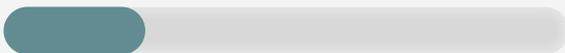
of City sequestration and biodiversity projects implemented



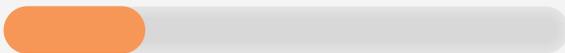
EQUITY METRIC

policies and plans evaluated and improved using racial equity tools

COMMUNITY BENEFITS



RACIAL AND SOCIAL EQUITY**



JUST TRANSITION



HEALTH



RESILIENCE

Supporting Actions

- HE.1-1 By 2022, complete the Alameda watershed carbon case study and quantify the value of carbon storage provided by protecting this natural area.
- HE.1-2 By 2022, launch the municipal soil calculator and initiate an assessment of the potential for all City owned lands to sequester carbon while maximizing indigenous biodiversity.
- HE.1-3 By 2023, City departments should develop their own policies and procedures to assess carbon sequestration opportunities for capital projects, prioritize biodiversity and green infrastructure, and maximize local native plants. Departments should work together in the Biodiversity Interagency Working Group to create shared policies and procedures where possible.
- HE.1-4 By 2025, develop best practice guidelines for improving or maintaining carbon sequestration and retention in soils, plants and natural habitats, while preserving biodiversity and ecosystem services.
- HE.1-5 By 2025, incorporate carbon sequestration and biodiversity conservation findings into a Carbon Sequestration and Ecosystem Restoration Strategy for City land and watershed management, consistent with agencies' existing plans and policies.

STRATEGY

Increase equitable community participation and perspectives in nature-based climate solutions, including meaningful efforts to prioritize Indigenous science and Traditional Ecological Knowledge.

Healthy Ecosystems

HE.2



WHAT WOULD SUCCESS LOOK LIKE?

The City will continue to provide and expand access to nature-based climate solution training, education and opportunities for all San Franciscans especially BIPOC communities.



GHG REDUCTION POTENTIAL BY 2030

Enabling/Accelerating (no direct reduction)



ESTIMATED COST BY 2030

\$\$: 1-10 million



CLIMATE METRIC

of people engaged during trainings and outreach campaigns



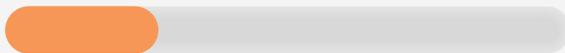
EQUITY METRIC

of acres dedicated for American Indian stewardship

COMMUNITY BENEFITS



RACIAL AND SOCIAL EQUITY**



JUST TRANSITION



HEALTH



RESILIENCE

Supporting Actions

- HE.2-1 The City will engage American Indian tribes, cultural bearers, neighborhood organizations, local businesses, the San Francisco Unified School District, and non-profit organizations during the planning and implementation of greening projects, including for the purpose of local hiring and workforce development.
- HE.2-2 By 2022, establish an inter-jurisdictional working group of American Indian representation, federal and state parks agencies, cultural districts, local non-profits, and educational and research institutions, dedicated to nature-based solutions, focused on resilience and biodiversity conservation.
- HE.2-3 The City will honor Indigenous knowledge from the original stewards of these lands (Yelamu) and create strong partnerships through meaningful engagement with the Ramaytush Ohlone and the American Indian community to participate in stewardship of lands managed by San Francisco.



STRATEGY

Restore and enhance parks, natural lands and large open spaces.



WHAT WOULD SUCCESS LOOK LIKE?

Natural lands management is fully resourced, so that existing lands can be continually improved and new lands added on an ongoing basis that are also sufficiently resourced for management and restoration.



GHG REDUCTION POTENTIAL BY 2030

Less than 100,000 mtCO₂e



ESTIMATED COST BY 2030

\$\$\$: 10-100 million



CLIMATE METRIC

of acreage improved AND restored for carbon sequestration and biodiversity.



EQUITY METRIC

% natural areas added or restored through community-endorsed processes in communities with environmental justice burden as identified in [EJ Communities Map](#)*

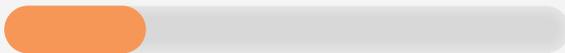
Supporting Actions

- HE.3-1 By 2030, explore expansion of the City’s natural areas preservation system through land transfers and acquisitions of undeveloped/unprotected private and public lands.
- HE.3-2 By 2030, continue improving management of existing salt marshes and explore expanding restoration acreage of degraded Bayshore properties owned by the Port and Recreation and Parks at India Basin and at Candlestick State Recreation Area.
- HE.3-3 By 2025, create a 3-acre horizontal levee at Heron’s Head Park.
- HE.3-4 By 2030, restore and create 173 acres of natural ecological parkland on Yerba Buena and Treasure Islands, including implementing the Yerba Buena Island Habitat Management Plan.
- HE.3-5 By 2030, restore 100+ acres of upland and wetland habitats at the San Bruno Jail and SFO West of Bayshore Properties.

COMMUNITY BENEFITS



RACIAL AND SOCIAL EQUITY**



JUST TRANSITION



HEALTH



RESILIENCE

STRATEGY

Optimize management of the city's entire urban forest system.

Healthy Ecosystems

HE.4



WHAT WOULD SUCCESS LOOK LIKE?

Typology-based goals and targets are fully developed and balanced with land management objectives and being carried out across the entire city.



GHG REDUCTION POTENTIAL BY 2030

Enabling/Accelerating (no direct reduction)



ESTIMATED COST BY 2030

\$\$\$: 10-100 million



CLIMATE METRIC

Plans, policies and annual monitoring are fully funded and being implemented.



EQUITY METRIC

of organizations representing BIPOC communities in plan development

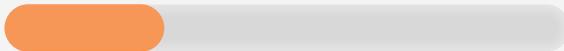
Supporting Actions

- HE.4-1 By 2023, encourage City agencies to develop guidelines for tree species selection and management procedures that incorporate community resilience, carbon sequestration, and ecosystem services and biodiversity, consistent with City agencies' strategic plans and goals.
- HE.4-2 By 2023, pending availability of resources, standardize urban forestry and greening data collection (including street tree census and canopy coverage), and complete the Urban Forest Master Plan Phases 2 (Parks and Open Space) and Phase 3 (Private Lands and Backyards).
- HE.4-3 By 2023, continue and, if applicable, expand urban wood waste diversion to maximize carbon sequestration and conserve landfill space.

COMMUNITY BENEFITS



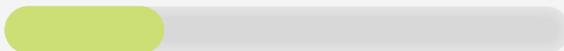
RACIAL AND SOCIAL EQUITY



JUST TRANSITION



HEALTH



RESILIENCE



STRATEGY

Maximize trees throughout the public realm.



WHAT WOULD SUCCESS LOOK LIKE?

The public realm is fully “built-out” in terms of urban forestry and community greening, so that everyone has immediate access to nearby nature.



GHG REDUCTION POTENTIAL BY 2030

Less than 100,000 mtCO₂e



ESTIMATED COST BY 2030

\$\$\$: 10-100 million



CLIMATE METRIC

Count of trees planted and area (sq ft) of public realm installed with native, climate appropriate greening.



EQUITY METRIC

% trees planted in communities with environmental justice burden as identified in [EJ Communities Map](#)*

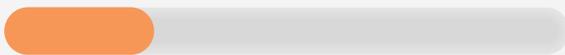
Supporting Actions

- HE.5-1 By 2040, plant 30,000 street trees in the sidewalk tree wells, approximately a 25% increase, to complete the street tree network.,
- HE.5-2 By 2030, maximize, where woody vegetation is appropriate, planting coast live oak and other native trees and arborescent shrubs throughout the entire public realm.
- HE.5-3 By 2023, create a City-managed and -dedicated street tree nursery.
- HE.5-4 By 2023, create a policy to require preservation of mature trees during development or infrastructure modifications and for planting of basal area equivalent of mature trees whose removal is unavoidable.

COMMUNITY BENEFITS



RACIAL AND SOCIAL EQUITY**



JUST TRANSITION



HEALTH



RESILIENCE

STRATEGY

Maximize greening and integration of local biodiversity into the built environment.

Healthy Ecosystems

HE.6



WHAT WOULD SUCCESS LOOK LIKE?

City and community greening in the built environment with local native plants has become routine



GHG REDUCTION POTENTIAL BY 2030

Less than 100,000 mtCO₂e



ESTIMATED COST BY 2030

\$\$\$: 10-100 million



CLIMATE METRIC

Count of acreage improved AND restored for carbon sequestration and biodiversity.



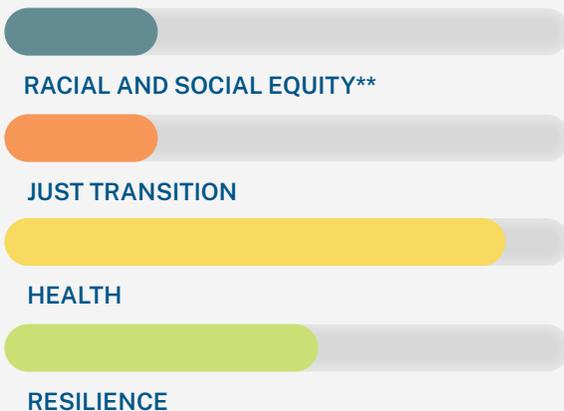
EQUITY METRIC

% incentives distributed to communities with environmental justice burden as identified in [EJ Communities Map](#)*

Supporting Actions

- HE.6-1 By 2023, establish a measurable and geographically specific target for daylighting San Francisco creeks.
- HE.6-2 By 2023, create permanent code and financial incentives for nurseries to sell local natives and for private property owners to preserve green space, protect existing mature trees and shrubs, plant local natives, and install living roofs and walls.
- HE.6-3 By 2026, maximize revegetation of degraded City and State major expressway, highway and rail corridors with hardy, low-maintenance trees and shrubs.
- HE.6-4 By 2025, create a City-owned and managed local native plant nursery that supplies plants annually to City agencies that do not currently have access to local native plants.
- HE.6-5 By 2030, maximize replacing concrete to create more biodiverse green space on public land.
- HE.6-6 By 2030, build 10 pollinator habitat landscapes at public housing sites.
- HE.6-7 By 2030, fully implement the Sunset Boulevard Biodiversity Master Plan by planting native grasses, trees and shrubs for habitat and climate resilience.
- HE.6-8 By 2030, develop and implement science-based recommendations for creating ecological corridors where feasible.

COMMUNITY BENEFITS





STRATEGY

Conduct carbon sequestration farming pilot projects and research.



WHAT WOULD SUCCESS LOOK LIKE?

Appropriate carbon sequestration projects have been piloted and have become best practice on city, private and other public owned land.



GHG REDUCTION POTENTIAL BY 2030

Less than 100,000 mtCO₂e



ESTIMATED COST BY 2030

\$\$\$: 10-100 million



CLIMATE METRIC

Appropriate carbon sequestration Acres of soil sequestration projects implemented.



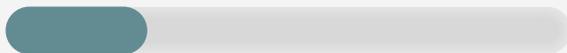
EQUITY METRIC

of projects which include Indigenous science and/or Traditional Ecological Knowledge

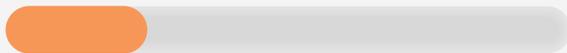
Supporting Actions

- HE.7-1 By 2024, apply approximately 500 wet tons of biosolids per year as a soil amendment and to sequester carbon on newly identified sites such as mine reclamation projects in Northern California.
- HE.7-2 Improve compliance with Mandatory Composting (Environment Code Chapter 19 and SB 1383) and optimize organics processing to increase the quantity and quality of compost produced to support soil carbon sequestration activities.
- HE.7-3 By 2030, pilot appropriate carbon sequestration techniques as part of ongoing ecological restoration of degraded habitats within SFPUC lands.
- HE.7-4 By 2025, SFO will expand its carbon mitigation and offset program to include soil carbon sequestration projects, where viable.

COMMUNITY BENEFITS



RACIAL AND SOCIAL EQUITY**



JUST TRANSITION



HEALTH



RESILIENCE



SECTION 6:

NEXT STEPS FOR IMPLEMENTING THE CAP



The CAP is a roadmap for meeting the City’s emissions reduction goals while advancing equity and other critical priorities. Successful implementation will call for government, the private sector and engaged communities to work together to address the climate emergency. Recommended actions must be carried out swiftly, efficiently, and democratically.

Meeting the challenges of climate change and implementing the CAP will call for courage and sustained commitment from political leaders, businesses, community organizations, and residents. Desired outcomes can be accelerated by strategically leveraging planned investments in energy, buildings, transit, housing, and greening efforts. Sufficient funding and expanded stakeholder engagement will be necessary to move from vision to reality.

Ongoing and transparent reporting on key performance indicators, which is to occur annually, will be critical to measure progress against goals and allow for adjustments based on changing conditions. Future CAP updates will occur once every five years and will capture new and ongoing gaps and concerns.



Community supporters gather after the Board of Supervisors vote to pass the 2019 climate emergency resolution.

LEVERAGING OTHER INVESTMENTS

The 2021 Climate Action Plan builds on decades of experience and the momentum created by complementary efforts to reduce emissions and advance equity. It reflects other plans and policy priorities, and identifies technical and financial opportunities, as well as challenges, for accelerated decarbonization.

The adoption of the CAP does not, by itself, fund or authorize implementation of any specific projects or policies, but rather provides a roadmap to achieve equitable climate goals. Although they may be included or referenced in other City plans, many of the CAP’s proposed actions will require legislative approvals. Further, any new actions will be required to undertake all appropriate legal, environmental, and technical analysis.

For example, Building Operations actions such as “BO 2-2: electrification at time of replacement,” will require extensive stakeholder engagement, legal analysis and environmental review to create new legislation. Similarly, some Transportation and Land Use actions, such as “TLU 1-1: Fund and implement the recommendations of the ConnectSF Transit Corridors Study” are sourced from distinct planning efforts, so must ultimately follow their own timelines, decision making, and approval processes in accordance with

the plans and recommendations from which they are drawn. Importantly, for any proposed action to become reality, capital and operational funding options must be vigorously explored, identified, and expanded.

FUNDING THE CAP

After CAP adoption, the City will continue working on actions that already have political authorization, fiscal support and environmental clearance; however, identifying adequate funding sources and undertaking any required technical, legal, and environmental review will be crucial for implementing other strategies. Particularly for actions where costs are borne by citizens and businesses or where federal support is lacking, efforts will be made to structure and phase in actions to control costs for private entities. However, to achieve CAP goals, investment levels must be strategically increased far beyond leveraging existing sources of funding.

These initiatives frequently rely on a multitude of funding streams made of local, regional, state, and federal sources. Securing these funds is highly competitive and often lacking, which means they may not be a dependable source to meet the City’s needs. In many cases, cities and states cannot afford to address climate change and cut emissions on their own. External support, from state and federal governments, is needed more than ever. Other challenges include the fact that

many climate actions do not have a traditional return on investment that can attract private capital. Additionally, there will always be many competing demands on limited public sector funding.

The recent commitment of City funds will be used to assess the costs of implementing specific actions, investigate various funding and financing mechanisms, and make specific recommendations for moving forward. City departments and other key stakeholders, including business and labor voices, financial advisors, and legal and policy experts will collaborate to research and analyze reliable financing models and identify the most promising options.

This process will rely on preliminary work done to outline potential funding sources and will grow to include quantifying potential funding from each source and clarifying how much implementing each strategy will cost (See **Appendix G** for full technical summary). Overall, recommended next steps include:

1. Create an interdepartmental climate finance working group to assess the economic, social, political, and administrative viability of securing new funding sources.
2. Develop a detailed cost estimate for implementing CAP actions (beyond high-level estimates in the CAP).
3. Identify all opportunities to fund CAP strategies from existing funding sources and approved measures.
4. Assess which CAP strategies are not funded or partially funded to identify funding gaps.
5. Investigate a new tax (carbon tax, food tax) and/or increase existing taxes (sales tax, property tax) as a major contributor to reducing funding gaps.
6. Seek out and apply for relevant federal, state, and local grant opportunities which can serve as important seed funding for implementing CAP strategies or other supporting activities such as community engagement or technical analysis.

MONITORING, EVALUATION, AND REPORTING (MER)

Upon completion of the CAP, the City will create and share a robust monitoring, evaluation, and reporting (MER) system that enables stakeholders to track key metrics and understand progress toward targets and goals.

SF Environment will work with key City agencies to establish a governance process, accompanied by a public facing dashboard to report on progress toward implementing the CAP. The dashboard will track climate and equity metrics, which were proposed in Section 5. The metrics are drafts and subject to change, based on multiple factors including: availability of data; introduction of better or higher quality data to quantify impacts; further engagement and discussion with additional stakeholders; and other external changing conditions. Some metrics were still being determined at the time of publication.

The MER system will follow requirements outlined in the updated Chapter 9 of the Environment Code, which calls for the City to measure and monitor sector-based emissions, including municipal emissions, as well as consumption-based emissions.

It will build on existing City data capabilities such as SFE's interactive climate storyboard, DataSF, and municipal and public sector building energy benchmarking. The system will use best practices to ensure accountability and transparency, provide relevant information to a wide range of stakeholders, and adapt as necessary. MER efforts will also serve to report on climate action progress to local, state, national, and global partners.

In addition to transparent reporting, the City government will need to show significant leadership to implement the CAP, including appropriating a budget commensurate with the need to accelerate climate investments. It will also need to speed up the delivery of projects, from planning and environmental review to procurement and construction. The City will also need to further embed climate priorities and values within policies, including education and training programs, and other governance-related activities within City government.

COST OF INACTION VS. BEING PROACTIVE

While the costs of implementing the CAP may seem daunting, there is ample research showing that the costs of not acting are several orders of magnitude greater. Communities around the country are already being financially devastated by unfolding climate disasters.

Fortunately, San Francisco continues to exhibit the political will and leadership to create financing structures that can serve as models for future action, including:

Bonds: San Francisco's Green Bonds Program was launched by the SFPUC in 2015, to fund renewable energy investments. Since that time, the City has issued almost \$2 billion in Green Bonds.

Fees: San Francisco legislated the SF Carbon Fund, which requires that 13% of the cost of airfare for municipal travel be invested in local projects that mitigate and sequester emissions. While the program is a fraction of the city's overall budget, it has been a powerful funding source for neighborhood projects.

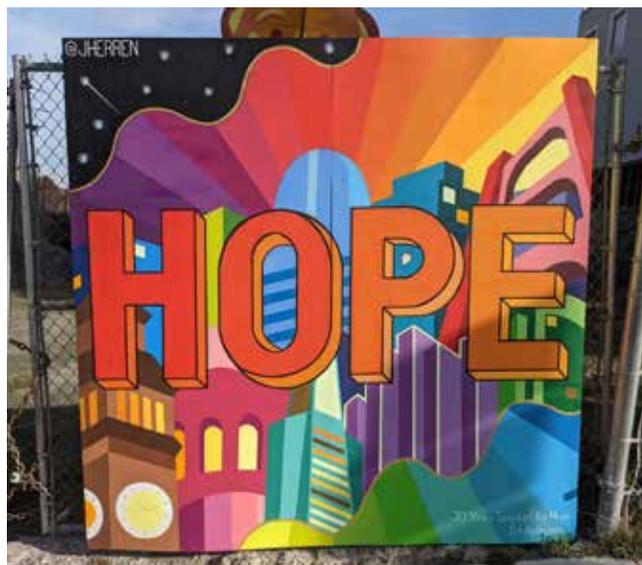
Taxes: In 2016, San Francisco voters passed the Soda Tax, which levies a small tax on distributors of sugary drinks. Revenues go toward food security, health education, and outdoor activities, all of which intersect with the city's climate mitigation and resiliency efforts.

Grants: San Francisco has secured a range of competitive grants. For example In 2019, it was awarded \$40 million from the State's Affordable Housing and Sustainable Communities Program to provide affordable housing developments designed to support public transit. And over the last decade, the City has received multiple grants from the California Energy Commission to accelerate the adoption of EVs.

Increased public awareness and participation informed by the MER system will be necessary to create active democratic participation in the CAP and will help to ensure that the city achieves the mandated emission reduction goals articulated in Chapter 9.

ADDITIONAL TOOLS FOR REACHING NET ZERO

Chapter 9 of the Environment Code defines net-zero emissions as a 90% reduction in direct GHG emissions, to be reached by 2040, with the remaining 10% removed from the atmosphere using nature-based sequestration strategies. The City is working on parallel paths to pull carbon out of the atmosphere, even as it maintains momentum to reduce its emissions. Ultimately, San Francisco could sequester many more tons of carbon than the 10% called for in the Environment Code. While City agencies do not currently quantify the carbon sequestration potential of its Healthy Ecosystems strategies, new tools are being developed that can more accurately assess each strategy and provide data to inform how to best deploy them in urban environments and on City-owned land. Areas to explore include sequestration potential of applying organic material to soils, additional tree planting, other urban greening, as well as research into new technological solutions for sequestering carbon.



One example that could serve as a model is the SF Carbon Fund, which places a surcharge on the cost of City employees' work-related air travel and invests it in local projects that mitigate and sequester emissions. Launched more than 12 years ago, the SF Carbon Fund uses widely accepted protocols to estimate emissions savings. It has created \$1.5M for city-wide community greening projects that not only sequester carbon but provide a range of other benefits such as healthy food and community gathering space.

Similar revenue-producing models could be modified and expanded to fund projects that increase carbon sequestration, soil health, and nutrient recycling. Additionally, the City's wastewater treatment facility could be designed to capture excess methane gas and convert it low-emissions biofuel for uses that maximize climate benefits. Accounting for natural systems carbon sequestration and other strategies can help bridge the gap from the current projections to the 2040 net-zero target.

ISSUES FOR FUTURE CONSIDERATION

CAP strategies must ensure that all community members, especially the most vulnerable and marginalized, have access to the health, economic, and resilience benefits of climate action. While this CAP is specifically focused on actions that reduce emissions and equitably distribute benefits, future iterations may consider action on other environmental issues to improve the delivery of critical infrastructure and maximize community health and resilience benefits of climate investments.

Addition of a disability justice lens

Climate change has been demonstrated to have both a direct and indirect impact on the effective enjoyment of a wide range of human rights, including the rights of persons with disabilities. Persons with disabilities are often among those most adversely affected in an emergency, sustaining disproportionately higher rates of morbidity and mortality, and at the same time being among those least able to have access to emergency support.⁶³

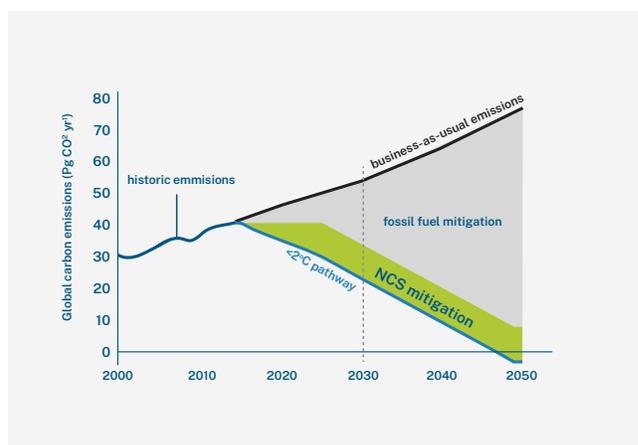


FIGURE 24: NATURE CLIMATE SOLUTIONS (NCS) CONTRIBUTION OF CARBON SEQUESTRATION TOWARDS REACHING NET ZERO EMISSIONS⁶²

Land contamination in the Southeast

During the community engagement process for developing the CAP, community members voiced strong concerns about hazardous waste and land remediation issues, particularly in the city's Bayview Hunters Point neighborhood. While not directly related to emissions reduction, these issues are important to both the city and communities in San Francisco's southeast sector, where new development on former Navy lands is growing. A number of City departments have jurisdiction over hazardous waste and land remediation issues and are rigorously working with the community to achieve long-term solutions. Future work streams have been identified to strengthen the connection between climate action, community resilience, and contamination issues. City departments will continue coordinating to:

- Secure funding to engage marginalized communities in identifying climate and environmental issues of greatest concerns to their community.
- Update the City's Hazards and Climate Resilience Plan, which identifies active and potential contaminated lands and calls out the risk of greater spills and the potential for storage infrastructure to be compromised by flooding.

- Identify funding that supports the Sea Level Rise Working Group in researching how current and former industrial uses of waterfront areas can lead to issues around soil contamination and hazardous materials that may be exacerbated by sea level rise.

Water supply, conservation, and reuse

The City must ensure an adequate and sustainable long-term water supply for the citizens of San Francisco. Over the next year, a new section will be added to the CAP that will include a Water chapter that sets goals, strategies and actions around water consumption, residential and commercial water use, and diversifying water resources, including recycled water, water reuse, purification and storage.

The Water chapter will also address wastewater issues. The process of wastewater treatment generates emissions based on the amount of organic matter, predominantly protein, that is converted into nitrous oxide and released with effluent from the City’s wastewater treatment plants. Methane, a powerful warming gas and biogas, is also released during the decay process in the City’s anaerobic digesters. Capturing this biogas can reduce the carbon intensity of wastewater treatment processes. The Water chapter will look to align the use of biogas produced from the wastewater treatment plants with the City’s Climate Action goals and develop strategies to reduce wastewater and its processing.

In developing this chapter, the SFPUC, SF Environment, and relevant stakeholders will also apply the Racial and Social Equity Assessment Tool (R-SEAT) to ensure an equity-centered approach to its development and recommendations.

BOLD, COLLECTIVE ACTION

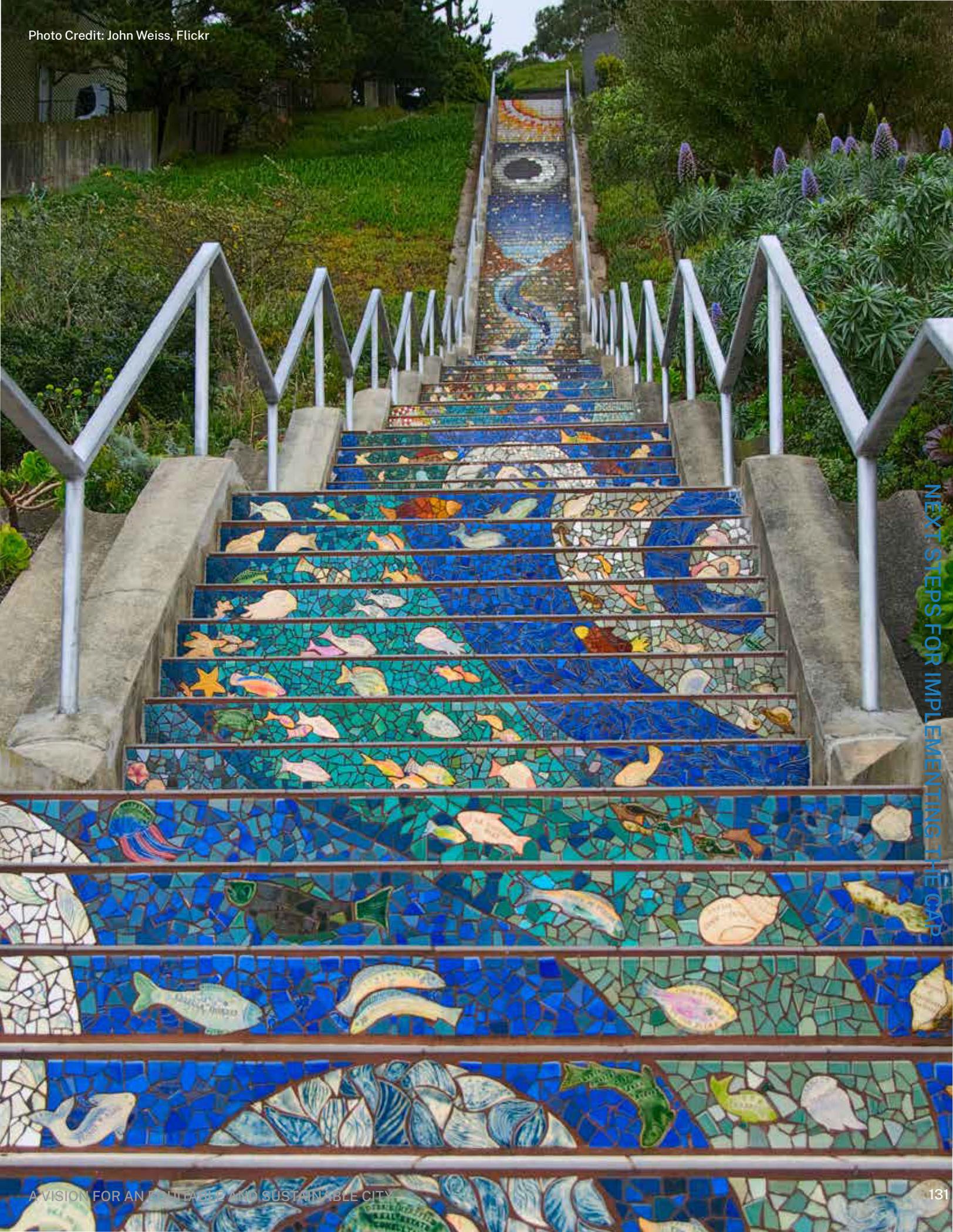
San Francisco is proud of its decades of local climate leadership, but much more action is needed. In 2021, after passionate advocacy from local stakeholders inspired to act by the unfolding climate emergency, the City allocated dedicated funding to develop a detailed analysis of the cost of CAP implementation and identify reliable funding models that would be most successful in San Francisco. It will also take steps to create a new

Climate Equity Hub to ensure San Francisco’s diverse communities are engaged in the ongoing efforts to reduce emissions and transition to a more sustainable future. While the expected initial cost of the CAP will be large, the cost and consequences of inaction would be far larger and much more harmful over time.

The CAP sets ambitious goals for San Francisco. Implementing the CAP will require deliberate policy choices from City leaders, including creating new ordinances, swiftly undertaking necessary environmental review of CAP actions, authorizing meaningful budget and investment allocations, petitioning State and Federal leaders for adequate resources, and making difficult trade-offs with other goals and priorities.

Every resident and institution in San Francisco has a role to play when it comes to building resilience and eliminating emissions. Increasing engagement and participation from more people will be crucial to making progress, particularly with BIPOC stakeholders to deliver on commitments to center equity in CAP implementation. Outreach and communications must highlight the connections between climate action and the four lenses of racial equity, health, economic justice, and community resilience. Public and private support for decarbonization policy is high, but putting it into action will require deliberate decision-making, including tradeoffs with other policy goals. The City cannot solve problems through business as usual approaches or with partial solutions. San Franciscans will need to embrace change, from new housing units to new bike lanes to new practices in our kitchens and more.

City and community leaders, local elected and appointed officials, state, regional, and federal agencies, the private sector, philanthropy, and the entire community must work together to increase climate investment, and secure commitments from all sectors to dedicate greater social, political, and financial resources toward implementing solutions that will benefit and protect us all.



NEXT STEPS FOR IMPLEMENTING THE CAP

ENDNOTES

1. On February 1, 2021 the Commission on the Environment [resolved](#) to state this land acknowledgement at the beginning of each meeting.
2. According to the [Fourth National Climate Assessment](#), annual economic losses in the United States due to climate change in 2090 (in 2015 \$): Moderate warming (RCP 4.5): \$280 billion/year; Extreme warming (RCP 8.5): \$500 billion/year
3. Public Policy Institute of California. "Income Inequality and Economic Opportunity in California" December 2020
4. Data in table is from <https://cal-adapt.org/tools/local-climate-change-snapshot/> unless otherwise noted
5. RCP 4.5 assumes emissions peak around 2040 and then decline. These emissions scenarios have been updated for the most recent IPCC report to reflect a broader range of possible emissions.
6. RCP 8.5 assumes there are no significant efforts to limit or reduce emissions. Emissions continue to rise strongly through 2050 and plateau around 2100.
7. What is considered extremely hot is location specific. Extreme heat threshold temperatures are commonly calculated as the 98th percentile of temperatures between April and October in an area. In San Francisco, an extreme heat day is 85F. By this same calculation, an extreme heat day in Sacramento is 104F.
8. Number of consecutive days with precipitation of less than 1 millimeter for each year
9. Sea level rise research used probabilistic projections, for more information see: https://opc.ca.gov/webmaster/ftp/pdf/agenda_items/20180314/Item3_Exhibit-A_OPC_SLR_Guidance-rd3.pdf
10. RCP 2.6 assumes stringent emissions reductions, with emissions declining by about 70% from 2015 to 2050, to zero by 2080, and below zero thereafter, meaning changes to land use and carbon capture technology might absorb large amounts of carbon dioxide emissions.
11. "CO2e" represents an amount of a GHG for which atmospheric impact has been standardized to that of one unit mass of carbon dioxide (CO2), based on the global warming potential (GWP) of the gas. To estimate baseline emissions and track progress, global warming potential values are used to combine emissions of various greenhouse gases into a single weighted value for emissions, commonly referenced as metric tons of carbon dioxide equivalent (mtCO2e)
12. Racial disparities described in [Ordinance to Create an Office of Racial Equity](#), July 2019
13. The Environmental Justice Communities map is based on four inputs: CalEnviroScreen, income data from the state of California, local air pollution data, and demographic data. The demographic data used for the EJ Communities map is SFDPH's Areas of Vulnerability, which includes several indicators, including race.

This is a draft version of the EJ Communities map that was released in December 2020. The San Francisco Planning Department is still in the process of gathering feedback from the general public and from other agencies. Because of this, the EJ Communities map may be revised during the fall or winter of 2021.
14. CalEPA recently issued a draft of CalEnviroScreen 4.0 (which is the most heavily weighted data source in the EJ Communities Map), so it's likely that the EJ Communities map will be updated once CES 4.0 is finalized.
14. San Francisco Health Improvement Partnership. [San Francisco Community Health Needs Assessment](#), 2019
15. American Community Survey and GeoLytics, Inc. [Bay Area Equity Atlas](#), 2019
16. San Francisco Planning Department Analysis of 2014-2018 IPUMS-USA, University of Minnesota, www.ipums.org. Underlying data from the U.S. Census Bureau.
17. 18% was supplied by nuclear which is greenhouse-gas free but not renewable.
18. Renewable energy in San Francisco is defined as solar (PV), wind, small hydro and existing large hydroelectric, geothermal, and biomass. For additional information see San Francisco's Environment Code Chapter 9.
19. San Francisco Department of Environment. [2019 GHG Emissions Inventory At a Glance Report](#). April 2021
20. CCAs provide supply where an investor-owned utility provides distribution services.
21. San Francisco Public Utilities Commission analysis looked at January 2021 enrollment status and used 2019 historical loads.
22. Disadvantaged communities are defined as the top 25% scoring areas from CalEnviroScreen along with other areas with high amounts of pollution and low populations. CalEnviroScreen is a tool developed by the CalEPA to identify communities disproportionately burdened by pollution and population characteristics that make them more sensitive to pollution.
23. San Francisco Department of the Environment. [Methane Math: How Cities Can Rethink Emissions from Natural Gas](#), 2017.
24. Co-benefit calculations are described in Appendix E.
25. Facilities identified in the City's 2017 Resilient Solar and Storage Roadmap: <https://sfenvironment.org/solar-energy-storage-for-resiliency>
26. Jobs analysis is described in Appendix F.
27. 7% percent is the average of residential, municipal, and commercial buildings
28. World Building Council, Alliance for Building and Construction and Architecture 2030.
29. Co-benefit calculations are described in Appendix E
30. This benefit is accrued outside of San Francisco because no natural gas power plants operate within its boundaries.
31. Jobs analysis is described in Appendix F
32. In July 2021, The SFMTA started to phase out the term "sustainable" in the context of modes of transportation and it has been replaced with "low-carbon." The modes included in this definition were still be evaluated during the development of this plan and updates will be posted to sfclimateaction.org when the analysis is complete.

33. ConnectSF: [2019 Statement of Needs](#): page 19-20; December 2018
 34. SFMTA. [Shelter-in-Place Allows Muni to Analyze Sources of Delay May](#) 2020.
 35. HEI Panel on the Health Effects of Traffic-Related Air Pollution. "[Traffic-Related Air Pollution: A Critical Review of the Literature on Emissions, Exposure, and Health Effects](#)" Health Effects Institute. 2010
 36. San Francisco Municipal Transportation Agency. [38-Geary Temporary Emergency Transit Lanes Project](#): Evaluation Report, May 2021
 37. Bradley, Greene, Sana, Cooper, Castiglione, Israel and Coy. "Results of the First Large-scale Survey of TNC Use in the Bay Area". Unpublished Manuscript submitted to the Transportation Research Board. August 2020
 38. San Francisco Department of Environment. [2019 GHG Emissions Inventory At a Glance Report](#). April 2021
 39. Stephen Menendian, Samir Gambhir, and Arthur Gailles, "[Racial Segregation in the San Francisco Bay Area, Part 5](#)," Othering and Belonging Institute, August 2020
 40. Michael C. Lens and Paavo Monkkonen, "[Do Strict Land Use Regulations Make Metropolitan Areas More Segregated by Income?](#)" Journal of the American Planning Association 82 (2016)
 41. Cambridge Systematics, Inc. Climate Action Plan Transportation and Land use –Climate Change Mitigation Analysis: Prepared for San Francisco County Transportation Authority. October 22, 2021
 42. Emissions reduction potential informed Cambridge Systematics, Inc Report; Other co-benefits were qualitative assessments by SFMTA & SFCTA Staff using the following definitions as guidance –Congestion: Potential to reduce vehicle miles traveled and congestion; Equity: Potential to improve access to destinations for income and marginalized communities; Public Health: Potential to improve physical fitness, air quality; mental health, ect.; Safety: Potential to improve public safety and reduces collisions; and Economic Vitality: Potential to support access to key destinations for jobs and commerce.
 43. Co-benefit calculations are described in Appendix E
 44. The City's housing production goal was first set by Mayor Ed Lee and carried forward by current Mayor London Breed. It references the 2021 Regional Housing Needs Allocation (RHNA) numbers established by the Metropolitan Transportation Commission (MTC), which sets housing targets for the nine Bay Area counties.
 45. Just 22% of American Indian householders, 23% of Black, and 24% of Latinx householders own their own homes compared to 36% of white householders and 48% of Asian householders. IPUMS data 2014-2018.
 46. Housing requires the orchestration of supportive infrastructure and services including transportation, schools, recreation and open space, civic institutions, the arts and cultural expression, health and social services, and businesses that support livelihoods and daily needs to create a sustainable neighborhood.
 47. San Francisco Planning Department Analysis of 2014-2018 IPUMS-USA, University of Minnesota, www.ipums.org. Underlying data from the U.S. Census Bureau.
 48. AB 686 and AB 1771
 49. Areas in every region of the State whose characteristics have been shown by research to support positive economic, educational, and health outcomes for low-income families – particularly long-term outcomes for children.
 50. Adding to the limitation of resources to support affordable housing, State bonds are now competitive. Each state receives an annual federal allowance of tax-exempt, private activity bonds that can be issued to support public-serving projects including affordable housing. For nearly 15 years, California had not used all of its annual bond capacity but that changed this year, forcing the state to award bonds competitively and reducing availability. Because 4% Low Income Housing Tax Credits (LIHTC) must be paired with these bonds, the limit on bond availability also effectively limits LIHTC. MOHCD's affordable housing development pipeline is likely to slow down as a result of the slowing economy and the State bond shifts.
 51. Griscom, B. W. et al, "[Natural Climate Solutions](#)." Proceedings of the National Academy of Sciences Oct 2017, 114 (44) 11645-11650; DOI: 10.1073/pnas.1710465114
 52. San Francisco Department of the Environment, [Biodiversity Policy History](#), 2018
 53. Carbon Cycle Institute, "[Carbon Farming](#)," 2021
 54. Convention on Biological Diversity, [5th Edition Global Biodiversity Outlook](#), September 2020.
 55. World Wildlife Fund, [Living Planet Report](#), 2020.
 56. United Nations Environment Program, [Spotlight on Nature and Biodiversity](#), August 2021.
 57. Conservation International, [Definition of Global Biodiversity Hotspots](#), 2021
 58. White House Administration and President Joseph R. Biden, [Executive Order on Tackling the Climate Crisis at Home and Abroad](#), January 2021.
 59. State of California Executive Department and Governor Gavin Newsom, [California Executive Order N-82-20](#), October 2020.
 60. Kardan, O., Gozdyra, P., Mistic, B. et al. "Neighborhood greenspace and health in a large urban center." Scientific Reports 5, 11610 (2015). <https://doi.org/10.1038/srep11610>
 61. Dadvand, P. et al. "Green spaces and cognitive development in primary schoolchildren." Proceedings of the National Academy of Sciences June 30, 2015; 112 (26) 7937-7942; first published June 15, 2015; <https://doi.org/10.1073/pnas.1503402112>
 62. Griscom, B. W. et al, "[Natural Climate Solutions](#)." Proceedings of the National Academy of Sciences Oct 2017, 114 (44) 11645-11650; DOI: 10.1073/pnas.1710465114
 63. Office of the High Commissioner for Human Rights (OHCHR), "[The impact of climate change on the rights of persons with disabilities](#)," 2021
- * ** The equity rating in this co-benefits slider was assigned independent of the application of the Racial and Social Equity Assessment Tool (RSEAT). More information on the RSEAT is in Appendix D

APPENDICES

GLOSSARY OF CAP TERMS

APPENDIX A

San Francisco Climate Action Plan - 2021

Glossary of Key Terms

Term	Definition <i>* From San Francisco Office of Racial Equity Citywide Racial Equity Framework</i>
Adaptive Reuse	Adaptive reuse prioritizes re-using existing sites and buildings instead of tearing down and rebuilding anew, greatly reducing the environmental impacts of development and construction.
American Indian	“American Indian” is terminology that has been commonly used by several local American Indian organizations, tribes, and community members. It is important to note however, that whenever feasible, American Indian people traditionally prefer to be identified by their tribal affiliation name (e.g. Ramaytush Ohlone). While the term American Indian is being used for purposes of uniformity in the Climate Action Plan (CAP) people should have the sovereignty and autonomy to describe themselves. Terminology used by organizations representing and serving tribal communities varies and can include American Indian, Native American, and Indigenous. ¹
Bias*	Bias is prejudgment in the evaluation of one group and its members relative to another. Acting on bias can be discriminatory and when combined with power, can create negative outcomes for particular groups. Implicit bias is when bias is unconscious, as racial bias often is. Explicit bias refers to conscious prejudice against a group or groups. When addressing bias, for example in a process or individual, the focus should not be on intent, but rather on the impact and outcomes that result.
Biodiversity	Biodiversity refers to all the different kinds of life that make up our natural world that can be found in a specific geographic area, including animals, plants, fungi, and microorganisms, such as bacteria.
BIPOC	Terms such as People of Color (often abbreviated as “POC”) and Black, Indigenous and People of Color (often abbreviated as “BIPOC”) serve to unify and affirm the parallel experiences of various individuals and diverse peoples into a collective group as a way to build power, unity, belonging and support for changes that benefit the whole group. ² Specifically naming American Indian and Black people acknowledges they have and continue to face the worst impacts of white supremacist culture. ³ When sufficient data and information are available, it is best to name specific races and ethnicities.
Buildings as Material Banks	Treating buildings as stores of valuable materials that can be reused or repurposed over time, thus reducing waste and demand for virgin resources.

¹ Definition provided by [American Indian Cultural District](#)

² San Francisco Planning Racial & Social Equity Initiative Working Definition

³ San Francisco Office of Racial Equity [Citywide Racial Equity Framework](#)

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Biosolids	Biosolids are a nutrient-rich organic material resulting from the treatment and physical separation of liquids and solids at a wastewater treatment plant. Biosolids contain essential plant nutrients and organic matter and are typically recycled as a fertilizer and soil amendment, and new research shows it can increase soil's ability to sequester carbon from the atmosphere.
Carbon	Carbon is a ubiquitous element on Earth, most of which is stored in rocks and is essentially inert on the 100's to 1000's-of-years timescales of interest to humans. The rest of Earth's carbon is stored as CO ₂ (carbon dioxide) in the atmosphere (2%), biomass in land plants and soils (5%), as fossil fuels in a variety of geologic reservoirs (8%), and as a collection of ions in the ocean (85%).
Carbon Farming	Carbon farming involves implementing advanced agricultural practices including strategic use of local, seasonal, native, and organic farming methods that are known to improve the rate at which carbon dioxide is removed from the atmosphere and converted to plant material and soil organic matter.
Carbon Footprint	A carbon footprint is the estimated amount of greenhouse gases (GHGs) emitted as a result of individual or organizational activities.
Carbon Neutral	Carbon neutral goals lead to no net release of GHGs to the atmosphere through a combination of direct emissions reductions and offsetting any remaining emissions with carbon sequestration techniques that utilize natural systems, such as tree planting and soil building.
Carbon Sequestration	Carbon sequestration is the process by which atmospheric carbon dioxide is taken up by trees, grasses, and other plants through photosynthesis and stored as carbon in biomass (trunks, branches, foliage, and roots) and soils. Carbon that is sequestered in forests and wood products helps to offset emissions sent to the atmosphere from fossil fuels, deforestation, forest fires.
Central Utility Plant (CUP)	A central utility plant (CUP) is the epicenter of the mechanical, electrical, and sometimes plumbing systems that serve a building or multiple buildings on a site.
Climate Action	Climate action means developing and implementing strategic and focused efforts to reduce GHG emissions and strengthen community resilience to climate impacts. Examples include integrating emissions reduction measures into local, state and federal policies and planning efforts, and providing targeted education, marketing, and funding for implementation of measures.
Climate Change	Climate change describes statistically significant fluctuations in average conditions, such as rainfall levels, and surface and ocean temperatures

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	measured in a region over a long period of time, that are caused by an excess build-up of human-caused carbon emissions in the atmosphere (i.e. the greenhouse effect). Other key indicators of climate change include rising sea levels, glacier loss, and dramatic changes in animal migration patterns.
Climate Pollution	Climate pollution is a general term used to describe all GHGs generated primarily from the burning of fossil fuels emitted into the atmosphere.
Community Choice Aggregation	Community Choice Aggregation (CCA) refers to local government programs that aggregate electricity demand within their jurisdictions and procure electricity on behalf of all community members, which is delivered through existing transmission and distribution infrastructure. CCAs must be enabled by state policy (AB 117 in California).
Community Solar	Community solar refers to a shared solar photovoltaic (PV) system that allows individual electricity customers without the physical means to install such a system (such as multi-unit apartment dwellers) to access a share of the clean electricity generated by that system, through a special agreement with their power provider.
Congestion Pricing	Congestion pricing is a program being explored by the SF County Transportation Authority that would charge a fee to drive downtown at rush hours to reduce traffic and achieve goals for street safety, clean air, and equity. Congestion Pricing in San Francisco would combine a fee with income-based discounts, exemptions, and incentives to make the system fair and encourage the use of sustainable transportation modes like transit, walking, and biking.
ConnectSF	ConnectSF is the city’s long-range transportation planning program, which examines future travel demand and potential transportation investments to meet this demand. ConnectSF will identify policies and major transportation investments to build an effective, equitable, and sustainable transportation system for San Francisco’s future. The program involves the SF Planning Department, SF Municipal Transportation Agency, and SF County Transportation Authority.
Consumption-based Emissions Inventory (CBEI)	Consumption-based emissions inventories, as opposed to a sector based GHG emissions inventory, use a full lifecycle accounting method that sums up the GHGs of all energy, transportation, food, goods, and services consumed by San Francisco households and governments, regardless of where they were released to the atmosphere.
Cross-laminated Timber (CLT)	Cross-laminated timber is part of a class of products known as “mass timber.” CLT, refers to any large-scale, prefabricated, solid engineered wood panel used for building construction. Lightweight yet very strong, with superior acoustic, fire, seismic, and thermal performance, CLT is also fast

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	and easy to install, generating almost no waste onsite. CLT offers design flexibility and low environmental impacts ⁴ .
Cultural competence	Cultural competence is the ability to understand, communicate with, and effectively interact with people across cultures. Grounded in the respect and appreciation of cultural differences, cultural competence is demonstrated in the attitudes, behaviors, practices, and policies of people, organizations, and systems. ⁵
Decarbonization	Decarbonization is commonly used to refer to eliminating the emissions resulting from the operation of a building, appliance, vehicle, or infrastructure. The term may also be used to refer to emissions resulting from the manufacture and distribution of material goods.
Decommissioning	Decommissioning involves withdrawing an existing asset (e.g. a building, infrastructure, or similar types of property) from service, such as by rendering it inoperable, removing it, or repurposing it.
Deconstruction	Deconstruction is the systematic dismantling and removal of a building or structure or its parts, in the reverse order of construction, to maximize the salvaging of building components that can be saved and reused for their original purpose or for better recycling.
Design for Disassembly (DfD)	Design for Disassembly (DfD) is a building design and construction process that allows for the easy recovery of products, parts, and materials when a building is disassembled or renovated in the future. DfD involves developing the assemblies, components, materials, construction techniques, and information and management systems in order to maximize economic value and minimize environmental impacts through reuse, repair, remanufacture and recycling. ⁶
Disadvantaged Communities (as identified by CalEnviroScreen)	Disadvantaged Communities (DACs) in California are geographic areas that are specifically targeted for investment of Cap & Trade proceeds. In 2012, the Legislature passed SB 535, directing that 25 percent of the proceeds from Cap & Trade revenues go to projects that benefit disadvantaged communities. Census tracts are designated as DACs by CalEnviroScreen . The term “Disadvantaged” does not describe any intrinsic characteristic of a population group, but rather a failure of society which has rendered them at a disadvantage.
Disadvantaged Worker	The CAP uses “disadvantaged worker” as a general term to describe residents who reside in areas with high rates of unemployment, have low household incomes, or face barriers to employment. Programs such as San

⁴ Source: Engineered Wood Association, <https://www.apawood.org/cross-laminated-timber>.

⁵ CSSP (2019). “Key Equity Terms and Concepts: A Glossary for Shared Understanding.” Washington, DC: Center for the Study of Social Policy. Available at: <https://cssp.org/resource/key-equity-terms-concepts/>.

⁶ Source: “Design for Disassembly (DfD) Guide, King County,” <https://kingcounty.gov/depts/dnrp/solid-waste/programs/green-building/construction-demolition/disassembly.aspx>. Authors: Brad Guy and Nicholas Ciarimboli.

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	Francisco's First Source Hiring or regional workforce development programs may have their own specific criteria for identifying disadvantaged workers.
Discrimination	Discrimination includes negative or positive actions or treatment towards members of a particular group based on their membership of that particular group. ⁷
Displacement	Residential and commercial displacement is the process by which a household or commercial tenant is forced to move from its residence or place of business. ⁸ A stable community is one that provides existing residents and businesses the choice to stay in the neighborhood rather than be forcibly displaced as change and pressures occur. ⁹
Ecological Management	Ecological management is an integrated approach to living in nature that recognizes the full array of interactions within an ecosystem, including humans, rather than considering single issues, species, or ecosystem services in isolation.
Efficient and All-Electric	Efficient and all-electric systems meet a minimum energy efficiency performance level while also transitioning away from fossil fuels to renewable electricity as the exclusive fuel source for a building, building system, or process.
EV (electric vehicle)	An electric vehicle is a motor vehicle that uses an electric motor as the basis of its operation. Such vehicles emit virtually no air pollutants.
Electrification	Electrification involves switching buildings and vehicles that currently use fossil fuels (e.g. natural gas, gasoline, and diesel) to operate on renewable electricity.
Embodied Carbon	Embodied carbon is the sum of all GHG emissions (mostly carbon dioxide) resulting from the mining, harvesting, processing, manufacturing, transportation and installation of any type of material good, but often refers specifically to building materials.
Energy Efficiency	Greater energy efficiency means using less energy to perform a task.
Environmental Justice	Environmental justice is the equitable distribution of environmental benefits and elimination of environmental burdens to promote healthy communities where all San Franciscans can thrive. Government can foster

⁷ SF Planning Racial and Social Equity Initiative Action Plan Phase I: https://default.sfplanning.org/Citywide/racial-social-equity/RSEAP_Action_Plan_Phase_1_Adopted_Dec2019.pdf

⁸ UC Berkeley Urban Displacement Project

⁹ SF Planning Community Stabilization Report 2019

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	environmental justice through processes that amend past injustices while enabling proactive, community-led solutions for the future. ¹⁰
Equity*	Equity entails full and equal access to opportunities, power and resources, whereby all people may thrive and prosper regardless of demographics.
Fast Charging Hub	A fast charging hub refers to a facility or site with multiple, publicly accessible, fast or ultra-fast charging stations for fueling electric cars and trucks.
Feed-in Tariff	A feed-in tariff is a method for paying electricity generators at a guaranteed price and fixed term. They have proven to be a useful tool to support the growth of small, local renewable electricity generation and clean energy jobs within the community.
Form-Based Zoning	Form-based zoning is a method of creating mixed-use, walkable neighborhoods which uses physical metrics and criteria (e.g. building heights, mass and set-backs with well-proportioned street and sidewalk dimensions) instead of other more conventional land use and zoning approaches (e.g. housing units/square area)
Fossil Fuels	Fossil fuels are made from decomposed plants and animals stored in the Earth’s crust and are comprised of carbon and hydrogen. Extracted from the ground in ways that are destructive to ecosystems and habitats and human health, the raw matter is then processed, refined, transported, stored, and burned for energy. Fossil fuels emit large amounts of GHGs throughout their entire lifecycle. Coal, oil, and natural gas are common examples of fossil fuels.
Gentrification	Gentrification is a process of neighborhood change that includes economic change in a historically disinvested neighborhood—by means of real estate investment and new higher-income residents moving in—as well as demographic change—not only in terms of income level, but also in terms of changes in the education level or racial make-up of residents. ¹¹ Gentrification is often used as a politicized term with different meanings depending on the context and author. ¹²
Greenhouse Gases (GHG)	Greenhouse gases (GHGs) are known climate pollutants measured or calculated to assess their impact on climate change. GHG’s include all of the following: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, and are typically expressed in the units of metric tons of carbon dioxide equivalents (mtCO ₂ e).

¹⁰ San Francisco Planning’s working definition, adapted from EJ principles from First National People of Color Environmental Leadership Summit

¹¹ Urban Displacement Project, <https://www.urbandisplacement.org/gentrification-explained>

¹² SF Planning [Community Stabilization Report](#) 2019

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Heat Pump	A heat pump is a device that moves thermal energy from one place to another via mechanical compression and evaporation. A kitchen refrigerator, which cools food by moving heat out from the inside, is a common everyday example. In the building context, heat pumps use renewable electricity instead of natural gas to provide space heating and cooling and water heating at 3 to 5 times higher efficiency.
High-Opportunity Areas	High-opportunity areas are designated census tracts with characteristics that support positive economic, educational, and health outcomes for low-income families when affordable housing is located in those areas. These characteristics include addressing racial segregation, educational attainment and achievement, income and job proximity, and environmental health. ¹³
Housing Sustainability District	Housing sustainability districts are defined by Assembly Bill No. 73 (Planning and Zoning: Housing Sustainability Districts Program, 2016) which allows a city or county to create such districts in areas with existing infrastructure and public transportation. These districts can be zoned at higher densities. An environmental impact report (EIR) is completed at the front end (e.g., time of designation), and there is streamlined review on any cases challenging the EIR. In exchange, local governments receive incentive payments from the state.
Integrated Resource Plan	An integrated resource plan forecasts the energy resources needed, typically electricity, that a utility or community choice aggregator will need to generate and deliver in order to serve its customers over a period of time.
Just Transition	Just Transition is a strategy to shift away from fossil fuels to a low-carbon future while protecting fossil fuel communities and workers, as well as communities who have historically suffered from the pollution from those industries. ¹⁴
Inclusion*	Inclusion means authentically bringing traditionally excluded individuals and/or groups into processes, activities and decision and policy making in a way that shares power. ¹⁵
Intersectionality*	Intersectionality is a concept and frame coined by Professor Kimberlé Crenshaw in 1989 that describes a lens for seeing the way in which various forms of inequality often operate together and exacerbate each other. Rather than seeing race inequality as separate from inequality based on gender, class, sexuality or immigrant status, for example, it recognizes that

¹³ California Fair Housing Task Force Methodology for the 2021 TCAC/HCD Opportunity Map December 2020, <https://belonging.berkeley.edu/2021-tcac-opportunity-map>.

¹⁴ <https://dornsife.usc.edu/eri/just-transition/>

¹⁵ Authentically bringing traditionally excluded individuals and/or groups into processes, activities, and decision/policy making in a way that shares power. OpenSource Leadership Strategies Some Working Definitions

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	some people are subject to all of these, and the experience is not just the sum of its parts. ¹⁶
Location Efficient	A building or neighborhood is location efficient when jobs, a variety of retail and services, convenient transit, and safe sidewalks and biking paths are all within close proximity.
Kitchen Zero	Kitchen Zero is a state-funded food waste prevention pilot program ¹⁷ that works with 20 institutional kitchens to install special hardware and software that aims to reduce food waste and costs while directing unused edible food to charities.
Marginalization	Marginalization is a process that occurs when members of a dominant group relegate a particular group to the edge of society by not allowing them an active voice, identity, or place for the purpose of maintaining power. ¹⁸
Modular Housing	Modular house is constructed by first building sections “off-site” using robotic assembly, then shipped to a construction site where it is put together on a foundation. When done well, this method can reduce building costs and overall construction times.
Muni Forward	Muni Forward is a program of the SF Municipal Transportation Agency, which aims to help people get around San Francisco faster, more reliably, and more safely by expanding the Muni Rapid network, making new connections, and giving Muni customers priority on congested streets.
Natural Gas	Natural gas as it is commonly known, is a flammable gaseous product primarily consisting of methane used as a source fuel for electricity generation and heating fuel for buildings. Natural gas is primarily extracted from underground hydrocarbon formations by environmentally-harmful methods such as drilling and hydraulic fracturing (“fracking”), and generates emissions that are approximately 80 times more potent than carbon dioxide throughout its refinement, transport, storage, and final delivery to power plants and consumers (via system leakage). Burning natural gas in common household appliances is known to produce harmful indoor air pollution that causes respiratory disease and increases rates of asthma. Additionally, gas plumbing poses serious fire, explosion, and public safety risks; after the 1989 earthquake, gas line ruptures may have been a factor in 34% of post-earthquake fires in San Francisco ¹⁹ .

¹⁶ Adapted from <https://time.com/5786710/kimberle-crenshaw-intersectionality/>

¹⁷ For more information about Kitchen Zero, visit: https://sfenvironment.org/sites/default/files/fliers/files/kzsf_factsheet.pdf.

¹⁸ CSSP (2019). “Key Equity Terms and Concepts: A Glossary for Shared Understanding.” Washington, DC: Center for the Study of Social Policy. Available at: <https://cssp.org/resource/key-equity-terms-concepts/>.

¹⁹ Improving Natural Gas Safety in Earthquakes, California Seismic Safety Commission (2002), see https://ssc.ca.gov/wp-content/uploads/sites/9/2020/08/cssc_2002-03_natural_gas_safety.pdf.

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Nature-based Solutions	Nature-based solutions are climate solutions inspired and supported by nature that provide social, economic, and environmental benefits. Nature-based solutions also help build resilience by supporting a range of ecosystem services (e.g. plants that help control stormwater flows) and biodiversity.
Net Metering	Net metering involves an agreement with the local utility which allows customers with a renewable energy system, such as rooftop solar panels, to exchange the value of surplus electricity generated by their system for a credit toward their bill for roughly the same amount it would cost to buy it directly from the utility.
Net Zero Emissions	Net zero emissions refers to the reduction and sequestration (removal) of GHGs from the atmosphere in a quantity equivalent to what an activity (building operations, vehicle fuels, waste disposed to landfill), or any combination of activities, emits. In the context of the San Francisco Climate Action Plan, net zero is measured against a sector-based emissions inventory. Specific to this Plan, “Building Operations” and “Transportation” refer to carbon pollution directly and indirectly emitted by operations, while “Responsible Production and Consumption” addresses life-cycle emissions from the production or consumption of goods and services. However, these emissions are not yet included in the City’s official GHG inventory since measurement is an emerging science, especially at a city scale. This term is similar to “carbon neutral” (see above).
Non-Revenue Fleet	The City’s non-revenue fleet includes any vehicle not used to generate revenue, such as trucks used in maintenance and vehicles used to transport department staff.
Protected Bike Lanes	Protected bike lanes are exclusive bicycle lanes, paths, and similar amenities that use different types of barriers (e.g. curbs, flexible delineator posts, permanent planters, other raised features, and sometimes parking) to separate bicyclists from motor vehicle traffic.
Racial Equity*	Racial equity encompasses a set of social justice practices rooted in a solid understanding and analysis of historical and present-day oppression, aiming towards a goal of fairness for all. As an outcome, achieving racial equity would mean living in a world where race is no longer a factor in the distribution of opportunity. As a process, racial equity is achieved when those most impacted by systemic racial inequities are meaningfully involved in the creation and implementation of the institutional policies and practices that impact their lives. ²⁰
Redlining	Redlining is a practice through which federal and local governments and financing entities systematically denied public and private financial services to Black and other people of color. This set of practices included

²⁰ Adapted from Anti-Oppression Resource and Training Alliance (AORTA)

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	both race and environmental factors as criteria in assessing the perceived credit-worthiness of neighborhoods and led to many of the environmental disparities we see affecting communities of color today. ²¹
Renewable Electricity	Renewable electricity is generated from renewable sources such as wind power, solar power, or hydropower. Renewable electricity produces less GHGs and has a lower environmental footprint than electricity produced from fossil fuels. ²²
Renewable Energy	Renewable energy is acquired from naturally replenishing sources such as wind power, solar power, and hydro energy. Although these sources cannot be exhausted, the ability for storage, distribution, and constant flow are limited by current resources.
Resilience	Resilience describes the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and grow, no matter what kinds of chronic stresses and acute shocks they experience. Resilience aims to bridge the gaps between social justice, sustainability, disaster recovery, and other areas. In San Francisco, the term climate resilience is being used to coordinate synergistic efforts that benefit mitigation and adaptation. ²³
R-SEAT	The Racial and Social Equity Assessment Tool (R-SEAT) was developed specifically for the San Francisco Climate Action Plan to evaluate draft strategies and actions for racial and social equity impacts, and identify opportunities to advance positive outcomes for BIPOC, low-income, and other vulnerable populations. R-SEAT was developed by Department of the Environment with critical support from the San Francisco Office Of Racial Equity, San Francisco Department of Public Health, as well as community input from People Organizing to Demand Environmental and Economic Justice (PODER) and Emerald Cities San Francisco Bay Area.
Rent Assistance	Rent assistance is financial assistance to help tenants afford rent, i.e. paying no more than 30% of income on rent. This assistance could be one-time aid or ongoing.
Responsible Production and Consumption	Responsible Production and Consumption means improving how products, goods and services acquired, used, reused, recycled, and composted to align with the United Nations Sustainable Development Goal (UNSDG) 12. ²⁴

²¹ California Environmental Protection Agency (CalEPA), [Pollution and Prejudice: Redlining and Environmental Injustice in California](#), August 16, 2021

²² Specifically, renewable electricity includes energy resources qualifying as renewable pursuant to California Public Resources Code Chapter 8.6, Section 25741(a) and California Public Utilities Code Chapter 2.3, Article 16, Section 399.16(b)(1) or (2), as amended from time to time, or provided by a local publicly owned electric utility subject to California Public Utilities Code Chapter 2.3, Article 16, Section 399.30(j), as amended from time to time.

²³ City and County of San Francisco, [Hazards and Climate Resilience Plan](#), 2020

²⁴ UNSDG 12 suggests that goods and services must meet basic human needs, be socially equitable, minimize environmental impacts over their lifecycle to match the carrying capacity of the earth’s resources and not jeopardize present and future generations.

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Sector	Sectors refer to the six areas of the Climate Action Plan, which align with and address the City’s sources of climate pollution, informed by the annual citywide GHG inventory, the Consumption Based Emissions Inventory (CBEI), and existing sustainability and climate action policy and program goals and frameworks.
Sector-based, or Conventional Greenhouse Gas (GHG) Emissions Inventory	Sector-based emissions inventories are the typical method cities use to account for greenhouse gases (GHGs) emitted within their geographic/geopolitical jurisdiction. As opposed to the consumption-based emissions inventory (CBEI, see above), sector-based GHGs include only emissions generated within the geographic boundary and administrative control of the City and County of San Francisco.
Slow Streets	Slow Streets is a program started by the San Francisco Municipal Transportation Agency (SFMTA) which limits vehicle through-traffic on designated residential streets to encourage safer walking and bike use, allowing people to exercise and recreate in their own neighborhoods. The program has designated at least 30 corridors as Slow Streets.
Social equity	Social equity is fairness and justice in the management of public institutions, forming of policy and delivery of public services, taking into account historical and current inequities among groups, such as along gender identity, sex, religion, and disability status. ²⁵
Strategies	In this Climate Action Plan, Strategies refer to the activities designed to achieve a major or overall goal for a Sector. Each Strategy was developed with consideration of the social, economic, policy, data, and governance factors that can inhibit and/or contribute to success.
Supporting Actions	Supporting Actions in the Climate Action Plan are the specific steps that will help achieve the overarching Strategy, which may include any combination of policies, programs, outreach, education, or similar activities.
Low-carbon modes	Low-carbon modes are ways to travel and get around – such as walking, biking, and taking transit – that generate less greenhouse emissions while advancing other critical city priorities including health, safety, equity, and economic vitality.
Systemic racism*	Systemic racism is the joint operation of institutions to produce racialized outcomes, even in the absence of racist intent. Indicators include power inequalities, unequal access to opportunities, and differing policy outcomes by race. Systemic racism is cumulative, pervasive, and durable.
Transit Corridors Study	The City’s Transit Corridors Study is part of an investment strategy to assess where major transit capital infrastructure will be made in San Francisco in the medium- and long-term horizon.

²⁵ San Francisco Planning Racial & Social Equity Initiative Working Definition

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TNC	Transportation Network Companies (TNC) are also known as “ride-hailing” or “ride sharing applications” which people usually access via their phones to order a ride in a private car.
Traditional Ecological Knowledge	Traditional Ecological Knowledge (or TEK) refers to the evolving knowledge acquired by Indigenous and local peoples over hundreds or thousands of years through direct contact with the environment. This knowledge is specific to a location and includes the relationships between plants, animals, natural phenomena, and the landscape that are used for lifeways, such as hunting, fishing, trapping, agriculture, and forestry. TEK is an accumulating body of knowledge, practice, and belief, that encompasses the world view of Indigenous people which includes ecology, spirituality, human and animal relationships, and more. ²⁶
Transmission and Distribution	Transmission and distribution include physical and/or information infrastructure that facilitates the transfer of energy from a generation and/or refining source to where it is consumed. Transmission refers to bulk transfer, such as wholesale delivery of electricity serving an area or region, while distribution refers to the transfer of energy to retail customers, such as individual homes.
Vulnerable Populations	<p>“Vulnerable Populations” is an imperfect term which attempts to describe a variety of complicated issues. The specific populations groups encompassed by the term vary from issue to issue. ‘Vulnerable Populations’ does not describe any intrinsic characteristic of a population group, but rather a failure of society which has rendered them vulnerable. Vulnerable populations in the R-SEAT are defined as: older adults, youth, homeless or marginally housed residents, non-English speaking people, immigrants, people with disabilities, people who are socially isolated, and people with pre-existing health conditions.</p> <p>Vulnerable populations in the Housing chapter include seniors, people with disabilities and/or chronic physical or mental health conditions, formerly incarcerated individuals, young adults exiting foster care or other transitional situations, those experiencing domestic violence, and, most visibly, people experiencing homelessness. The Housing sector also uses the term underserved populations to describe those at risk of homelessness, such as the lowest income, and residents of supportive housing buildings.</p>
White Supremacy*	White supremacy is a historically based, institutionally perpetuated system of exploitation and oppression of continents, nations, and peoples of color by white peoples and nations of the European continent for the purpose of maintaining and defending a system of wealth, power, and privilege. ²⁷

²⁶ <http://climate.calcommons.org/article/tek>

²⁷ Sharon Martinas and the Challenging White Supremacy Workshop, 4th revision (1995). MP Associates and Center for Assessment and Policy Development. (2013). www.racialequitytools.org glossary (PDF). Retrieved from http://www.racialequitytools.org/images/uploads/RET_Glossary913L.pdf

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ZEV (zero emission vehicle)	Vehicles which produce no emissions from the on-board source of power. Examples include regular bicycles, and electric bikes (e-bikes), scooters and cars that use 100% renewable electricity.
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COMMUNITY ENGAGEMENT MATERIALS

APPENDIX B



Appendix B-1

San Francisco Climate Action Plan Public Feedback Summary

April 27, 2021

Introduction

This document summarizes public comments received on the draft San Francisco Climate Action Plan (Plan). Specifically, this summary includes public comments collected between December 18, 2020 and March 26, 2021 through the following methods:

- Interactive online open house
- Online survey
- Online workshops
- Pop-up presentations
- Email and phone communication

For detailed responses and feedback, please see supporting documents.

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PUBLIC ENGAGEMENT OBJECTIVES

The public engagement aimed to achieve the following goals and objectives:

Goal	Promote community awareness and knowledge of climate concepts and City climate activities.
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A	Objective	Increase awareness of climate impacts and San Francisco’s climate, planning, and resilience programs.
	Objective	Convey how climate action, resilience, and equity intersect.
Goal	Build community understanding and support for the City’s long-term climate vision and actionable Plan policies.	
B	Objective	Clearly communicate the Plan’s focus, boundaries, and intended use, as well as the roles the community and City play in reducing GHG emissions.
	Objective	Clarify that Plan strategies are designed to meet emissions targets in the Chapter 9 environment code and are well-vetted and prioritized.
Goal	Engage and empower stakeholders to both provide feedback and help with Plan implementation.	
C	Objective	Provide opportunities for community members to voice their priorities, concerns, and expectations for implementation strategies.
	Objective	Recruit a diverse and committed group of people that are willing to stay involved in Plan implementation.
	Objective	Consider and incorporate community input around implementation into the final Plan so that residents feel ownership of the Plan and strongly buy into the actions.
Goal	Ensure that equity is a core value reflected within the final CAP.	
D	Objective	Solicit feedback about opportunities to advance equity within implementation of Plan strategies.
	Objective	Ensure that opportunities to provide feedback are accessible and equitable to community members across demographic indicators such as gender, age, race, ethnicity, language, income, geographic location, immigration status, and access to internet or wifi.

PUBLIC ENGAGEMENT ACTIVITIES

Throughout this engagement process, a combination of targeted and broad outreach strategies were utilized to reach priority audiences and the general public, respectively (see more information on each method below):

- **Targeted outreach strategies** included amplified outreach through the Community Climate Council, geographically focused and non-English workshops, pop-up presentations, and translated versions of online open house materials and the public online survey.
- **Outreach to the general public** consisted of an online open house, online survey, online workshop series, and phone and email communication.

Participation was promoted at all online workshops, the SFE webpage, and physical flyers distributed throughout San Francisco neighborhoods and underserved communities. Participation in online workshops specifically was promoted through Eventbrite, the SFE webpage, and various social media platforms.

Community Climate Council

The Community Climate Council (CCC) consisted of 11 recruited leaders from San Francisco community-based organizations representing a range of target demographics and stakeholder



groups. Coordination with the CCC was maintained throughout the engagement process, starting with buy-in on the engagement strategies and messaging. An outreach toolkit and training were provided to the CCC members to assist members with engaging contacts, with an emphasis on community members who are typically not involved in public processes or are unlikely to take a survey. The toolkit included Plan factsheets, instructions and talking points, a recorded Plan overview presentation, a briefing PowerPoint Presentation, and a social media strategy.

SFE Webpage

Housed on the SFEEnvironment.org website, the SFE webpage was a central hub of information and an on-going resource to the public. The webpage acted as a go-to landing page for the public to learn about the planning process and ways to get involved.

Key information:

- URL: sfenvironment.org/ClimatePlan

Online Open House

The online open house, housed on the Konveio web platform, provided an opportunity for community members to provide their input on the draft Plan. The online format removed barriers so that participants could provide feedback at a time that is convenient for them and take their time digesting materials. The online open house also housed the online survey (detailed in the section below).

Key information:

- URL: sfclimateaction.konveio.com
- Live for public commenting: December 18, 2020 - March 26, 2021
- Website remains accessible to the public to review draft Plan documents.

Online Surveys

The online survey was housed within the online open house platform and was open through the duration of the online open house. The survey was translated into Spanish and Chinese (and other languages through Google Translate) and included questions regarding Plan strategy/actions, City and community roles, equity, and respondent demographics. Participation in the online survey provided an entry into a raffle for a \$100 Visa Gift card to encourage participation.

Online Workshops

One kick-off webinar and eleven interactive online workshops were held from December 2020 through March 2021 to introduce Plan strategies/actions and gather feedback on Plan content and implementation. Nine workshops were hosted in English, one was hosted in Spanish, and one in Cantonese.



These workshops took place via Zoom during different days of the week and times of the day to foster diverse participation. The workshops typically consisted of a guest speaker, a brief overview presentation of the Plan and Plan process, interactive polls and chat questions, breakout sessions to promote collaborative feedback on Plan strategies and actions.

WS#	Workshop	Date and Time
WS1	Climate & Business	Wed, Dec 9, 2020, 10:00 a.m. -12:00 p.m. PST
--	Kick-off Webinar	Thu, Jan 14, 2021, 5:00-6:30 p.m. PST
WS2	General Workshop Co-hosted with SPUR	Wed, Jan 20, 2021, 12:30-2:30 p.m. PST
WS3	Community Climate Workshop	Thu, Jan 21, 2021, 5:30-7:00 p.m. PST
WS4	Climate & Economy	Wed, Jan 27, 2021, 5:30-7:00 p.m. PST
WS5	Climate & Equity	Tue, Feb 2, 2021, 6:00-7:30 p.m. PST
WS6	Climate & Health	Tue, Feb 9, 2021, 5:30-7:00 p.m. PST
WS7	Climate & Resilience	Thu, Feb 18, 2021, 5:30-7:00 p.m. PST
WS8	Spanish In-language	Tue, Mar 9, 2021, 6:00-7:30 p.m. PST
WS9	Chinese In-language	Thu, March 11, 2021, 6:00-7:30 p.m. PST
WS10	Community Climate Workshop	Fri, Mar 19, 2021, 12:30-2:00 p.m. PST
WS11	Community Climate Workshop	Sat, Mar 20, 2021, 10:00-11:30 a.m. PST

Pop-up Presentations

To engage interested local organizations, SFE offered to host small presentations to inform about the Plan and gather community feedback. Eleven pop-up presentations were held between February 24, 2021 through March 16, 2021 for the following organizations:

- Bayview Hunters Point Environmental Justice Taskforce
- Building Owners and Managers Association (BOMA) San Francisco
- CNPS Yerba Buena, Golden Gate Audubon Society, California Academy of Sciences, Nature in the City, Wildfires to Wildflowers, San Francisco Estuary Institute Urban Nature Lab, Sutro Stewards, Presidio Trust, Literacy for Environmental Justice, Farallon Islands Foundation, Designintent Landscape Architects
- Japantown Task Force
- Pacific Heights Residents Association
- SF Yimby, Urban Environmentalists
- SFUSD Balboa High School - 12th Grade Environmental Science Class
- SFUSD BIPOC Climate Justice Council
- SFUSD Lincoln High School - 10th Grade Green Academy
- Sunrise Movement - Bay Area Hub
- Zero Waste Youth USA



Email and Phone Communication

For those who were not able to join an online workshop and/or participate in the online open house, a phone number and email was provided to answer any questions or receive any feedback. SFE assigned staff to respond to inquiries in English, Spanish, and Chinese throughout the engagement period.

- climate@sfenvironment.org
- (415) 409-8228

Nine emailed letters were received from the following stakeholder groups:

- Alameda County Waste Management Authority (StopWaste)
- Bayview Hunters Point Mothers & Fathers Committee Greenaction for Health and Environmental Justice
- Building Owners and Managers Association (BOMA) San Francisco
- Collaborative letter from Golden Gate Audubon Society, Nature in the City, Wildfires to Wildflowers, and Yerba Buena Chapter of the California Native Plant Society
- Livable City
- Nature in the City
- San Francisco Transit Riders
- Wildfires to Wildflowers
- Yerba Buena Chapter of the California Native Plant Society

No phone calls were received during the engagement process.

Engagement Overview

PARTICIPANT SUMMARY

Through the platforms and methods of engagement below, **238,845 people were reached** during this engagement (saw postings/landed on pages). Of the people reached, **5,777 people were engaged** during this process (took the survey, attended an online workshop, interacted with social media content, etc.). Note that these totals represent total interactions and may double count individuals that engaged across multiple platforms.

Method	# Reached	# Engaged
Online survey	2,078	800
Online open house	12,285	1,405
Workshops + Pop-ups	1,793	1,448
Social media	220,642	1,829
City webpage	4,143	419
Email communications	389	61
Total	241,330	5,962

WORKSHOP AND POP-UP PRESENTATIONS SUMMARY

Many participants attended the kick-off webinar via Zoom or Facebook live (50% of total attendance). Among interactive workshops, the Climate & Resilience workshop received the most registrants and the Climate & Equity workshop was most highly attended. Twenty eight percent of workshop attendees responded to the demographic survey.

Workshop	Attendees	Registrants	Attendance Rate	# Responded to Dem. Survey	% Responded to Dem. Survey
Kick-off Webinar	652*	543**	120%	N/A	N/A
Business	18	18	100%	14	78%
SPUR	64	128	50%	21	33%
General	24	45	53%	8	33%
Climate & Economy	70	99	71%	26	37%
Climate & Equity	122	176	69%	46	38%
Climate & Health	59	120	49%	22	37%
Climate & Resilience	62	187	33%	29	47%
Chinese	103	160	64%	68	66%
Spanish	25	28	89%	5	20%
Community Workshop #1	23	43	53%	14	61%
Community Workshop #2	12	32	38%	9	75%



SFE-led Pop-ups	64	64	100%	64	100%
Total	1,171	1,643	71%	326	28%
<i>*Number includes viewers from Zoom Meeting (525) and Facebook live (127).</i>					
<i>**No registration available for Facebook Live.</i>					

ONLINE SURVEY SUMMARY

The online survey received 800 responses.

ONLINE OPEN HOUSE SUMMARY

There were 2,837 visitors to online open house who provided a total of 487 comments on the draft Plan materials.

Metric	Value
# of unique visitors	2,837
# of site visits	4,929
Average time spent on page (sec)	183
# of comments	487

SOCIAL MEDIA SUMMARY

Plan-related activity on social media is summarized below.

KPI	Value
# Posts	155
# Impressions	178,725
# Clicks	418
# Reactions (likes)	899
# Shares	157



Overarching Feedback

The following table presents themes from overarching, cross-sectoral feedback. Feedback shaded in grey are top recurring comments emphasized across engagement methods.

Theme	Feedback
City’s role	Participants would like the City’s main roles to be providing 1) incentives and 2) regulation. *
Affordability	Participants frequently worried about strategy implications for affordability and who would incur the costs. They identified the lack of affordable alternatives as a potential barrier to Plan success.
Interagency collaboration & partnerships	Participants requested more interagency collaboration and partnerships with organizations to reduce inefficiencies, create a more unified and consistent approach, and consider potential for scalability across departments and regions.
Cross-sectoral approach	Participants acknowledged the interconnectivity of strategies and sectors and supported a collaborative, cross-sectoral approach.
Transparency & accountability	Participants support action-oriented goals , clear metrics , and straightforward and transparent progress reporting and emissions tracking.
Equity	Participants feel the top two ways the City can be fair and equitable are: 1) funding and support , and 2) establishing shared decision-making and leadership roles with community leaders and organizations. * Participants requested non-digital community outreach in addition to digital.
Community role	Participants wished for more education and outreach to empower communities to implement the Plan. Participants also questioned whether the burden of implementation and the penalization of noncompliance should fall on the communities, as opposed to corporations or the City.
Workforce development	Participants desired support for workforce development within the local, low-income, and BIPOC communities—including working with students to pursue environmental careers and supporting small businesses to build hiring and training capacity. Participants were also interested in offsetting potential job losses by training existing workforces that would be most affected by Plan implementation.
Streamline codes and permitting	Participants cautioned that complicated and time-intensive codes and permitting processes may impede progress toward climate goals.
Strategy analysis	Participants expressed concern that certain strategies or poor implementation may increase GHG emissions and deepen racial and socioeconomic inequities. They asked for more rigorous, transparent, and consistent analyses of strategy effectiveness.



Theme	Feedback
Alignment of existing policies & programs	Participants expressed concerned that the City will use up its resources on the Plan at the expense of ongoing efforts (i.e., current activities would be put on hold).

* Response prompted from survey question.

ONLINE OPEN HOUSE COMMENT SUMMARY

Page Views

The homepage, survey page, and Plan Overview pages were the most visited on the online open house site. The highest-visited sector pages were Transportation & Land Use, Building Operations, and Healthy Ecosystems.

Page	# Views	% of Views
Home	12,285	65%
Survey	2,078	11%
Plan Overview	1,405	7%
Full List Strategies & Actions	952	5%
Summary	393	2%
Transportation & Land Use	314	2%
Building Operations	390	2%
Healthy Ecosystems	343	2%
Energy Supply	236	1%
Responsible Production & Consumption	221	1%
Housing	189	1%
Glossary of Key Terms	43	<1%
Total	18,849	100%



Comments, by Page

The following table summarizes the content and tone of comments received through the online open house, by page, as identified by the Konveio software.

Page	# Comments	# Commentors	% Questions	% Suggestions	% Negative	% Neutral	% Positive
Home	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Survey	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Plan Overview	149	57	20%	80%	28%	67%	11%
Full List Strategies & Actions	116	20	5%	95%	22%	69%	11%
Summary	48	12	25%	58%	29%	62%	16%
Transportation & Land Use	49	22	22%	78%	24%	61%	15%
Building Operations	24	14	27%	73%	26%	65%	9%
Healthy Ecosystems	54	19	12%	88%	18%	66%	16%
Energy Supply	11	7	27%	73%	46%	46%	9%
Responsible Production & Consumption	19	13	27%	73%	27%	73%	0%
Housing	16	8	14%	86%	52%	48%	0%
Glossary of Key Terms	1	1	0%	100%	0%	0%	100%
Total/Average	487	173	18%	80%	27%	56%	19%

Comments, by Topic

Comment distribution—including sector-relevant comments from the “Plan Overview”, “Summary”, and “Full List of Strategies” pages—are presented below.

Building Operations	Energy Supply	Healthy Ecosystems	Housing	Responsible Production & Consumption	Transportation & Land Use	Other
Online Open House - Total Comments						
48	28	159	53	46	112	19



Individual Sector Feedback

This section summarizes public comments received specific to individual Plan sectors. Feedback within each table and table sub headers are presented in ascending order from most common feedback heard to less commonly heard. Feedback shaded in grey, are recurring comments that were most emphasized throughout the methods of engagement. “Konveio” refers to comments posted on the online open house documents.

Notes (applicable to all sector feedback tables below):

“Where Heard” Column key:

WS1-10: Online Workshops 1 through 10

Konveio: Online Open House

Survey: Online Survey

Email: Feedback provided via email

Pop-up: Pop-up presentations

Underserved Communities/Minority Voices: includes feedback from: Equity workshop, Spanish in-language workshop, Chinese in-language workshop, SFUSD BIPOC Climate Justice Council, Japantown Task Force, and Bayview Hunters Point Environmental Justice Taskforce.

Themes with an asterisk (*) represent themes that overlapped among Underserved Communities/Minority Voices and general community feedback.

BUILDING OPERATIONS

THEME	FEEDBACK	RELEVANT STRATEGIES	WHERE HEARD
Areas of Support			
Workforce development	<ul style="list-style-type: none"> Support for developing workforce while meeting clean energy goals. Interest in retraining existing workforce to address concerns that electrifications will lead to job losses. 	BO 3	WS1, WS4, WS6, WS7, Konveio, Email
Building electrification & incentives	<ul style="list-style-type: none"> Support for replacing high-emitting appliances with electric alternatives, provided these alternatives indeed emit less carbon and are affordable. Support for residential electrification incentives/rebates. 	BO 1, BO 2	WS5, WS7, Konveio, Email, Survey
New and existing building developments and retrofits	<ul style="list-style-type: none"> Support for passive house building measures. Support for requiring solar installation on new/existing buildings. 	BO 1; BO 2	Konveio
		BO 1, BO 2	WS7, Konveio



THEME	FEEDBACK	RELEVANT STRATEGIES	WHERE HEARD
	<ul style="list-style-type: none"> Support for City setting an aggressive timeline for buildings to replace/switch to low-impact or natural refrigerants. 	BO 4	Konveio, WS1
Grid resiliency	<ul style="list-style-type: none"> Support for efforts to increase building and electric grid resiliency in the event of natural disasters, power outages, and sea level rise. 	BO 1, BO 2	WS1, WS7, Konveio, Email
GWP refrigerants	<ul style="list-style-type: none"> Support for addressing high-GWP refrigerants. 	BO 4	Email
Areas for Improvement			
Direct homeowner outreach	<ul style="list-style-type: none"> Interest in providing more direct outreach to individual homeowners. 	BO 1, BO 2, BO 4	WS2, WS5, WS6, Konveio
Water resilience	<ul style="list-style-type: none"> Interest in including strategies that focus on water consumption of buildings, especially as it relates to climate resiliency. 	BO 1, BO 2	WS1, WS4, WS7, Konveio
Transparency & tracking	<ul style="list-style-type: none"> Interest in a more accurate analysis of tracking emissions instead of the current WRI market-based. Interest in transparent/updated metrics of energy efficiency available on a website and environmental impact of storage technologies. 	BO 1, BO 2	WS7, Konveio
Banning natural gas in new construction	<ul style="list-style-type: none"> Confusion regarding goals and if “new buildings” include residential, commercial, and mixed-use buildings. 	BO 1	WS2, WS3, Konveio
Building codes and permits	<ul style="list-style-type: none"> Concern that complicated building codes and permitting processes would make it difficult to decarbonize existing and new buildings. Interest in applying permit compliance checking for appliance replacements. Interest in requiring 100% carbon-free power in all new buildings in 2021. 	BO 1, BO 2	Konveio, Email
Energy efficiency in MF/existing	<ul style="list-style-type: none"> Interest in installation energy efficient appliances in multifamily construction and existing buildings. 	BO 1, BO 2	WS4, Survey



THEME	FEEDBACK	RELEVANT STRATEGIES	WHERE HEARD
Contractor list	<ul style="list-style-type: none"> Interest in City suggesting experts and qualified contractors to support transition and to help residents and property owners make plans. 	BO 2	WS1, WS4
Grid resiliency	<ul style="list-style-type: none"> Interest in creating grid relationships beyond the building level (resilient infrastructure at the block/neighborhood scale). 	BO 1, BO 2	WS1
Commercial buildings	<ul style="list-style-type: none"> Concern that Plan does not acknowledge that fuel switching for commercial buildings, when compared to residential buildings, is more complex and would therefore require more time, coordination, and planning. 	ES 1, ES 2	Email
Non-compliance	<ul style="list-style-type: none"> Interest in City including what would happen to those who don't comply with electrification. 	BO 1, BO 2	WS2
Equity			
Cost burden	<ul style="list-style-type: none"> Concern that the immediate cost shifts from buildings switching to electric will burden small businesses, low-income, and middle-income communities and renters. Concern that low-income residents who cannot afford the replacements will be penalized. Interest in a staggered timeline for each neighborhood based on socioeconomic factors. 	BO 1, BO 2	WS2, WS4, WS5, WS10, Konveio, Email
BIPOC Employment	<ul style="list-style-type: none"> Support for prioritizing companies that employ local BIPOC individuals. 	BO 3	Konveio
Specific constituencies	<ul style="list-style-type: none"> Interest in identifying specific constituencies as opposed to simply using the BIPOC acronym to address different and diverse communities. 	All	WS5
Equitable implementation & outcomes	<ul style="list-style-type: none"> Support for oversight, accountability, and transparency of strategies. 	All	WS5



THEME	FEEDBACK	RELEVANT STRATEGIES	WHERE HEARD
Other Considerations			
Increased education and outreach	<ul style="list-style-type: none"> Support for increased public awareness efforts and community outreach to educate homeowners and ease concerns about required changes. 	N/A	WS6, WS4, WS3, WS7
Environmental health	<ul style="list-style-type: none"> Interest in considering health effects from indoor air quality issues. 	All	WS10
Building community support	<ul style="list-style-type: none"> Interest in developing strong messaging tailored to each audience to build community support and political will. 	All	WS10
Underserved Communities/Minority Voices			
Electrification cost incentives & education*	<ul style="list-style-type: none"> Desire for cost incentives and education for low-income and elderly residents to switch to all electric. 	BO-2	WS5, WS8, WS9
	<ul style="list-style-type: none"> Interest in seeing education and promotion of electrification via continued community workshops and other media/social media. 	All	WS8, WS9
Transparency*	<ul style="list-style-type: none"> Emphasized the need for transparency with goal progress (emissions reductions/costs) via a dashboard. 	N/A	WS5, WS8, WS9
State funding*	<ul style="list-style-type: none"> Would like the City to continue working with the State to secure funding for electrification. Worried that progressive cities get less state funding. 	N/A	WS8
Decarbonization	<ul style="list-style-type: none"> Support for decarbonization and moving away from fossil fuels. 	BO-1, BO-2, BO-3	WS8



ENERGY SUPPLY

THEME	FEEDBACK	RELEVANT STRATEGIES	WHERE HEARD
Area of Support			
Microgrids & decentralization	<ul style="list-style-type: none"> Support to move towards microgrids instead of centralized source high voltage grid system and for community-owned distributed energy sources. 	ES 3	WS5, Konveio
Renewable energy	<ul style="list-style-type: none"> Support for more renewable energy sources and more ambitious renewable energy goals. Mixed support for hydropower: some want to increase use and others highlighted unintended consequences on ecosystem health. 	ES 2	WS1, Konveio
Grid structure	<ul style="list-style-type: none"> Support for the use of district energy and steam. 	ES 3	WS2
Carcinogenic fuels	<ul style="list-style-type: none"> Support for stopping wood and biofuel burning and reducing use of carcinogenic fuels. 	ES 2	Konveio
Areas for Improvement			
Workforce development	<ul style="list-style-type: none"> Interest in the city helping to increase workforce development and training efforts. 	ES 4	WS1, WS2, WS4, WS5, WS10, WS11, Survey
Education	<ul style="list-style-type: none"> Interest in proactive, culturally responsive, and widespread education to communicate energy goals and benefits to communities. 	N/A	WS3, WS4, WS7, Konveio
Incentives	<ul style="list-style-type: none"> Interest in the City providing incentives or funds to small businesses and NGOs for switching to electric and energy efficient appliances. Interest in income-based clean energy subsidies and incentives. 	ES 2	WS4, WS7



THEME	FEEDBACK	RELEVANT STRATEGIES	WHERE HEARD
Transparency	<ul style="list-style-type: none"> Interest in transparent communication about goals, implementation, challenges, timeline, etc. with residents by distributing information and engaging the community. 	All	WS10, WS11
	<ul style="list-style-type: none"> Interest in making the Plan’s GHG emissions accounting more comprehensive, consistent, and audited by a third party. 	ES 1	Email
Renewable energy	<ul style="list-style-type: none"> Some interest in placing wind turbines throughout the city. 	ES 2	WS8, Konveio
Density	<ul style="list-style-type: none"> Concern that density is incompatible with on-site energy independence via solar. 	ES 2	Konveio
Other benefits	<ul style="list-style-type: none"> Interest in policies for clean power sources that may not help lower GHG emissions but provide many other benefits. 	ES-1	Email
Equity			
Cost burden	<ul style="list-style-type: none"> Interest in the City implementing a bond to fund solar power at affordable housing. Concern that it is harder for low-income communities to access renewable energy. 	ES 2	WS4, WS7, Konveio
Green gentrification	<ul style="list-style-type: none"> Concern that any efforts for an equitable transition away from the City’s natural gas system will worsen gentrification by making the area more desirable (green gentrification), therefore augmenting the housing shortage. 	ES 5	Konveio
Other Considerations			
Multiple actors	<ul style="list-style-type: none"> Interest in clarity and use of multiple levers, including public/private partnerships, philanthropy, NGOs, and unions. 	N/A	WS1, WS11



THEME	FEEDBACK	RELEVANT STRATEGIES	WHERE HEARD
External energy sources	<ul style="list-style-type: none"> Confusion as to whether San Francisco will use energy generated outside city borders and work with the state to ensure GHG-free electricity. 	ES 1	WS2, WS7
Timeline	<ul style="list-style-type: none"> Question about the timeline for implementation. 	All	WS10
Connections to health	<ul style="list-style-type: none"> Interest in discussing and considering the intersection of health and energy supply. 	N/A	WS10
Underserved Communities/Minority Voices			
Cost burden*	<ul style="list-style-type: none"> Would like the City to assist with increased utility cost to low-income, elderly, and non-profits. 	ES 1, ES 2, ES 3	WS5, WS8, WS9, pop-up
In-language outreach and education	<ul style="list-style-type: none"> Request for in-language outreach and education 	ES 1, ES 2, ES 3	WS8, WS9
Safety	<ul style="list-style-type: none"> Existing building power capacity may not be able to handle a transition to all electric appliances which may cause short-circuiting. This may be dangerous for residents, especially the elderly. 	ES 2, ES 3, ES 5	WS5, WS9
Cultural relevance	<ul style="list-style-type: none"> Concern that the transition to energy efficient appliances is not culturally relevant (electric stove) and may harm business owners. 	N/A	WS8, WS9
Workforce development*	<ul style="list-style-type: none"> Interest in workforce development through City College. 	ES 4	WS5



HEALTHY ECOSYSTEMS

THEME	FEEDBACK	RELEVANT STRATEGIES	WHERE HEARD
Areas of Support			
Native plants	<ul style="list-style-type: none"> Support for expansion of native ecosystems and limitation of invasive species and use of pesticides. Emphasis on planting native wetland plants/grasses, and low-lying fauna instead of trees. 	HE 8	WS2, WS3, WS4, WS6, WS7, Konveio, Survey
Urban greening/ forestry	<ul style="list-style-type: none"> Support for planting street trees, native trees, and preserving existing mature trees. 	HE 5	Survey
	<ul style="list-style-type: none"> Support for increased funding for urban forestry/ecosystem stewardship programs. Support for creating wildlife corridors around the city and converting concrete/AstroTurf to planters and green spaces especially in underutilized areas. 	HE 5, HE 6	WS3, Konveio, Survey
Areas for Improvement			
Community involvement and education	<ul style="list-style-type: none"> Interest in funding community participation and providing financial incentives to businesses and residents to encourage living architecture and native plants in gardens and nurseries. Interest in active communication between community and the city during greening projects. Interest in partnering with schools and other organizations like architecture firms for stewardship work. Interest in education opportunities on the importance of green areas. 	HE 2	WS1, WS5, WS6, WS7, WS11, Konveio, Email
	<ul style="list-style-type: none"> Interest in integrating a citizen science component by expanding data inputs and public awareness of urban habitat. 	HE 1, HE 2, HE 7	Email
Other ecosystems	<ul style="list-style-type: none"> Interest in including wetlands, perennial grasslands, and oceans in the strategies. 	N/A	WS5, Konveio
Stewardship jobs	<ul style="list-style-type: none"> Interest in the City allocating funding and creating ecosystem stewardship and gardening positions. 	HE 2	WS4, Konveio, Email



THEME	FEEDBACK	RELEVANT STRATEGIES	WHERE HEARD
Safe environment	<ul style="list-style-type: none"> • Interest in conducting thorough testing, clean-ups, and remediation of all radioactive and hazardous waste contamination along and near waterfront areas. • Interest in addressing the issue of rising sea levels and groundwater threatening to flood radioactive and hazardous waste contamination sites in vulnerable and at-risk communities. 	N/A	Email, Survey
Resilience	<ul style="list-style-type: none"> • Interest in creating resilient ecosystems in the face of natural disasters and sea level rise. 	All	WS10, WS11
Protect and expand green space	<ul style="list-style-type: none"> • Interest in limiting population in the city and support for monitoring ecological management progress. • Interest in protecting existing habitats from development. • Interest in limiting outdoor lighting and controlling runoff. 	HE 5, HE 6, HE 7, HE 8	Konveio
Agriculture on rooftops and backyards	<ul style="list-style-type: none"> • Interest in having land use policy also support local, small scale agriculture on rooftops and in backyards. 	HE 8	Konveio
Equity			
Restoration efforts	<ul style="list-style-type: none"> • Interest in empowering local communities, specifically native voices, to access green spaces and engaging them in land stewardship efforts and the City’s decision making. • Interest in focusing urban greening efforts on underserved areas while limiting gentrification (e.g. finding balance between green spaces/affordable housing development). • Interest in linking racial and social equity to health and green spaces. 	HE 2	WS4, WS5, WS6, WS10, Konveio



THEME	FEEDBACK	RELEVANT STRATEGIES	WHERE HEARD
Job creation	<ul style="list-style-type: none"> Support for creating career pipelines for environment jobs by hiring within communities and ensuring every org has a DEI framework to address institutional inequities. 	HE 2	WS2, WS4, WS5, Konveio
Community involvement	<ul style="list-style-type: none"> Interest in engaging and following leadership from frontline and historically underserved communities. Interest in City partnerships with local BIPOC organizations or low-income communities. 	All	WS5, Email
Funding	<ul style="list-style-type: none"> Support for redistribution/increase of funding to historically ignored areas to maintain healthy ecosystems 	HE 4	Konveio
Space limitation	<ul style="list-style-type: none"> Concern that some neighborhoods have more room for parks and open space than others. Thus, more urbanized neighborhoods will not have opportunities for added green spaces. 	HE7, HE8	WS11
Explicitness	<ul style="list-style-type: none"> Interest in calling out equity explicitly in the strategies. 	All	WS5
Other Considerations			
Alignment of goals	<ul style="list-style-type: none"> Interest in aligning goals (especially housing goals) of City agencies and regulating industries (e.g., transportation, landscaping, construction). Interest in mandating cross-agency collaboration and strengthening and advancing City departments' existing policies, such as San Francisco's Biodiversity Resolution. 	HE 1, HE 2	WS2, WS3, WS5, Email
Density	<ul style="list-style-type: none"> Interest in getting rid of the Shadow Ordinance and building up, not out. 	N/A	Konveio
Terms	<ul style="list-style-type: none"> Confusion about what "built environment" means. 	HE 4	WS11



THEME	FEEDBACK	RELEVANT STRATEGIES	WHERE HEARD
Environmental health	<ul style="list-style-type: none"> Interest in addressing pollution-related public health emergencies in already-impacted Bayview Hunters Point and Treasure Island. 	N/A	Email
Underserved Communities/Minority Voices			
Cost burden & incentives	<ul style="list-style-type: none"> Although eager to reduce emissions and make changes, hesitant of the accompanying costs to residents. Would like the City to provide financial support and incentives. 	HE 4	WS5, WS8
Education to elderly	<ul style="list-style-type: none"> Interest in seeing an outreach and education plan that reaches the elderly populations. 	HE 3	WS8, WS9
Unique community barriers	<ul style="list-style-type: none"> Interest in seeing tailored greening and restoration plans for different communities with unique barriers. 	All	WS9
Clean streets	<ul style="list-style-type: none"> Interest in seeing the City take action on cleaning and maintenance of existing streets and parks. 	N/A	WS9
Conflict with housing need	<ul style="list-style-type: none"> Concern about space conflicts with the need for new housing. 	HE 7	WS 5



HOUSING

THEME	FEEDBACK	RELEVANT STRATEGIES	WHERE HEARD
Areas of Support			
Housing development	<ul style="list-style-type: none"> Support for new housing, especially infill development. 	Sector goal	Survey
Process streamlining	<ul style="list-style-type: none"> Support for streamlining the planning and building process. 	H 3	Konveio
Underutilized buildings	<ul style="list-style-type: none"> Support for redeveloping and renovating underutilized buildings to contribute to housing goals. 	H2, H 3	WS6
Expanding tenant services	<ul style="list-style-type: none"> Support for financially supporting affordable housing for BIPOC communities by expanding tenant services. 	H1	Konveio
Areas for Improvement			
Affordability	<ul style="list-style-type: none"> Concern that affordable housing may not be cost-effective for developers. Interest in: <ul style="list-style-type: none"> Granting surplus City-owned land at no cost to non-profit developers to build affordable housing and maximize the density. Developing more affordable units lower in new buildings and in less desirable harder to rent/sell facings. Providing a density bonus to effectively reduce the land cost per unit or to offer direct affordable housing grants to developers. Interest in the City requiring a certain number of affordable units to be built and leased before allowing any new market rate housing. Interest in replacing rent control with a rent subsidy based on each tenant's tax returns. 	H 3, H 4	WS5, WS6, WS11, Konveio
Green and resilient housing	<ul style="list-style-type: none"> Interest in the City setting requirements for sustainable water systems in all new housing. Interest in planning for resilient housing prior to construction as opposed to afterwards. 	H 1, H 2, H 3, H 4	WS1, WS2, WS3, WS4, WS11, Konveio



THEME	FEEDBACK	RELEVANT STRATEGIES	WHERE HEARD
Goals and targets	<ul style="list-style-type: none"> Mixed feelings about the feasibility of the sector goal. Some think the sector goal is too low, while others think the sector goal is unrealistic. With the housing shortage and growing industry, more units are needed to increase housing affordability, especially for BIPOC residents. 	N/A	WS2, WS3
	<ul style="list-style-type: none"> Interest in aligning Strategy 3 with Transportation and Land Use: expanding transit access and options and making sure housing density aligns with access to transit, businesses, and services, especially schools. 	H 3	Konveio
Community	<ul style="list-style-type: none"> Interest in adding support of site-based community building. 	H 1	Email
Affordable housing green space	<ul style="list-style-type: none"> Interest in seeing green space access requirements for affordable housing. 	N/A	WS6
Partnerships	<ul style="list-style-type: none"> Interest in City forming formal connections between non-profits, trade groups, and other organizations. 	H 3	WS1
Equity			
Affordability	<ul style="list-style-type: none"> Interest in distributing affordable housing through all neighborhoods unless BIPOC communities requested housing in cultural districts. Interest in developing affordable housing near goods and services. Interest in solutions that build housing affordability, as opposed to affordable housing. Interest in making explicit the housing burden by race and outlining the historic inequities that mean current BIPOC communities are overburdened with housing costs. 	H 1, H 3, H 4	WS1, WS2, WS5, WS7, WS10, Konveio, Survey
Gentrification	<ul style="list-style-type: none"> Interest in supporting small businesses and protecting the area from gentrification. Interest in protecting current communities from displacement. 	H 1	WS5, WS6, WS11



THEME	FEEDBACK	RELEVANT STRATEGIES	WHERE HEARD
Combating multi-generational poverty	<ul style="list-style-type: none"> Interest in introducing and growing new land and building ownership models that cultivate community and begin to grow wealth in communities with multi-generational poverty. 	H 4	Email
Other Considerations			
Resistance	<ul style="list-style-type: none"> Concern about resistance to building affordable housing sites, larger buildings, and shelters for unhoused people. 	H 2	WS2, WS3, WS10, WS11
Inclusion of the middle class	<ul style="list-style-type: none"> Mixed interests in who to focus on in these strategies. Some believe that strategies need to include the lower middle class as well, while others believe that all the resources that go to the middle class are further overburdening lower-income BIPOC communities. 	H 1, H 2, H 4	WS7, WS11, Konveio
Terms	<ul style="list-style-type: none"> Confusion about what “affordable” means in the context of the 30% affordable housing goal. 	N/A	WS6, WS7
Scale	<ul style="list-style-type: none"> Concern that housing issues are regional and some affected by SF’s housing policies live outside of the city. 	N/A	WS5
Housing quality	<ul style="list-style-type: none"> Interest in the City discussing the quality of new housing. 	H 1, H 2	WS10
Underserved Communities/Minority Voices			
Small property owners	<ul style="list-style-type: none"> Support for actions that encourage small property owners to add housing and rehabilitate existing units but interested in accompanying policies that protect small property owners from non-compliant, non-paying renters. 	H 1, H 2, H 3, H 4	WS8, WS9, Pop-up
Revised zoning and permitting	<ul style="list-style-type: none"> Support for updating zoning and allowing live-work spaces. Interested in policies/permits that allow building up versus building out. Support for affordable housing in all neighborhoods, including low-density neighborhoods. 	H 3	WS8, WS9,



THEME	FEEDBACK	RELEVANT STRATEGIES	WHERE HEARD
Sector goals*	<ul style="list-style-type: none"> • Would like clarity on how to 5,000 new housing units per year metric was developed. Interest in a more aggressive timeline for new housing. • 30% affordable housing goal seems low 	N/A	WS5, Pop-up
Transparency*	<ul style="list-style-type: none"> • Need for easy to understand, real time tracking towards Plan goals and resulting benefits to specific communities/demographics. 	N/A	WS8, WS9
Affordable housing*	<ul style="list-style-type: none"> • Support for increased funding and development of affordable housing. 	H 4	Pop-up
	<ul style="list-style-type: none"> • Interest in a more aggressive timeline and goal for affordable housing. Would also like to speed up the process for residents to obtain affordable housing. 	H 1, H 2, H 4	WS8
Multilingual education	<ul style="list-style-type: none"> • Interest in multilingual education and outreach regarding next steps to achieve plan goals and responsibility/resources for residents. • Interest in continued coordination via community workshops 	All	WS8
Unhoused	<ul style="list-style-type: none"> • Would like the Plan to detail actions to assist the unhoused through mental health programs and job training on top of financial assistance. 	H 2	WS8



RESPONSIBLE PRODUCTION & CONSUMPTION

THEME	FEEDBACK	RELEVANT STRATEGIES	WHERE HEARD
Areas of Support			
Waste reduction	<ul style="list-style-type: none"> Support for prioritizing waste reduction (e.g., food waste and packaging). 	RPC 2, RPC 3	WS1, WS4
Producer responsibility	<ul style="list-style-type: none"> Support for extending producer responsibility policies. 	RPC 3	WS2, Konveio
Embodied carbon	<ul style="list-style-type: none"> Support for reduction of embodied carbon in buildings and infrastructure. 	RPC 1	WS1, WS2, Konveio
Food and plant-based diets	<ul style="list-style-type: none"> Support for promoting and subsidizing plant-based diets, especially by providing incentives for plant-based restaurant meals and committing to plant-based foods in City buildings. 	RPC 2	WS5, Konveio
Consumption	<ul style="list-style-type: none"> Support for considering consumption-based emissions. 	RPC 3	Konveio
Areas for Improvement			
Reuse of goods and services	<ul style="list-style-type: none"> Interest in encouraging and capturing the decarbonization impacts of reuse and secondhand markets. This could include community repair events, lists of repair businesses, and donation avenues, and a requirement for Recology to ensure reuse of durable items and materials. Interest in limiting virgin plastic items and single-use items and closing loopholes in the current plastic bag ban. Interest in seeing textiles and clothing products mentioned in the measures. Interest in banning or taxing unsustainable materials. 	RPC 3	WS1, WS4, WS7, Konveio, Survey



THEME	FEEDBACK	RELEVANT STRATEGIES	WHERE HEARD
Waste reduction, recycling, and compost	<ul style="list-style-type: none"> Interest in pressuring companies to reduce packaging or incorporate environmentally friendly packaging options. Interest in re-introducing materials drop-off locations in the city. Interest in providing biogas digesters and compostable bags in parks to divert dog waste. Interest in getting SF access to anaerobic digester at Recology. 	RPC 3	WS4, WS10, WS11, Konveio
Education & outreach	<ul style="list-style-type: none"> Interest in educating community, particularly students, about the link between soil health, foods, and human health. Interest in engaging communities to buy local and sustainable products, if they need to buy at all. 	RPC 5	WS3, WS6, WS6, WS11, Konveio
Building materials	<ul style="list-style-type: none"> Interest in reusing construction and demolition materials. Interest in limiting cement use in San Francisco. Interest in using a lighter colored alternative to the cement/asphalt currently used in some city sidewalks. Interest in seeking out architects using decarbonizing building practices such as mass timber. Interest in considering fence material made from plastic detergent jugs. Interest in mentioning steel in the measures. 	RPC 1	WS4, Konveio, Survey
Workforce development	<ul style="list-style-type: none"> Interest in retraining and retaining blue collar employees who get displaced. 	N/A	WS10, WS11
	<ul style="list-style-type: none"> Interest in local recycling and local green jobs. 	N/A	WS4
Food and plant-based diets	<ul style="list-style-type: none"> Interest in the promotion of regenerative agriculture products as part of a Food Waste Prevention and Edible Food Recovery Policy. 	RPC 2	WS7, Konveio



THEME	FEEDBACK	RELEVANT STRATEGIES	WHERE HEARD
Consumption emissions	<ul style="list-style-type: none"> Interest in seeing a specific goal around consumption emissions that includes the production and transportation of the goods and other stages of the life cycle. 	RPC 3	WS7, Konveio
Reporting requirements	<ul style="list-style-type: none"> Interest in requiring Environmental Product Declarations (EPDs) that identify total embodied carbon of different categories of products. 	N/A	WS1
Other modes	<ul style="list-style-type: none"> Interest in including plans to curb aviation and maritime emissions. 	RPC 4	WS1
Community	<ul style="list-style-type: none"> Support facilitating the creation of inclusive and networked neighborhood scale projects. 	RPC 3-3	Email
Equity			
Impact on businesses	<ul style="list-style-type: none"> Concern that the goal will disproportionately impact BIPOC-, locally-owned, or small businesses. 	N/A	WS6, WS11
Access to food	<ul style="list-style-type: none"> Interest in providing access to fresh produce in certain districts that previously did not have access. Interest in making sure that donation centers stay culturally relevant to recipients. 	RPC 2	WS6
Other Considerations			
COVID	<ul style="list-style-type: none"> Interest in addressing impacts of COVID-19 on responsible production and consumption. 	N/A	WS1, WS6, WS7
Community gardens	<ul style="list-style-type: none"> Question about where community gardens fit in this goal. Interest in encouraging landlords to optimize unused space such as a community garden. 	N/A	WS10, Konveio
Corporate responsibility and enforcement	<ul style="list-style-type: none"> Interest in focusing efforts to ensure responsible consumption and production on corporations, not on consumers. 	RPC 3	Konveio
	<ul style="list-style-type: none"> Concern of how the City will hold companies accountable for lifecycle emissions and new standards for materials. 	N/A	WS2



THEME	FEEDBACK	RELEVANT STRATEGIES	WHERE HEARD
Other materials	<ul style="list-style-type: none"> Interest in including e-waste. 	RPC 3	WS2
Legal authority	<ul style="list-style-type: none"> Concern about how the City will enforce waste and food systems outside of the city. 	N/A	WS3
Underserved Communities/Minority Voices			
Restrictions for producers*	<ul style="list-style-type: none"> Interest in seeing City or state set limitations for production (permitting for production and penalties for overproduction). Interest in City and state increasing sustainability standards for producers. 	RPC1, RPC 2, RPC 3, RPC 4	W5, W8, W9
Clear education and resources*	<ul style="list-style-type: none"> Interest in clear/simple communication, education, and resources for residences. Interest in educating children about RPC practices and provide funding to teach in schools. 	RPC 5	W5, W8, W9
Support for small businesses*	<ul style="list-style-type: none"> Interest in the City providing financial support for restaurants and other small businesses to encourage RPC practices. 	RPC 3	W5, W9
COVID*	<ul style="list-style-type: none"> Do these strategies and actions take into account COVID-19 or any type of other pandemic/emergency response in the future? 	N/A	W8

TRANSPORTATION & LAND USE

THEME	FEEDBACK	RELEVANT STRATEGIES	WHERE HEARD
Areas of Support			
Public transit	<ul style="list-style-type: none"> Support for improving MUNI (safety, reliability, speed, service area). Support for setting goals around transit speed and reliability. 	TLU 1	WS5, WS7, WS10, WS11, Konveio, Email, Survey
Transit-oriented development	<ul style="list-style-type: none"> Support for transit-oriented development. Support for a streamlined approval process for housing near transit. 	TLU 5	WS4, WS6, Konveio, Email, Survey



THEME	FEEDBACK	RELEVANT STRATEGIES	WHERE HEARD
Reducing VMT	<ul style="list-style-type: none"> Support for reducing VMT by increasing the cost of parking and using parking resources more efficiently. 	TLU 4	WS1, WS2, WS3, WS10, Konveio
Bicycling	<ul style="list-style-type: none"> Support for the City defending bicycling just as much as pedestrians or cars. Start shifting from “streets for cars”, to “streets for people.” Support for adding more protected bike lanes. Support for making electric bikes more affordable. 	TLU 2	WS1, WS2, WS7, Konveio
Density and Diversity	<ul style="list-style-type: none"> Support for increasing density, diversity of land uses, and location efficiency across San Francisco. 	TLU 6	WS 6, Survey
Parking	<ul style="list-style-type: none"> Support for parking permits. 	TLU 4	Email
Pricing tools	<ul style="list-style-type: none"> Support for equitable pricing tools. 	TLU 3	Email
Areas for Improvement			
Transit-oriented development	<ul style="list-style-type: none"> Interest in developing housing along bike corridors in addition to near public transit. Interest in investing the additional revenue from upzoning the corridors into community benefits. 	TLU 6	WS2, WS4, WS5, WS6, WS7, Konveio, Email
Bike access and safety	<ul style="list-style-type: none"> Interest in more communal storage/bike racks in garages and ways to discourage bike theft. Interest in bikeshares. Interest in enforcing bicyclists to adhere to the laws. Interest in making installing bike racks easier (not requiring months of community hearings). 	TLU 2	WS2, WS10, Konveio
Transit	<ul style="list-style-type: none"> Support for making public transit free for all riders. Support for free transit passes for residents. 	TLU 1	WS7, Konveio
	<ul style="list-style-type: none"> Interest in developing apps that track public transit options to make them more reliable. 	TLU 1	WS11
	<ul style="list-style-type: none"> Interest in requesting more frequent cleaning of buses and trains so they are more pleasant to ride. Interest in considering giving all buses priority at intersections, raising MUNI trains on a platform, and/or adding more bus-only lanes. 	TLU 1	Konveio



THEME	FEEDBACK	RELEVANT STRATEGIES	WHERE HEARD
	<ul style="list-style-type: none"> Interest in eliminating low-use MUNI routes and subsidizing ride-share fares for needy riders. 	N/A	Konveio
	<ul style="list-style-type: none"> Interest in focusing on all city stations and off-peak hours, as opposed to focusing most services and funding on the peak hours downtown. 	TLU 3	Email
Reducing VMT	<ul style="list-style-type: none"> Concern that EVs are not a sustainable solution to cars. Car tires are polluting, and cars take up parking and road space and mainly benefit wealthy people. Interest in installation of EV chargers in multifamily construction and existing buildings. Interest in phasing out conventional commercial and delivery vehicles, cabs, and ride-hailing vehicles. Interest in the City leading by example and making all City-owned vehicles/bikes electric (if not already). 	TLU 7	WS4, Konveio
Pricing tools	<ul style="list-style-type: none"> Interest in additional pricing tools to capture the full range of climate externalities associated with driving private cars and advancing equity. 	TLU 3	Email
Household transportation audit	<ul style="list-style-type: none"> Interest in the City offering a transportation audit per household to identify transportation needs and make recommendations for shifts to align with Plan goals. 	TLU 2	Konveio
Equity			
Zoning	<ul style="list-style-type: none"> Interest in up-zoning parts of the city that were founded as Whites-only communities. Interest in expanding multifamily zoning to all neighborhoods, not just in transit corridors to combat environmental injustice. Concern that a NIMBY neighborhood will resist sustainable transit options and transit-oriented development. 	TLU 6	WS2, WS4, WS5, WS6, WS7, WS10, Konveio



THEME	FEEDBACK	RELEVANT STRATEGIES	WHERE HEARD
Cost burden	<ul style="list-style-type: none"> Concern that electric charging is not accessible and expensive. Concern that restricting e-bike subsidies to low-income people will not be as effective because wealthier people are doing most of the driving. 	TLU 2	WS1, WS5, WS10, Konveio
	<ul style="list-style-type: none"> Concern that simply increasing the cost of car ownership without providing easy-to-use alternatives will further punish communities of color. 	TLU 4	Email
Other considerations			
Pandemic	<ul style="list-style-type: none"> Concern that pandemic has moved the City and the residents in the wrong direction. 	TLU 1, TLU 2	WS1, WS2, WS5, WS7, Konveio
Commuters	<ul style="list-style-type: none"> Concern that many commuters and other drivers come from outside of the city and county. Therefore, local policies won't be as effective. Need for coordination on a regional scale. 	TLU 3, TLU 7	WS3, Survey
City "charm"	<ul style="list-style-type: none"> Concern of finding the balance of upzoning and keeping the charm and history of the city (e.g., old Victorian homes) that draw residents and tourists. 	TLU 6	Konveio
CEQA	<ul style="list-style-type: none"> Interest in removing the appeal process in CEQA which slows down transit oriented or affordable housing development. 	N/A	Konveio, Survey
Transit First policy	<ul style="list-style-type: none"> Concern that city is not living up to its Transit First policy. 	TLU 1	Email, Survey
Underserved Communities/Minority Voices			
Convenience	<ul style="list-style-type: none"> Support for expanding the public transportation network, more direct routes for longer distances, and creating more regional connections. 	TLU 1	WS5, WS8, WS9
Safety	<ul style="list-style-type: none"> Interest in increasing safety and security on public transit. 	TLU 1, TLU 2	WS5, WS8, WS9



THEME	FEEDBACK	RELEVANT STRATEGIES	WHERE HEARD
Education and perception	<ul style="list-style-type: none"> • Interest in City campaigns or programs catered to different communities to spur behavior change around public transit. 	TLU 1, TLU 2, TLU 3, TLU4, TLU 5, TLU 7	WS5, WS8, WS9
Reliability*	<ul style="list-style-type: none"> • Interest in a one-stop-shop for real-time transit and traffic updates - that is simple and user friendly for all populations. • Interest in timing of public transit being more reliable. • Suggestion for routine route audits to adjust frequency according to demand. 	TLU1, TLU 2	WS8, WS9
Increased density	<ul style="list-style-type: none"> • Concern that encouraging high density development will negatively impact housing costs, health conditions, and displacement. 	TLU5	WS5



Survey Responses

This section summarizes responses from the online open house survey.

HOW DID YOU HEAR ABOUT THIS OPEN HOUSE?

Respondents learned about the open house through a range of communication channels, but most survey respondents heard through community organizations.

Communication Method	# Responses	% Responses
SF Environment website	112	13%
Social Media	110	13%
Flyer	11	1%
A friend of colleague	121	14%
Community organization	320	37%
Other (please specify)	200	23%
Total	874	

Top “Other” responses included:

- An email from CleanPowerSF (37 responses)
- SF Public Library email, newsletter, or bulletin (36 responses)
- Other/unidentified email (24 responses)
- Email from Friends of the Urban Forest (23 responses)

WHAT TOP THREE STRATEGIES DO YOU THINK THE PLAN SHOULD FOCUS ON?

The top-voted strategies were:

1. Store more **carbon in our plants, trees, and soils** (462 votes)
2. **Transit, walking and biking** over driving (388 votes)
3. Increase **renewable energy** and **energy storage** (341 votes)
4. Shift buildings to **non-fossil fuel sources** (230 votes)

Strategies	# Responses	% Responses
Store more carbon in our plants, trees, and soils	462	20%
Transit, walking and biking over driving	388	17%
Increase renewable energy and energy storage	341	15%
Shift buildings to non-fossil fuel sources	230	10%
Shift to electric or lower-carbon vehicle fuels	226	10%
Reduce the use of single-use materials	216	9%
Affordable housing and housing security	198	9%
Increase number and type of green jobs	175	8%
Consume fewer/different goods and services	82	4%
Total	2318	



HOW WELL DO THE STRATEGIES/ACTIONS DO THE FOLLOWING? RATE FROM 1-5.

- Respondents overall rated the strategies as **doing the best job** at **motivating and inspiring** you to take action to reduce climate pollution and **providing direction to local government** on actions to take to reduce climate pollution.
- Respondents gave the **lowest rating** to the strategies' ability to **provide guidance on actions each of us can take** in San Francisco to reduce climate pollution.
- Respondents gave the most **"unknown"** ratings to the ability of the strategies to **benefit communities that experience higher environmental burden**.

Strategies and Actions	1 (Not at all)	2	3	4	5 (very well)	Unknown	
Provide direction to local government on actions to take to reduce climate pollution.		28	56	201	192	87	236
Provide guidance on actions each of us can take in San Francisco to reduce climate pollution in our own neighborhoods.		37	139	187	148	90	199
Motivate and inspire you to take action to reduce climate pollution.		47	98	174	186	101	194
Benefit communities that experience higher environmental burden.		39	106	174	141	86	254
Total		151	399	736	667	364	883

WHICH ROLE(S) SHOULD THE CITY TAKE TO HELP MEET THE GOALS OF THE CLIMATE ACTION PLAN? PLEASE SELECT YOUR TOP TWO CHOICES.

Role	Total responses	% Total responses
Visioning	197	24%
Leadership	231	28%
Engagement	274	33%
Incentives	482	58%
Regulation	374	45%
Total	835	

WHAT ROLE SHOULD SAN FRANCISCO RESIDENTS AND BUSINESSES TAKE? PLEASE SELECT YOUR TOP CHOICE.

Role	Total responses	% Total responses
Leader	84	11%
Collaborator	541	68%
Follower	118	15%
Uninvolved	8	1%
I'm not sure/need more information to decide	49	6%
Total	800	



HOW CAN THE CITY BE FAIR/EQUITABLE?

Approach	# Responses	% Responses
Shared decision-making	265	20%
Funding and support	296	22%
Engage/collaborate with leaders	207	15%
Translate resources	86	6%
Design policies/programs with incentives	246	18%
Data gathering and tracking	73	5%
Evaluate and report on impact	145	11%
Other	39	3%
Total	1357	

DO YOU HAVE ANY OTHER COMMENTS, CONCERNS, OR QUESTIONS ABOUT THE SAN FRANCISCO CLIMATE ACTION PLAN UPDATE?

(See Supporting Document A for detailed responses)

Themes from the open-ended responses:

- Trees, tree, plant, planting, native (315 mentions)
- Climate, change, emissions, carbon (226 mentions)
- Public, people, residents, community, neighborhoods (194 mentions)
- Transit, streets, cars, transportation, vehicles (87 mentions)
- Funding, money, cost, incentives (67 mentions)
- Housing, housed (47 mentions)
- Health (29 mentions)

APPENDIX B-2: CAP Community Engagement feedback - City comment resolution form

Energy Supply	ES 2	Improvement	Incentives	Interest in income-based clean energy subsidies and incentives.	B - No revision recommended	City-sponsored clean energy programs, such as community solar and GoSolarSF, have income eligibility requirements already. This concept will continue to be centered in our work around incentivizing clean energy. Please see ES 1-4, ES 2-4, and ES 2-5 for more information.	N/A - not applicable	WS4, WS7
Energy Supply	All	Improvement	Transparency	Interest in transparent communication about goals, implementation, challenges, timeline, etc. with residents by distributing information and engaging the community.	B - No revision recommended	By 2022, the SFPUC will be adopting equitable engagement guidelines to improve our engagement with the community. The SFPUC also hosts quarterly community outreach meetings about its power programs. Sandy to ask SFE to add in some language around overall CAP communication.	N/A - not applicable	WS10, WS11
Energy Supply	ES 1	Improvement	Transparency	Interest in making the Plan's GHG emissions accounting more comprehensive, consistent, and audited by a third party.	C - Applicable to future implementation or other resource (eg. Different Plan)	Details regarding the GHG emissions associated with energy supply can be found in utility "product content labels" that are prepared in the manner prescribed by State law and regulations. Please check out the product content labels for the three main utility providers in San Francisco (CleanPowerSF, Hetch Hetchy Power, PG&E) for more detail. San Francisco's greenhouse gas emission inventory follows Global Protocol for Cities and guidance from ICLEI, as well as California law and regulations.	N/A - not applicable	Email
Energy Supply	ES 2	Improvement	Renewable energy	Some interest in placing wind turbines throughout the city.	B - No revision recommended	The City continues to support the development of local renewable energy, including wind, where feasible and cost-effective.	N/A - not applicable	WS8, Konveio
Energy Supply	ES 2	Improvement	Density	Concern that density is incompatible with on-site energy independence via solar.	B - No revision recommended	Density of housing is a factor for full on-site energy independence, but it is compatible with development of onsite solar, as building and garage roofs are often great places for solar. The City supports onsite solar where it is feasible and cost-effective, and supports energy efficiency as an important resource in promoting greater energy independence.	N/A - not applicable	Konveio
Energy Supply	ES-1	Improvement	Other benefits	Interest in policies for clean power sources that may not help lower GHG emissions but provide many other benefits.	B - No revision recommended	It's incredibly important that we ensure our energy policies prioritize communities and offer co-benefits. However, it's not clear what clean energy work would benefit communities but not lower GHG emissions.	N/A - not applicable	Email
Energy Supply	ES 2	Equity	Cost burden	Interest in the City implementing a bond to fund solar power at affordable housing.	B - No revision recommended	The City continues to support the development of onsite solar at affordable housing (ES 2-1). The City systematically optimizes appropriate financing options, such as bonds, in order to meet program priorities.	N/A - not applicable	WS4, WS7, Konveio
Energy Supply	ES 2	Equity	Cost burden	Concern that it is harder for low-income communities to access renewable energy.	B - No revision recommended	The City is working to ensure low-income communities can access the benefits of renewable energy by ensuring rates for renewable energy are affordable and accessible for low-income residents (ES 1-4), our affordable housing developments can access onsite solar and storage (ES 2-1), and our programs are designed to support our low-income communities (ES 2-5).	N/A - not applicable	WS4, WS7, Konveio
Energy Supply	ES 5	Equity	Green gentrification	Concern that any efforts for an equitable transition away from the City's natural gas system will worsen gentrification by making the area more desirable (green gentrification), therefore augmenting the housing shortage.	B - No revision recommended	A recurring point in stakeholder outreach was that low-income communities and communities of color are hurt first, and worst - including by health impacts of exposure to indoor and outdoor pollution from natural gas combustion. See Building Operations Strategies BO2, BO3, and BO4, which address equitable distribution of incentives, technical support, and workforce development resources as well as propose new/upgraded anti-displacement policies.	N/A - not applicable	Konveio

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Energy Supply	N/A	Other Considerations	Multiple actors	Interest in clarity and use of multiple levers, including public/private partnerships, philanthropy, NGOs, and unions.	B - No revision recommended	N/A - not applicable	WS1, WS11
Energy Supply	ES 1	Other Considerations	External energy sources	Confusion as to whether San Francisco will use energy generated outside city borders and work with the state to ensure GHG-free electricity.	B - No revision recommended	N/A - not applicable	WS2, WS7
Energy Supply	All	Other Considerations	Timeline	Question about the timeline for implementation.	B - No revision recommended	N/A - not applicable	WS10
Energy Supply	N/A	Other Considerations	Connections to health	Interest in discussing and considering the intersection of health and energy supply.	B - No revision recommended	N/A - not applicable	WS10
Energy Supply	ES 1, ES 2, ES 3	Underserved Communities/Minority Voices	Cost burden*	Would like the City to assist with increased utility cost to low-income, elderly, and non-profits.	B - No revision recommended	N/A - not applicable	WS5, WS8, WS9, pop-up
Energy Supply	ES 1, ES 2, ES 3	Underserved Communities/Minority Voices	In-language outreach and education	Request for in-language outreach and education	B - No revision recommended	N/A - not applicable	WS8, WS9
Energy Supply	ES 2, ES 3, ES 5	Underserved Communities/Minority Voices	Safety	Existing building power capacity may not be able to handle a transition to all electric appliances which may cause short-circuiting. This may be dangerous for residents, especially the elderly.	B - No revision recommended	N/A - not applicable	WS5, WS9
Energy Supply	N/A	Underserved Communities/Minority Voices	Cultural relevance	Concern that the transition to energy efficient appliances is not culturally relevant (electric stove) and may harm business owners.	B - No revision recommended	N/A - not applicable	WS8, WS9
Energy Supply	ES 4	Underserved Communities/Minority Voices	Workforce development*	Interest in workforce development through City College.	A - CAP revision recommended	Yes	WS5
Building Operations	BO 3	Support	Workforce development	Support for developing workforce while meeting clean energy goals.	B - No revision recommended	N/A - not applicable	WS1, WS4, WS6, WS7, Konveio,
Building Operations	BO 3	Support	Workforce development	Interest in retraining existing workforce to address concerns that electrifications will lead to job losses.	A - CAP revision recommended	Yes	WS1, WS4, WS6, WS7, Konveio, Email
Building Operations	BO 1, BO 2	Support	Building electrification & incentives	Support for replacing high-emitting appliances with electric alternatives, provided these alternatives indeed emit less carbon and are affordable.	B - No revision recommended	N/A - not applicable	WS5, WS7, Konveio, Email, Survey
Building Operations	BO 1, BO 2	Support	Building electrification & incentives	Support for residential electrification incentives/rebates.	B - No revision recommended	N/A - not applicable	WS5, WS7, Konveio, Email, Survey
Building Operations	BO 1, BO 2	Improvement	New and existing building developments and retrofits	Support for passive house building measures.	B - No revision recommended	N/A - not applicable	Konveio

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Building Operations	80 1, BO 2	Support	New and existing building developments and retrofits	Support for requiring solar installation on new/existing buildings.	B - No revision recommended	N/A - not applicable	WS7, Konveio
Building Operations	BO 4	Support	New and existing building developments and retrofits	Support for City setting an aggressive timeline for buildings to replace/switch to low-impact or natural refrigerants.	B - No revision recommended	N/A - not applicable	Konveio, WS1
Building Operations	BO 1, BO 2	Support	Grid resiliency	Support for efforts to increase building and electric grid resiliency in the event of natural disasters, power outages, and sea level rise.	B - No revision recommended	N/A - not applicable	WS1, WS7, Konveio, Email
Building Operations	BO 4	Support	GWP refrigerants	Support for addressing high-GWP refrigerants.	B - No revision recommended	N/A - not applicable	Email
Building Operations	BO 1, BO 2, BO 4	Improvement	Direct homeowner outreach	Interest in providing more direct outreach to individual homeowners.	C - Applicable to future implementation or other resource (eg. Different Plan)	N/A - not applicable	WS2, WS5, WS6, Konveio
Building Operations	BO 1, BO 2	Improvement	Water resiliency	Interest in including strategies that focus on water consumption of buildings, especially as it relates to climate resiliency.	C - Applicable to future implementation or other resource (eg. Different Plan)	N/A - not applicable	WS1, WS4, WS7, Konveio
Building Operations	BO 1, BO 2	Improvement	Transparency & tracking	Interest in a more accurate analysis of tracking emissions instead of the current WRI market-based.	B - No revision recommended	N/A - not applicable	WS7, Konveio
Building Operations	BO 1, BO 2	Improvement	Transparency & tracking	Interest in transparent/updated metrics of energy efficiency available on a website and environmental impact of storage technologies.	C - Applicable to future implementation or other resource (eg. Different Plan)	N/A - not applicable	WS7, Konveio
Building Operations	BO 1	Improvement	Banning natural gas in new construction	Confusion regarding goals and if "new buildings" include residential, commercial, and mixed-use buildings.	B - No revision recommended	N/A - not applicable	WS2, WS3, Konveio
Building Operations	BO 1, BO 2	Improvement	Building codes and permits	Concern that complicated building codes and decarbonize existing and new buildings.	A - CAP revision recommended	Yes	Konveio, Email
Building Operations	BO 1, BO 2	Improvement	Building codes and permits	Interest in applying permit compliance checking for appliance replacements.	C - Applicable to future implementation or other resource (eg. Different Plan)	N/A - not applicable	Konveio, Email
Building Operations	BO 1, BO 2	Improvement	Building codes and permits	Interest in requiring 100% carbon-free power in all new buildings in 2021.	B - No revision recommended	N/A - not applicable	Konveio, Email
Building Operations	BO 1, BO 2	Improvement	Energy efficiency in MF/existing	Interest in installation energy efficient appliances in multifamily construction and existing buildings.	C - Applicable to future implementation or other resource (eg. Different Plan)	N/A - not applicable	WS4, Survey
Building Operations	BO 2	Improvement	Contractor list	Interest in City suggesting experts and qualified contractors to support transition and to help residents and property owners make plans.	C - Applicable to future implementation or other resource (eg. Different Plan)	N/A - not applicable	WS1, WS4
Building Operations	BO 1, BO 2	Improvement	Grid resiliency	Interest in creating grid relationships beyond the building level (resilient infrastructure at the block/neighborhood scale).	C - Applicable to future implementation or other resource (eg. Different Plan)	N/A - not applicable	WS1
Building Operations	BO 1, BO 2	Improvement	Grid resiliency	Interest in creating grid relationships beyond the building level (resilient infrastructure at the block/neighborhood scale).	C - Applicable to future implementation or other resource (eg. Different Plan)	N/A - not applicable	WS1

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Building Operations	ES 1, ES 2	Improvement	Commercial buildings	Concern that Plan does not acknowledge that fuel switching for commercial buildings, when compared to residential buildings, is more complex and would therefore require more time, coordination, and planning.	B - No revision recommended	Agree that electrification of existing large commercial buildings and existing large multifamily buildings with non-standardized central systems is more complex than smaller commercial and residential buildings with 'packaged' systems. This concern is a key reason the Zero Emission Buildings Taskforce included a separate Existing Large Commercial Buildings Workgroup, which was recommended the 2035 target date to reflect the urgency of climate risks facing real estate.	N/A - not applicable	Email
Building Operations	BO 1, BO 2	Improvement	Non-compliance	Interest in City including what would happen to those who don't comply with electrification.	B - No revision recommended	The CAP lays out strategies; the forum to develop critical details will be subsequent engagement with stakeholders and legislative processes.	N/A - not applicable	WS2
Building Operations	BO 1, BO 2	Equity	Cost burden	Concern that the immediate cost shifts from buildings switching to electric will burden small businesses, low-income, and middle-income communities and renters.	B - No revision recommended	Subsequent engagement with stakeholders and legislative proposals would be the forum to refine specific proposals, including related actions proposed in BO 2 and BO 3 that propose actions to provide incentives, education, and technical resources.	N/A - not applicable	WS2, WS4, WS5, WS10, Konweio, Email
Building Operations	BO 1, BO 2	Equity	Cost burden	Concern that low-income residents who cannot afford the replacements will be penalized.	B - No revision recommended	One of the first BO actions is: BO 2-8: By 2023, develop and adopt tenant protection and anti-displacement policies for renters in buildings transitioning to efficient and all-electric systems.	N/A - not applicable	WS2, WS4, WS5, WS10, Konweio, Email
Building Operations	BO 1, BO 2	Equity	Cost burden	Interest in a staggered timeline for each neighborhood based on socioeconomic factors.	B - No revision recommended	ES 5 (Plan for the equitable decommissioning of the city's natural gas system) proposes to develop geographically focused electrification plans.	N/A - not applicable	WS2, WS4, WS5, WS10, Konweio, Email
Building Operations	BO 3	Equity	BIPOC Employment	Support for prioritizing companies that employ local BIPOC individuals.	B - No revision recommended	See BO 3-3.	N/A - not applicable	Konweio
Building Operations	All	Equity	Specific constituencies	Interest in identifying specific constituencies as opposed to simply using the BIPOC acronym to address different and diverse communities.	B - No revision recommended	Actions relating to existing residential were developed through an Anchor Partner Network - a collaboration between Dept of Environment, PODER, and Emerald Cities to engage specific constituencies (workers, tenants, owners, etc.). The CAP is a strategic document which prioritizes racial equity, and some acronyms are helpful for brevity.	N/A - not applicable	WS5
Building Operations	All	Equity	Equitable implementation & outcomes	Support for oversight, accountability, and transparency of strategies.	B - No revision recommended	The CAP is a public proposal to inform and guide subsequent action. Subsequent engagement with stakeholders including legislative proposals would be the forum to refine specific proposals, including metrics and reporting beyond what is specifically addressed in the CAP.	N/A - not applicable	WS5
Building Operations	N/A	Other Considerations	Increased education and outreach	Support for increased public awareness efforts and community outreach to educate homeowners and ease concerns about required changes.	B - No revision recommended	The Clean Energy Buildings Hub (now called 'Climate Equity Hub') proposed in BO3-2 would be responsible for outreach & education to building owners and other customers, residential & commercial. Adequate funding resources are needed to meet the community expectation expressed in this comment.	N/A - not applicable	WS6, WS4, WS5, WS7
Building Operations	All	Other Considerations	Environmental health	Interest in considering health effects from indoor air quality issues.	C - Applicable to future implementation or other resource (eg. Different Plan)	Health effects are cited throughout the narrative of Climate Action Plan.	N/A - not applicable	WS10
Building Operations	All	Other Considerations	Building community support	Interest in developing strong messaging tailored to each audience to build community support and political will.	B - No revision recommended	The Clean Energy Buildings Hub (now called 'Climate Equity Hub') proposed in BO3-2 would be responsible for outreach & education to building owners and other customers, residential & commercial. Adequate funding resources are needed to meet the community expectation expressed in this comment.	N/A - not applicable	WS10
Building Operations	BO-2	Underserved Communities/Minority Voices	Electrification cost incentives & education*	Desire for cost incentives and education for low-income and elderly residents to switch to all electric.	B - No revision recommended	See BO 2-9 and BO 3-2. Elderly residents will need to be included in targeted outreach.	N/A - not applicable	WS5, WS8, WS9
Building Operations	All	Underserved Communities/Minority Voices	Electrification cost incentives & education*	Interest in seeing education and promotion of electrification via continued community workshops and other media/social media.	B - No revision recommended	The Clean Energy Buildings Hub (now called 'Climate Equity Hub') proposed in BO3-2 would be responsible for outreach & education to building owners and other customers, residential & commercial. Adequate funding resources are needed to meet the community expectation expressed in this comment.	N/A - not applicable	WS8, WS9
Building Operations	N/A	Underserved Communities/Minority Voices	Transparency*	Emphasized the need for transparency with goal progress (emissions reductions/costs) via a dashboard.	B - No revision recommended	See: San Francisco Climate Dashboard (SFEnvironment.org/sf-climate-dashboard)	N/A - not applicable	WS5, WS8, WS9

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Building Operations	N/A	Underserved Communities/Minority Voices	State funding*	Would like the City to continue working with the State to secure funding for electrification. Worried that progressive cities get less state funding.	B - No revision recommended	N/A - not applicable	WS8
Building Operations	80-1, 80-2, 80-3	Underserved Communities/Minority Voices	Decarbonization	Support for decarbonization and moving away from fossil fuels.	B - No revision recommended	N/A - not applicable	WS8
Transportation and Land Use	TLU 1	Support	Public transit	Support for improving MUNI (safety, reliability, speed, service area).	B - No revision recommended	N/A - not applicable	WS5, WS7, WS10, WS11, Konveio, Email, Survey
Transportation and Land Use	TLU 1	Support	Public transit	Support for setting goals around transit speed and reliability.	B - No revision recommended	N/A - not applicable	WS5, WS7, WS10, WS11, Konveio, Email, Survey
Transportation and Land Use	TLU 5	Support	Transit-oriented development	Support for transit-oriented development.	B - No revision recommended	N/A - not applicable	WS4, WS6, Konveio, Email, Survey
Transportation and Land Use	TLU 5	Support	Transit-oriented development	Support for a streamlined approval process for housing near transit.	B - No revision recommended	N/A - not applicable	WS4, WS6, Konveio, Email, Survey
Transportation and Land Use	TLU 4	Support	Reducing VMT	Support for reducing VMT by increasing the cost of parking and using parking resources more efficiently.	B - No revision recommended	N/A - not applicable	WS1, WS2, WS5, WS10, Konveio
Transportation and Land Use	TLU 2	Support	Bicycling	Support for the City defending bicycling just as much as pedestrians or cars. Start shifting from "streets for cars", to "streets for people."	B - No revision recommended	N/A - not applicable	WS1, WS2, WS7, Konveio
Transportation and Land Use	TLU 2	Support	Bicycling	Support for adding more protected bike lanes.	C - Applicable to future implementation or other resource (eg. Different Plan)	N/A - not applicable	WS1, WS2, WS7, Konveio
Transportation and Land Use	TLU 2	Support	Bicycling	Support for making electric bikes more affordable.	B - No revision recommended	N/A - not applicable	WS1, WS2, WS7, Konveio
Transportation and Land Use	TLU 6	Support	Density and Diversity	Support for increasing density, diversity of land uses, and location efficiency across San Francisco.	B - No revision recommended	N/A - not applicable	WS 6, Survey
Transportation and Land Use	TLU 4	Support	Parking	Support for parking permits.	B - No revision recommended	N/A - not applicable	Email
Transportation and Land Use	TLU 3	Support	Pricing tools	Support for equitable pricing tools.	B - No revision recommended	N/A - not applicable	Email
Transportation and Land Use	TLU 6	Improvement	Transit-oriented development	Interest in developing housing along bike corridors in addition to near public transit.	B - No revision recommended	N/A - not applicable	WS2, WS4, WS5, WS6, WS7, Konveio, Email
Transportation and Land Use	TLU 6	Improvement	Transit-oriented development	Interest in investing the additional revenue from upzoning the corridors into community benefits.	B - No revision recommended	N/A - not applicable	WS2, WS4, WS5, WS6, WS7, Konveio, Email
Transportation and Land Use	TLU 2	Improvement	Bike access and safety	Interest in more communal storage/bike racks in garages and ways to discourage bike theft.	B - No revision recommended	N/A - not applicable	WS2, WS10, Konveio
Transportation and Land Use	TLU 2	Improvement	Bike access and safety	Interest in bikeshares.	A - CAP revision recommended	N/A - not applicable	WS2, WS10, Konveio
Transportation and Land Use	TLU 2	Improvement	Bike access and safety	Interest in enforcing bicyclists to adhere to the laws.	B - No revision recommended	N/A - not applicable	WS2, WS10, Konveio
Transportation and Land Use	TLU 2	Improvement	Bike access and safety	Interest in making installing bike racks easier (not requiring months of community hearings).	A - CAP revision recommended	N/A - not applicable	WS2, WS10, Konveio
Transportation and Land Use	TLU 1	Improvement	Transit	Support for making public transit free for all riders. Support for free transit passes for residents.	B - No revision recommended	N/A - not applicable	WS7, Konveio

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Transportation and Land Use	TLU 1	Improvement	Transit	Interest in developing apps that track public transit options to make them more reliable.	C - Applicable to future implementation or other resource (eg. Different Plan)	These exist and are led by private sector -- muni integrates data to support this and provides next muni (epp)	N/A - not applicable	WS11
Transportation and Land Use	TLU 1	Improvement	Transit	Interest in requesting more frequent cleaning of buses and trains so they are more pleasant to ride.	C - Applicable to future implementation or other resource (eg. Different Plan)	This does not necessarily rise to the level of inclusion in the CAP. Cleaning practices have improved drastically during COVID shutdown.	N/A - not applicable	Konveio
Transportation and Land Use	TLU 1	Improvement	Transit	Interest in considering giving all buses priority at intersections, raising MUNI trains on a platform, and/or adding more bus-only lanes.	B - No revision recommended	TLU.1 includes multiple actions that call for bus-only lanes and Muni Forward actions. The ConnectSF TCS action (TLU.1-1) would include more of this work to achieve the 5-min network.	N/A - not applicable	Konveio
Transportation and Land Use	N/A	Improvement	Transit	Interest in eliminating low-use MUNI routes and subsidizing ride-share fares for needy riders.	B - No revision recommended	Low-use routes are currently removed because of the pandemic and the 5min frequent network reimagines the transit network for ridership and frequency. Subsidies exist in the Essential Trip Card and transit discounts are in place for specific groups. Rideshare has been showed to have negative impacts on traffic and environment.	N/A - not applicable	Konveio
Transportation and Land Use	TLU 1	Improvement	Transit	Interest in focusing on all city stations and off-peak hours, as opposed to focusing most services and funding on the peak hours downtown.	C - Applicable to future implementation or other resource (eg. Different Plan)	The TCS is focused on studying transit network needs based on citywide travel, rather than peak hour only and downtown travel.	N/A - not applicable	Email
Transportation and Land Use	TLU 7	Improvement	Reducing VMT	Concern that EVs are not a sustainable solution to cars. Car tires are polluting, and cars take up parking and road space and mainly benefit wealthy people.	B - No revision recommended	The City's goal is 80% low-carbon trips via transit, walking, biking. Transit and biking are not sufficient substitutes to vehicles for the mobility access for some individuals, including people with physical disability. EV Roadmap calls for 100% zero-emission vehicle sales by 2050 and all transportation by 2040.	N/A - not applicable	WS4, Konveio
Transportation and Land Use	TLU 7	Improvement	Reducing VMT	Interest in installation of EV chargers in multifamily construction and existing buildings.	b - No revision recommended	EV Ready Building ordinance requires that 20% of parking spaces are EV charging ready in new construction and major rehabs. TLU7-2 includes expansion of citywide charging infrastructure, including at least one fast charging hub in a disadvantaged community.	N/A - not applicable	WS4, Konveio
Transportation and Land Use	TLU 7	Improvement	Reducing VMT	Interest in phasing out conventional commercial and delivery vehicles, cabs, and ride-hailing vehicles.	B - No revision recommended	TLU7-3 includes infrastructure planning to support CCSF non-revenue and small business medium/heavy duty vehicles. CARB Advanced Clean Fleets Regulation will require large delivery companies and CCSF fleet to procure 100% ZEV trucks by 2027.	N/A - not applicable	WS4, Konveio
Transportation and Land Use	TLU 7	Improvement	Reducing VMT	Interest in the City leading by example and making all City-owned vehicles/bikes electric (if not already).	B - No revision recommended	TLU7-4 will establish a standard to prioritize ZEV's for TNCs operating at the airport. CARB's Clean Miles Standard requires TNC's to increase electric miles to 60-90% of total by 2030 (rules pending). Lyft and Uber have committed to 100% zero emission by 2030.	N/A - not applicable	WS4, Konveio
Transportation and Land Use	TLU 3	Improvement	Pricing tools	Interest in additional pricing tools to capture the full range of climate externalities associated with driving private cars and advancing equity.	B - No revision recommended	Ordinance [403(b)(4)] calls for adding additional vehicle classes as these vehicles become commercially available.	N/A - not applicable	Email
Transportation and Land Use	TLU 2	Improvement	Household transport	Interest in the City offering a transportation audit per household to identify transportation needs and make recommendations for shifts to align with Plan goals.	C - Applicable to future implementation or other resource (eg. Different Plan)	CARB Advanced Clean Fleets Regulation will require large delivery companies and CCSF fleet to procure 100% ZEV trucks by 2027. TLU7-3 includes infrastructure	N/A - not applicable	Konveio
Transportation and Land Use	TLU 6	Equity	Zoning	Interest in up-zoning parts of the city that were founded as Whites-only communities.	B - No revision recommended	The city does a household travel and travel decision survey to understand transportation needs citywide.	N/A - not applicable	Konveio
Transportation and Land Use	TLU 6	Equity	Zoning	Interest in expanding multifamily zoning to all neighborhoods, not just in transit corridors to combat environmental injustice.	B - No revision recommended	See multiple actions in Housing strategies H.1 and H.2	N/A - not applicable	WS2, WS4, WS5, WS6, WS7, WS10, Konveio
Transportation and Land Use	TLU 6	Equity	Zoning	Concern that a NIMBY neighborhood will resist sustainable transit options and transit-oriented development.	B - No revision recommended	Already an action TLU 6-2: "Examine rezoning to allow for multi-family housing throughout San Francisco."	N/A - not applicable	WS2, WS4, WS5, WS6, WS7, WS10, Konveio
Transportation and Land Use	TLU 6	Equity	Zoning		B - No revision recommended	This is a long-standing challenge with multiple dimensions that many cities face.	N/A - not applicable	WS2, WS4, WS5, WS6, WS7, WS10, Konveio

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Transportation and Land Use	TLU 7	Equity	Cost burden	Concern that electric charging is not accessible and expensive.	B - No revision recommended	TLU7-2 includes expansion of citywide charging infrastructure, including at least one fast charging hub in a disadvantaged community.	N/A - not applicable	WS1, WS5, WS10, Konveio
Transportation and Land Use	TLU 2	Equity	Cost burden	Concern that restricting e-bike subsidies to low-income people will not be as effective because weather people are doing most of the driving.	B - No revision recommended	TLU7-2 aims at promoting equity in access not subsidizing wealthy individuals e-bike purchases	N/A - not applicable	WS1, WS5, WS10, Konveio
Transportation and Land Use	TLU 4	Equity	Cost burden	Concern that simply increasing the cost of car ownership without providing easy-to-use alternatives will further punish communities of color.	B - No revision recommended	Strategies one and two are all about making the system better and expanding transit access, especially to low-income households and communities of concern. These are necessary steps to make pricing equitable. Pricing measures also generate needed funds that allow for the improvement of the transit system.	N/A - not applicable	Email
Transportation and Land Use	TLU 1, TLU 2	Other Considerations	Pandemic	Concern that pandemic has moved the City and the residents in the wrong direction.	B - No revision recommended	SFMTA had to make tough decisions due to budget shortfalls. Immediate recovery efforts and TCS/SFS are aimed at connecting this path, and bringing transit back stronger than before the pandemic.	N/A - not applicable	WS1, WS2, WS5, WS7, Konveio
Transportation and Land Use	TLU 3, TLU 7	Other Considerations	Commuters	Concern that many commuters and other drivers come from outside of the city and county. Therefore, local policies won't be as effective. Need for coordination on a regional scale.	B - No revision recommended	TLU1-8 calls more effective regional coordination.	N/A - not applicable	WS3, Survey
Transportation and Land Use	TLU 6	Other Considerations	City "charm"	Concern of finding the balance of upzoning and keeping the charm and history of the city (e.g., old Victorian homes) that draw residents and tourists.	B - No revision recommended	This is a long-standing challenge with multiple dimensions that many cities face.	N/A - not applicable	Konveio
Transportation and Land Use	TLU 5	Other Considerations	CEQA	Interest in removing the appeal process in CEQA which slows down transit oriented or affordable housing development.	B - No revision recommended	Staff supports policy changes that would accelerate climate action.	N/A - not applicable	Konveio, Survey
Transportation and Land Use	TLU 1	Other Considerations	Transit First policy	Concern that city is not living up to its Transit First policy.	B - No revision recommended	The CAP TLU actions paired with ConnectSF and other ongoing efforts is aiming to advance transit first policy.	N/A - not applicable	Email, Survey
Transportation and Land Use	TLU 1	Underserved Communities/Minority Voices	Convenience	Support for expanding the public transportation network, more direct routes for longer distances, and creating more regional connections.	B - No revision recommended	TLU1 addresses all of these concerns; ConnectSF expands the transit network and creates more and better regional connections. Longer regional trips will be supported with better direct connections, while the transit network in the city will be redesigned to facilitate more diverse trips with speedy and efficient transfers	N/A - not applicable	WS5, WS8, WS9
Transportation and Land Use	TLU 1, TLU 2	Underserved Communities/Minority Voices	Safety	Interest in increasing safety and security on public transit.	B - No revision recommended	Action for the SFMTA's ambassador program is included to support safety improvements.	N/A - not applicable	WS5, WS8, WS9
Transportation and Land Use	TLU 1, TLU 2, TLU 2	Underserved Communities/Minority Voices	Education and perception	Interest in City campaigns or programs catered to different communities to spur behavior change around public transit.	A - CAP revision recommended	See TLU 7-1	N/A - not applicable	WS5, WS8, WS9
Transportation and Land Use	TLU1, TLU 2	Underserved Communities/Minority Voices	Reliability*	Interest in a one-stop-shop for real-time transit and traffic updates - that is simple and user friendly for all populations.	B - No revision recommended	See multiple actions in TLU1 and TLU 7-1	N/A - not applicable	WS8, WS9
Transportation and Land Use	TLU1, TLU 2	Underserved Communities/Minority Voices	Reliability*	Interest in timing of public transit being more reliable.	B - No revision recommended	See multiple actions in TLU1	N/A - not applicable	WS8, WS9
Transportation and Land Use	TLU1, TLU 2	Underserved Communities/Minority Voices	Reliability*	Suggestion for routine route audits to adjust frequency according to demand.	B - No revision recommended	There are many factors that influence transit planning decisions beyond just ridership. Simplifying that decision by implementing a simple ridership audit is not advisable.	N/A - not applicable	WS8, WS9
Transportation and Land Use	TLU5	Underserved Communities/Minority Voices	Increased density	Concern that encouraging high density development will negatively impact housing costs, health conditions, and displacement.	B - No revision recommended	Multiple Housing actions in H.1 and H.2 focus on supporting low-and-middle income residents through community stabilization programs, rehabilitation of existing housing, and finding ways to reduce construction costs for development.	N/A - not applicable	WS5
Housing	Sector goal	Support	Housing development	Support for new housing, especially infill development.	B - No revision recommended	Yes, various strategies in the Housing and Transportation and Land Use sections support infill development. Within the Housing Chapter, strategies H3-1, H2-2, and H4-1 Thanks for the support See strategy H 3-2	N/A - not applicable	Survey
Housing	H 3	Support	Process streamlining	Support for streamlining the planning and building process.	B - No revision recommended		N/A - not applicable	Konveio

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Housing	H2, H 3	Support	Underutilized buildings	Support for redeveloping and renovating underutilized buildings to contribute to housing goals.	C - Applicable to future implementation or other resource (eg. Different Plan)	While perceptions of what are "underutilized" buildings or parcels likely vary, the CAP and other housing policy efforts under way such as the 2022 Housing Element Update, include policies to expand housing capacity in commercial and residential districts (including single family areas) while protecting rental housing occupied by low and moderate income renters. See strategy H1-3	N/A - not applicable	WS6
Housing	H1	Support	Expanding tenant services	Support for financially supporting affordable housing for BIPOC communities by expanding tenant services.	B - No revision recommended		N/A - not applicable	Konveio
Housing	H 3, H 4	Improvement	Affordability	Concern that affordable housing may not be cost-effective for developers. Interest in:		This is the beginning comment that is then followed by points below.		WS5, WS6, WS11, Konveio
Housing	H 3, H 4	Improvement	Affordability	granting surplus City-owned land at no cost to non-profit developers to build affordable housing and maximize the density.	A - CAP revision recommended	Added language that public surplus land will continue to be prioritized for affordable housing based on timing, financial feasibility, and other community needs.		WS5, WS6, WS11, Konveio
Housing	H 3, H 4	Improvement	Affordability	Developing more affordable units lower in new buildings and in less desirable harder to rent/sell facings.	B - No revision recommended	In the interest of equity, City policy is to require inclusionary on-site affordable units to be distributed throughout the building, however, for buildings over 120 feet, affordable units may be located in the lower two thirds of the building. (see page 57 of the MOHCD Inclusionary Manual for details https://simohcd.org/sites/default/files/Documents/MOH/Inclusionary%20Manual%2010.15.2018.pdf)	N/A - not applicable	WS5, WS6, WS11, Konveio
Housing	H 3, H 4	Improvement	Affordability	providing a density bonus to effectively reduce the land cost per unit or to offer direct affordable housing grants to developers.	C - Applicable to future implementation or other resource (eg. Different Plan)	Various strategies reference incentivizing more housing and more affordable housing for vulnerable groups, which include density bonuses, and there are various density bonuses already in place in SF including state density bonus, HOMESE, and Proposition E (2019)	N/A - not applicable	WS5, WS6, WS11, Konveio
Housing	H 3, H 4	Improvement	Affordability	Interest in the City requiring a certain number of affordable units to be built and leased before allowing any new market rate housing.	B - No revision recommended	Meeting housing targets across all incomes is important and the City has struggled to meet the Mayor's goal of 5,000 units per year. In addition, market rate housing often funds affordable housing either through on-site inclusionary units and in-lieu fees, or through increased property tax revenue from new buildings. As a result, restricting market rate could be counterproductive to meeting affordable targets	N/A - not applicable	WS5, WS6, WS11, Konveio
Housing	H 3, H 4	Improvement	Affordability	Interest in replacing rent control with a rent subsidy based on each tenant's tax returns.	B - No revision recommended	This proposed approach to rent control would be a significant departure in local policy and would need to be developed with substantial input from community members and adopted by elected officials	N/A - not applicable	WS5, WS6, WS11, Konveio
Housing	H 1, H 2, H 3, H 4	Improvement	Green and resilient housing	Interest in the City setting requirements for sustainable water systems in all new housing.	B - No revision recommended	All new construction and substantial renovations require water-efficient fixtures per the Building Code and LEED, developments 250,000 SF and larger are required to treat and reuse non-potable water onsite, projects 40k+ must complete a water-balance model for SFPUC.	N/A - not applicable	WS1, WS2, WS3, WS4, WS11, Konveio
Housing	H 1, H 2, H 3, H 4	Improvement	Green and resilient housing	Interest in planning for resilient housing prior to construction as opposed to afterwards.	B - No revision recommended	See also Buildings Chapter, Hazards & Climate Resilience Plan, current building code, and new stormwater management mapping for how new housing supports resilience.	N/A - not applicable	WS1, WS2, WS3, WS4, WS11, Konveio
Housing	N/A	Improvement	Goals and targets	Mixed feelings about the feasibility of the sector goal. Some think the sector goal is too low, while others think the sector goal is unrealistic. With the housing shortage and growing industry, more units are needed to increase housing affordability, especially for BIPOC residents.	B - No revision recommended	While there are a number of ideas included in this comment we feel it aligns with various strategies and goals articulated.	N/A - not applicable	WS2, WS3
Housing	H 3	Improvement	Goals and targets	Interest in aligning Strategy 3 with Transportation and Land Use: expanding transit access and options and making sure housing density aligns with access to transit, businesses, and services, especially schools.	B - No revision recommended	Action H-3-1 largely aligns with this comment; Please see also the Transportation and Land Use Chapter.	N/A - not applicable	Konveio

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Housing	H 1	Improvement	Community	Interest in adding support of site-based community building.	Actions H1-1 and H1-2 emphasize using policy to address the needs of people of color and supporting cultural districts and other priority geographies to support communities and the stability and return of residents and businesses, which can include community facilities. Housing, including affordable housing, includes open space requirements on-site; please see also the Healthy Ecosystems chapter. The City already works closely with nonprofit affordable developers and labor, and facilitates community advisory committees. We agree to distributing affordable housing broadly in the city, particularly in higher opportunity areas, as emphasized in H1-4 and H4-1, as well as investment in cultural districts, as in H1-2. Agree, this is addressed in H3-1 and H4-1 These two goals are not mutually exclusive. Subsidized affordable housing is part of how housing affordability is improved along with increased housing production overall, stabilization and protection strategies, construction and process cost reductions. Housing element is focused on these issues and includes extensive data on racial inequities related to income and housing Addressed in various strategies but particularly H1-1 and H-2	Email
Housing	N/A	Improvement	Affordable housing green space	Interest in seeing green space access requirements for affordable housing.	B - No revision recommended	WS6
Housing	H 3	Improvement	Partnerships	Interest in City forming formal connections between non-profits, trade groups, and other organizations.	B - No revision recommended	WS1
Housing	H 1, H 3, H 4	Equity	Affordability	Interest in distributing affordable housing through all neighborhoods unless BIPOC communities requested housing in cultural districts.	B - No revision recommended	WS1, WS2, WS5, WS7, WS10, Konveio, Survey
Housing	H 1, H 3, H 4	Equity	Affordability	Interest in developing affordable housing near goods and services.	B - No revision recommended	WS1, WS2, WS5, WS7, WS10, Konveio, Survey
Housing	H 1, H 3, H 4	Equity	Affordability	Interest in solutions that build housing affordability, as opposed to affordable housing.	B - No revision recommended	WS1, WS2, WS5, WS7, WS10, Konveio, Survey
Housing	H 1, H 3, H 4	Equity	Affordability	Interest in making explicit the housing burden by race and outlining the historic inequities that mean current BIPOC communities are overburdened with housing costs.	C - Applicable to future implementation or other resource (eg. Different Plan)	WS1, WS2, WS5, WS7, WS10, Konveio, Survey
Housing	H 1	Equity	Gentrification	Interest in supporting small businesses and protecting the area from gentrification. Interest in protecting current communities from displacement.	B - No revision recommended	WS5, WS6, WS11
Housing	H 4	Equity	Combating multi-generational poverty	Interest in introducing and growing new land and building ownership models that cultivate community and begin to grow wealth in communities with multi-generational poverty.	B - No revision recommended	Email
Housing	H 2	Other Considerations	Resistance	Concern about resistance to building affordable housing sites, larger buildings, and shelters for unhoused people.	B - No revision recommended	WS2, WS3, WS10, WS11
Housing	H 1, H 2, H 4	Other Considerations	Inclusion of the middle class	Mixed interests in who to focus on in these strategies. Some believe that strategies need to include the lower middle class as well, while others believe that all the resources that go to the middle class are further overburdening lower-income BIPOC communities.	B - No revision recommended	WS7, WS11, Konveio
Housing	N/A	Other Considerations	Terms	Confusion about what "affordable" means in the context of the 50% affordable housing goal.	B - No revision recommended	WS6, WS7
Housing	N/A	Other Considerations	Scale	Concern that housing issues are regional and some affected by SF's housing policies live outside of the city.	B - No revision recommended	WS5
Housing	H 1, H 2	Other Considerations	Housing quality	Interest in the City discussing the quality of new housing.	B - No revision recommended	WS10

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Responsible Production & Consumption	RPC 3	Improvement	Reuse of goods and services	Interest in limiting virgin plastic items and single-use items and closing loopholes in the current plastic bag ban.	B - No revision recommended	Comment on limiting virgin plastic and single use supports existing language on reducing non-reusables, reuse, repair etc.. Comment on closing loophole in plastic bag ban more suitable for future implementation of policy and not in CAP. Addressed in RPC 3-2.	N/A - not applicable	WS1, WS4, WS7, Konveio, Survey
Responsible Production & Consumption	RPC 3	Improvement	Reuse of goods and services	Interest in seeing textiles and clothing products mentioned in the measures.	B - No revision recommended		N/A - not applicable	WS1, WS4, WS7, Konveio, Survey
Responsible Production & Consumption	RPC 3	Improvement	Reuse of goods and services	Interest in banning or taxing unsustainable materials.	B - No revision recommended		N/A - not applicable	WS1, WS4, WS7, Konveio, Survey
Responsible Production & Consumption	RPC 3	Improvement	Waste reduction, recycling, and compost	Interest in pressuring companies to reduce packaging or incorporate environmentally friendly packaging options.	A - CAP revision recommended		Yes	WS4, WS10, WS11, Konveio
Responsible Production & Consumption	RPC 3	Improvement	Waste reduction, recycling, and compost	Interest in re-introducing materials drop-off locations in the city.	B - No revision recommended		N/A - not applicable	WS4, WS10, WS11, Konveio
Responsible Production & Consumption	RPC 3	Improvement	Waste reduction, recycling, and compost	Interest in providing biogas digesters and compostable bags in parks to divert dog waste.	C - Applicable to future implementation or other resource (eg. Different Plan)		N/A - not applicable	WS4, WS10, WS11, Konveio
Responsible Production & Consumption	RPC 3	Improvement	Waste reduction, recycling, and compost	Interest in getting SF access to anaerobic digester at Recology.	C - Applicable to future implementation or other resource (eg. Different Plan)		N/A - not applicable	WS4, WS10, WS11, Konveio
Responsible Production & Consumption	RPC 5	Improvement	Education & outreach	Interest in educating community, particularly students, about the link between soil health, foods, and human health.	B - No revision recommended		N/A - not applicable	WS3, WS6, WS6, WS11, Konveio
Responsible Production & Consumption	RPC 5	Improvement	Education & outreach	Interest in engaging communities to buy local and sustainable products, if they need to buy at all.	B - No revision recommended		N/A - not applicable	WS3, WS6, WS6, WS11, Konveio
Responsible Production & Consumption	RPC 1	Improvement	Building materials	Interest in reusing construction and demolition materials.	B - No revision recommended		N/A - not applicable	WS4, Konveio, Survey
Responsible Production & Consumption	RPC 1	Improvement	Building materials	Interest in limiting cement use in San Francisco.	B - No revision recommended		N/A - not applicable	WS4, Konveio, Survey
Responsible Production & Consumption	RPC 1	Improvement	Building materials	Interest in using a lighter colored alternative to the cement/asphalt currently used in some city sidewalks.	C - Applicable to future implementation or other resource (eg. Different Plan)		N/A - not applicable	WS4, Konveio, Survey
Responsible Production & Consumption	RPC 1	Improvement	Building materials	Interest in seeking out architects using decarbonizing building practices such as mass timber.	B - No revision recommended		N/A - not applicable	WS4, Konveio, Survey
Responsible Production & Consumption	RPC 1, RPC3	Improvement	Building materials	Interest in considering fence material made from plastic detergent jugs.	B - No revision recommended		N/A - not applicable	WS4, Konveio, Survey
Responsible Production & Consumption	RPC 1	Improvement	Building materials	Interest in mentioning steel in the measures.	B - No revision recommended		N/A - not applicable	WS4, Konveio, Survey

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Responsible Production & Consumption	Improvement	Workforce development	Interest in retraining and retaining blue collar employees who get displaced.	C - Applicable to future implementation or other resource (eg. Different Plan)	RPC strategies that might possibly create displacement also can result in new jobs. Retraining and retaining can be addressed in future implementation as needed if there is displacement.	WS10, WS11
Responsible Production & Consumption	Improvement	Workforce development	Interest in local recycling and local green jobs.	B - No revision recommended	Comment supports language that creates new local jobs, including recycling, such as in RPC 1-4, 1-6, and potentially in RPC 2 and 3.	WS4
Responsible Production & Consumption	Improvement	Food and plant-based diets	Interest in the promotion of regenerative agriculture products as part of a Food Waste Prevention and Edible Food Recovery Policy.	A - CAP revision recommended	In RPC 2-5 added regenerative agriculture language, and can be considered in any future food policy (RPC 2-3).	WS7, Konveio
Responsible Production & Consumption	Improvement	Consumption emissions	Interest in seeing a specific goal around consumption emissions that includes the production and transportation of the goods and other stages of the life cycle.	B - No revision recommended	CAP in a different chapter (as I understand) will include a CBEI goal that include life cycle emissions	WS7, Konveio
Responsible Production & Consumption	Improvement	Reporting requirements	Interest in requiring Environmental Product Declarations (EPDs) that identify total embodied carbon of different categories of products.	B - No revision recommended	Together with Life Cycle Assessments, Environmental Product Declarations will be a key documentation and compliance mechanism for RPC 1-1.	WS1
Responsible Production & Consumption	Improvement	Other modes	Interest in including plans to curb aviation and maritime emissions.	B - No revision recommended	RE: aviation emissions, see RPC 4: Lead the aviation sector by reducing emissions across the airline passenger journey; and RPC 4-2: SFO will continue its leadership and partnership with airlines to work to replace up to 50% of its fuel supply with Sustainable Aviation Fuels by 2050.	WS1
Responsible Production & Consumption	Improvement	Community	Support facilitating the creation of inclusive and networked neighborhood scale projects.	B - No revision recommended	Addressing maritime emissions is challenging because emissions from large maritime ships, boats, and off-road equipment are currently beyond the control of the city. San Francisco will continue to work with state and federal entities to find ways to reduce these emissions.	N/A - not applicable
Responsible Production & Consumption	Equity	Impact on businesses	Concern that the goal will disproportionately impact BIPOC-, locally-owned, or small businesses.	B - No revision recommended	Comment supports language in RPC 3-3.	Email
Responsible Production & Consumption	Equity	Access to food	Interest in providing access to fresh produce in certain districts that previously did not have access.	A - CAP revision recommended	Before implementation, all actions will be subject to a Racial Equity Scan and Coeffects Assessment as well as engagement with impacted individuals/businesses. Also see RPC 1-6, RPC 2-2, RPC 3-3 for actions that explicitly respond to an identified	WS6
Responsible Production & Consumption	Equity	Access to food	Interest in making sure that donation centers stay culturally relevant to recipients.	C - Applicable to future implementation or other resource (eg. Different Plan)	RPC 2-2 added language to include providing recovered fresh produce to communities with limited access.	WS6
Responsible Production & Consumption	Other Considerations	COVID	Interest in addressing impacts of COVID-19 on responsible production and consumption.	B - No revision recommended	Agree with this suggestion, need ideas and resources to implement.	WS6
Responsible Production & Consumption	Other Considerations	Community gardens	Question about where community gardens fit in this goal.	C - Applicable to future implementation or other resource (eg. Different Plan)	COVID impacts have been considered and reflected in extending some timelines and some strategies address impacts such as with adaptive reuse of office spaces in RPC 1-2.	WS1, WS6, WS7
Responsible Production & Consumption	Other Considerations	Community gardens	Interest in encouraging landlords to optimize unused space such as a community garden.	C - Applicable to future implementation or other resource (eg. Different Plan)	Consumption patterns were impact especially with restaurant closure and shift to delivery but with recovery consumption patterns are changing.	WS10, Konveio
Responsible Production & Consumption	Other Considerations	Corporate responsibility and enforcement	Interest in focusing efforts to ensure responsible consumption and production on consumers, not on consumers.	B - No revision recommended	Current CAP doesn't discuss community gardens. SFE currently supports community gardens typically through our zero waste grant program by providing free backyard composting training programs and GCETP- Gardening Composting Educator Training Program which trains residents to maintain community gardens throughout SF.	WS10, Konveio
Responsible Production & Consumption	Other Considerations	Corporate responsibility and enforcement	Interest in focusing efforts to ensure responsible consumption and production on consumers, not on consumers.	B - No revision recommended	Current CAP doesn't discuss community gardens. SFE currently supports community gardens typically through our zero waste grant program by providing free backyard composting training programs and GCETP- Gardening Composting Educator Training Program which trains residents to maintain community gardens throughout SF.	Konveio

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Responsible Production & Consumption	N/A	Other Considerations	Corporate responsibility and enforcement Other materials	Concern of how the City will hold companies accountable for lifecycle emissions and new standards for materials. Interest in including e-waste.	C - Applicable to future implementation or other resource (eg. Different Plan) A - CAP revision recommended	How the City can leverage its legal authority to hold companies accountable will be addressed as policies and programs are developed and implemented in the future. Added electronics to RPC 3-3.	N/A - not applicable Yes No N/A - not applicable	WS2 WS2 WS3 W5, W8, W9
Responsible Production & Consumption	RPC 3	Other Considerations	Other materials	Interest in including e-waste.	A - CAP revision recommended	Added electronics to RPC 3-3.	Yes	WS2
Responsible Production & Consumption	N/A	Other Considerations	Legal authority	Concern about how the City will enforce waste and food systems outside of the city.	B - No revision recommended	San Francisco does not have powers to enforce food system waste outside of our jurisdictional boundaries.	No	WS3
Responsible Production & Consumption	RPC1, RPC 2, RP	Underserved Communities/Minority Voices	Restrictions for producers*	Interest in seeing City or state set limitations for production (permitting for production and penalties for overproduction).	B - No revision recommended	It is unclear if this comment is directed at consumer product manufacturers or building developers (both or neither?) Generally speaking, San Francisco has committed to reduce the generation of new items 15% by 2030 using a 2015 baseline. The solutions will look different for different sectors of industry. For example, for the building industry, this translates to incentives for adaptive reuse, infrastructure/policies/programs to support building material reuse, and policy to cap the waste generated on a construction site (per square foot of development) while also mandating deconstruction and source separation to increase the potential for rescue. As it relates to restaurants and food waste, see RPC 2-4.	N/A - not applicable	W5, W8, W9
Responsible Production & Consumption	RPC1, RPC 2, RP	Underserved Communities/Minority Voices	Restrictions for producers*	Interest in City and state increasing sustainability standards for producers.	B - No revision recommended	The City has an Environmentally Preferable Purchasing Ordinance (Environment Code Chapter 2), as well as regulations that define sustainability requirements for a range of product categories. These are updated and expanded regularly and can be reviewed online at www.SFapproved.org. As it relates to RPC 1, by introducing embodied carbon reductions for building materials, producers are being held accountable to reduce the impacts of material extraction, manufacture, and transport - as well as other product impacts that are outside the direct producer's sphere of influence.	N/A - not applicable	W5, W8, W9
Responsible Production & Consumption	RPC 5	Underserved Communities/Minority Voices	Clear education and resources*	Interest in clear/simple communication, education, and resources for residences.	B - No revision recommended	There was not capacity to administer a community challenge, so strategy RPC 5 was removed from CAP	N/A - not applicable	W5, W8, W9
Responsible Production & Consumption	RPC 5	Underserved Communities/Minority Voices	Clear education and resources*	Interest in educating children about RPC practices and provide funding to teach in schools.	A - CAP revision recommended	There was not capacity to administer a community challenge, so strategy RPC 5 was removed from CAP	Yes	W5, W8, W9
Responsible Production & Consumption	RPC 3	Underserved Communities/Minority Voices	Support for small businesses*	Interest in the City providing financial support for restaurants and other small businesses to encourage RPC practices.	A - CAP revision recommended	Added word "supporting" in RPC 3-1 financial support and assistance for is being implemented in starting in 2021-2022.	Yes	W5, W9
Responsible Production & Consumption	N/A	Underserved Communities/Minority Voices	COVID*	Do these strategies and actions take into account COVID-19 or any type of other pandemic/emergency response in the future?	A - CAP revision recommended	Consideration was given to pandemic impacts over time and some strategies modified or extended timewise to allow recovery time. Recommend extend date from 2023 to 2024 for RPC 3-1. Future is uncertain and don't see further need for revisions.	Yes	W8
Healthy Ecosystems	HE 5	Support	Urban greening/forestry	Support for planting street trees, native trees, and preserving existing mature trees.	B - No revision recommended	Included in HE 4 and HE 5.	N/A - not applicable	Survey
Healthy Ecosystems	HE 5, HE 6	Support	Urban greening/forestry	Support for increased funding for urban forestry/ecosystem stewardship programs.	B - No revision recommended	Funding and Capacity Needs apply to entire CAP, and so are addressed appropriately more broadly.	N/A - not applicable	WS3, Konveio, Survey
Healthy Ecosystems	HE 5, HE 6	Support	Urban greening/forestry	Support for creating wildlife corridors around the city and converting concrete/AstroTurf to planters and green spaces especially in underutilized areas.	B - No revision recommended	Addressed in Healthy Ecosystems sector chapter	N/A - not applicable	WS3, Konveio, Survey
Healthy Ecosystems	HE 2	Improvement	Community involvement and education	Interest in funding community participation and providing financial incentives to businesses and residents to encourage living architecture and native plants in gardens and nurseries.	A - CAP revision recommended	Addressed in HE 6-2.		WS1, WS5, WS6, WS7, WS11, Konveio, Email

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Healthy Ecosystems	HE 2	Improvement	Community involvement and education	Interest in active communication between community and the city during greening projects.	A - CAP revision recommended	Changes made to HE 2-1 and 2-2.	WS1, WS5, WS6, WS7, WS11, Konveio, Email
Healthy Ecosystems	HE 2	Improvement	Community involvement and education	Interest in partnering with schools and other organizations like architecture firms for stewardship work.	A - CAP revision recommended	Changes made to HE 2-1 and 2-2.	WS1, WS5, WS6, WS7, WS11, Konveio, Email
Healthy Ecosystems	HE 2	Improvement	Community involvement and education	Interest in education opportunities on the importance of green areas.	B - No revision recommended	Addressed broadly by HE Strategy 2.	N/A - not applicable
Healthy Ecosystems	HE 1, HE 2, HE 7	Improvement	Community involvement and education	Interest in integrating a citizen science component by expanding data inputs and public awareness of urban habitat.	C - Applicable to future implementation or other resource (eg. Different Plan)	Addressed broadly in HE Strategy 2.	N/A - not applicable
Healthy Ecosystems	N/A	Improvement	Other ecosystems	Interest in including wetlands, perennial grasslands, and oceans in the strategies.	C - Applicable to future implementation or other resource (eg. Different Plan)	All ecological communities will be addressed in the implementation of HE 1-5 and HE 3-1.	WS5, Konveio
Healthy Ecosystems	HE 2	Improvement	Stewardship jobs	Interest in the City allocating funding and creating ecosystem stewardship and gardening positions.	A - CAP revision recommended	Funding and Capacity Needs apply to entire CAP, and so are addressed appropriately more broadly.	WS4, Konveio, Email
Healthy Ecosystems	N/A	Improvement	Safe environment	Interest in conducting thorough testing, clean-ups, and remediation of all radioactive and hazardous waste contamination along and near waterfront areas.	C - Applicable to future implementation or other resource (eg. Different Plan)	See Hazards and Climate Resilience Plan (HCRP) https://s/planning.org/project/hazards-and-climate-resilience-plan	Email, Survey
Healthy Ecosystems	N/A	Improvement	Safe environment	Interest in addressing the issue of rising sea levels and groundwater threatening to flood radioactive and hazardous waste contamination sites in vulnerable and at-risk communities.	C - Applicable to future implementation or other resource (eg. Different Plan)	See Hazards and Climate Resilience Plan (HCRP) https://s/planning.org/project/hazards-and-climate-resilience-plan	Email, Survey
Healthy Ecosystems	All	Improvement	Resilience	Interest in creating resilient ecosystems in the face of natural disasters and sea level rise.	B - No revision recommended	Included in HE 3-2 AND 3-3. (*Note: this issue was finally mentioned on the very last page of Appendix A of the HCRP, and only re consequences. There were no strategies to address in the HCRP)	WS10, WS11
Healthy Ecosystems	HE 5, HE 6, HE 7	Improvement	Protect and expand green space	Interest in limiting population in the city and support for monitoring ecological management progress.	B - No revision recommended	Included generally in HE Strategy 3.	Konveio
Healthy Ecosystems	HE 5, HE 6, HE 7	Improvement	Protect and expand green space	Interest in protecting existing habitats from development.	B - No revision recommended	Included in HE 3-1.	Konveio
Healthy Ecosystems	HE 5, HE 6, HE 7	Improvement	Protect and expand green space	Interest in limiting outdoor lighting and controlling runoff.	C - Applicable to future implementation or other resource (eg. Different Plan)	Lighting should be addressed in ENERGY sector. Runoff is addressed by all the greening actions, though it does raise the point about a water chapter.	Konveio
Healthy Ecosystems	HE 8	Improvement	Agriculture on rooftops and backyards	Interest in having land use policy also support local, small scale agriculture on rooftops and in backyards.	C - Applicable to future implementation or other resource (eg. Different Plan)	Applies to Responsible Production and Consumption Chapter as this is about localization, and not so much carbon sequestration.	Konveio
Healthy Ecosystems	HE 2	Equity	Restoration efforts	Interest in empowering local communities, specifically native voices, to access green spaces and engaging them in land stewardship efforts and the City's decision making.	A - CAP revision recommended	Changes made to HE 2-1.	WS4, WS5, WS6, WS10, Konveio
Healthy Ecosystems	HE 2	Equity	Restoration efforts	Interest in focusing urban greening efforts on underserved areas while limiting gentrification (eg. finding balance between green spaces/affordable housing development).	B - No revision recommended	Racial equity is a primary goal of the CAP, and has been integrated into strategies and actions as appropriate through application of an racial equity scan.	WS4, WS5, WS6, WS10, Konveio
Healthy Ecosystems	HE 2	Equity	Restoration efforts	Interest in linking racial and social equity to health and green spaces.	B - No revision recommended	Same as above.	WS4, WS5, WS6, WS10, Konveio, Konveio
Healthy Ecosystems	HE 2	Equity	Job creation	Support for creating career pipelines for environment jobs by hiring within communities and ensuring every org has a DEI framework to address institutional inequities.	A - CAP revision recommended	Changes made to HE 2-1.	WS4, WS5, WS6, WS10, Konveio, Konveio
Healthy Ecosystems	All	Equity	Community involvement	Interest in engaging and following leadership from frontline and historically underserved communities.	A - CAP revision recommended	Changes made to HE 2-1 and 2-2.	WS5, Email
Healthy Ecosystems	All	Equity	Community involvement	Interest in City partnerships with local BIPOC organizations or low-income communities.	A - CAP revision recommended	Changes made to HE 2-1 and 2-2.	WS5, Email

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Healthy Ecosystems	HE 4	Equity	Funding	Support for redistribution/increase of funding to historically ignored areas to maintain healthy ecosystems	A - CAP revision recommended	Konveio
Healthy Ecosystems	HE7, HE8	Equity	Space limitation	Concern that some neighborhoods have more room for parks and open space than others. Thus, more urbanized neighborhoods will not have opportunities for added green spaces.	B - No revision recommended	WS11
Healthy Ecosystems	All	Equity	Explicitness	Interest in calling out equity explicitly in the strategies.	A - CAP revision recommended	WS5
Healthy Ecosystems		Other Considerations	Alignment of goals	Interest in aligning goals (especially housing goals) of City agencies and regulating industries (e.g., transportation, landscaping, construction).	C - Applicable to future implementation or other resource (eg. Different Plan)	WS2, WS3, WS5, Email
Healthy Ecosystems	HE 1, HE 2	Other Considerations	Alignment of goals	Interest in mandating cross-agency collaboration and strengthening and advancing City departments' existing policies, such as San Francisco's Biodiversity Resolution.	B - No revision recommended	WS2, WS3, WS5, Email
Healthy Ecosystems	N/A	Other Considerations	Density	Interest in getting rid of the Shadow Ordinance and building up, not out.	C - Applicable to future implementation or other resource (eg. Different Plan)	Konveio
Healthy Ecosystems	HE 4	Other Considerations	Terms	Confusion about what "built environment" means.	B - No revision recommended	WS11
Healthy Ecosystems	N/A	Other Considerations	Environmental health	Interest in addressing pollution-related public health emergencies in already-impacted Bayview Hunters Point and Treasure Island.	B - No revision recommended	Email
Healthy Ecosystems	HE 4	Underserved Communities/Minority Voices	Cost burden & incentives	Although eager to reduce emissions and make changes, hesitant of the accompanying costs to residents. Would like the City to provide financial support and incentives.	C - Applicable to future implementation or other resource (eg. Different Plan)	WS5, WS8
Healthy Ecosystems	HE 3	Underserved Communities/Minority Voices	Education to elderly	Interest in seeing an outreach and education plan that reaches the elderly populations.	B - No revision recommended	WS8, WS9
Healthy Ecosystems	All	Underserved Communities/Minority Voices	Unique community barriers	Interest in seeing tailored greening and restoration plans for different communities with unique barriers.	A - CAP revision recommended	WS9
Healthy Ecosystems	N/A	Underserved Communities/Minority Voices	Clean streets	Interest in seeing the City take action on cleaning and maintenance of existing streets and parks.	B - No revision recommended	WS9
Healthy Ecosystems	HE 7	Underserved Communities/Minority Voices	Conflict with housing need	Concern about space conflicts with the need for new housing.	B - No revision recommended	WS 5

GHG EMISSIONS MODELING: METHODOLOGIES AND ASSUMPTIONS

APPENDIX C

Appendix C-1: Sector-based and Consumption-based Emissions Inventories Overview

San Francisco has been tracking its emissions for more than two decades. As part of its commitment, emissions are tracked and reported to ensure progress.

HOW ARE EMISSIONS TRACKED?

Emissions inventories are essential tools for climate action planning and management. An emissions inventory estimates heat-trapping gases that are generated by specific activities for a specific time period. San Francisco tracks and collects activity data to calculate three main types of emissions for the city:

- Carbon dioxide
- Methane
- Nitrous oxide

Further, the city uses two types of emissions inventories to inform their climate action efforts. The annual sector-based inventory analyzes emissions that are produced within the geographical boundaries of San Francisco. This is the traditional means by which governments and other institutions have calculated their emissions. By contrast, the consumption-based emissions inventory (CBEI) evaluates emissions related to goods and service that are consumed within the city, regardless of where

they are produced. Due to its complexity, the CBEI inventory is performed about every five years. Both inventories, complement each other to provide a more complete account of the emissions generated by the city.

SECTOR-BASED EMISSIONS INVENTORY

San Francisco has been a leader in emissions inventories since 2008. Since then, the city has refined its datasets and data collection processes for both community-wide and municipal activities. An annual sector-based emissions inventory is used to measure San Francisco's local, geopolitically bound, emissions against the City's stated reduction goals.¹ SF Environment calculates and reports emissions on behalf of the City and County of San Francisco by using the Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories (GPC).² The GPC methodology is a global standardized framework used by most cities that report their emissions. The methodology is regularly updated with the best-available science and methods. Reported city emissions for 2010 were verified by a third-party in 2012³.

Process and Methodology

San Francisco's traditional inventory groups emissions into six sectors: transportation, building operations, landfilled organics, municipal (government) operations, wastewater, and agriculture.⁴

¹ Geopolitical refers to emissions occurring within the geographically boundary as well as certain emissions outside the city boundary. Cities typically account for their influence to reduce emissions out-of boundary such as from electricity and natural gas production and distribution, intraregional vehicle travel, and discards of organic waste to landfills.

² GPC is a global framework unifying the way cities inventory and disclose GHG emissions for reporting purposes to and in compliance with commitments to the Global Covenant of Mayors (GCoM). GPC Protocol at <https://ghgprotocol.org/greenhouse-gas-protocol-accounting-reporting-standard-cities>. The methodology and sectors

tracked were third party verified during inventory year 2012. Current GHG inventories are completed according to the guidance of verifiers in 2012.

³ [Updated Technical Review of the 2010 Community-wide GHG Inventory for City and County of San Francisco](#), ICF International, 2013.

⁴ Emissions from Landfilled Organics, previously known as the Waste sector, occur when disposed organics break down (decompose) in a landfill and produce methane.

2019 Sector-Based Emissions Inventory Findings

The 2019 sector-based emissions inventory showed that San Francisco emitted 4.64 million metric tons of carbon dioxide equivalent (mtCO₂e)⁵, which is 41% below emissions levels in 1990. These reductions came despite a 22% increase in population and a near tripling of economic output from \$59.7 billion in 1990 to \$178.5 billion in 2019. As a result, San Francisco's emissions per capita were 5.21 mtCO₂e/person in 2019, about half of the 11 mtCO₂e/person estimated in 1990.

The City releases detailed information and analysis on its inventory emissions, as well as the relevant policies and programs which help to reduce emissions, in the [San Francisco Carbon Footprint Website and Dashboard](#).

CONSUMPTION-BASED EMISSIONS INVENTORY (CBEI)

In addition to the sector-based emissions inventory, the city also uses a consumption-based emissions inventory (CBEI). A CBEI estimates emissions by analyzing the full life-cycle of all goods and services that are consumed in San Francisco. It includes measuring “upstream” emissions from the production, distribution and sale of products consumed in San Francisco, as well as “downstream” emissions from the eventual use and disposal of these products. Emissions are measured regardless of where different product stages took place or where emissions were released.

Since most of the goods and services consumed in San Francisco are produced outside of the City's boundaries in other states or countries, the CBEI is considerably larger (up to three times larger) than the conventional inventory. Most of San Francisco's consumption-based emissions (63%) are from the production phase of the global supply chain, highlighting the need to explore ways to reduce consumption and measure and account for the city's progress in reducing these emissions.

Process and Methodology

SF Environment collaborated with the UC Berkeley's Cool Climate Network to develop a CBEI for the City and County of San Francisco, California from 1990 to 2015. The study summed up the carbon footprints of all energy, transportation, food, goods, and services consumed by households and government agencies in San Francisco, regardless of where the emissions occurred. CBEIs consider full life cycle emissions, including resource extraction, production, transport, trade, use, and disposal; for most products, the majority of emissions are generated during production.

The calculations in the CBEI are based on estimates of consumer spending and corresponding emission factors for specific types of products. This view of emissions is intended to be an alternative to the traditional sector- or territorial-based inventories typically performed by cities, which count emissions from the city's physical boundaries and not beyond. Conducting an inventory through the lens of a CBEI presents opportunities to address global emissions from the life cycle of goods and services consumed within communities, regardless of whether emissions physically occur within the city's geographic boundaries.

Consumption-based inventories were developed less than 15 years ago and methods for calculating CBEIs are still evolving. The study used econometric analysis of national household survey data to uncover the main drivers of consumption for each product category (e.g., meat, furniture, vehicle usage), and then estimate consumption in San Francisco based on variation in these drivers compared to national averages. These main drivers include:

- demographics, including income, household size, race, and education
- home characteristics, such as home size, home ownership, structure type, and heating fuel
- travel behavior, including vehicle ownership, commute mode, and commute times
- geographic variables, such as population density, and weather

⁵ 2019 Sector Based GHG Emissions Inventory At-A-Glance report: https://sfenvironment.org/sites/default/files/fliers/files/2019_sfe_ee_climate_at_a_glance.pdf

- economic data, including energy prices

Based on this information, the CBEI estimated carbon footprints for every census tract in San Francisco, and for the city overall, from 1990 through 2015. Local data was included instead of modeled data wherever possible.

2015 Consumption-Based Emissions Inventory Findings

The CBEI found that average household carbon footprints in San Francisco decreased by 17% over the 25-year study period and were 21% lower than the

national average in 2015. Lower than average rates of motor vehicle usage, smaller home and household sizes, high prevalence of renters, population density, a moderate climate, and relatively low-carbon electricity all contributed to lower consumption-based emissions. These factors help to offset the countervailing effects of income and education, which tend to increase consumption and associated emissions. Despite progress at reducing emissions on a per household basis, in aggregate, the total city-wide CBEI was only 2% lower in 2015 compared to 1990 levels. This reality reflects population pressures and the challenge of reducing emissions that depend on global supply chains.

Appendix C-2: Modeling Building Operations Emissions

CLIMATE ACTION PLAN METHODOLOGY

Projections presented in the Climate Action Plan (CAP) are based on historic data, calculation methods applied in emissions inventories from 1990-present; the best available data sources (cited in Table C2); as well as the strategies and supporting actions proposed in the Plan.¹ The CAP builds in significant part upon lessons learned and tools piloted in the preparation of the [Focus 2030](#) report. Projections presented herein reflect the limitations of data available at the time of writing.

Models reflect our current understanding of how the San Francisco is expected to evolve in concert with relevant State and Federal policy advancements, and in the context of evolving international climate agreements. Further, public and private investment, as well as technology availability, capability and cost, will also change in ways that will support decarbonization. These developments are likely to accelerate emissions reduction, reduce costs, and provide other practical benefits, but the CAP conservatively focuses on impacts of the strategies proposed by and for San Francisco.

The CAP scenario summarizes the combined emission reductions from proposed strategies citywide. The majority of sector-based emissions are due to Energy Supply, Building Operations, and Transportation emissions, and modeling is focused on these sectors.

Transportation emission reductions were modeled by the San Francisco County Transportation Authority with assistance from their consultant, Cambridge Systematics (see **Appendix C-3 for the technical report**). Building Operations sectors were prepared by Department of the Environment staff with assistance from Arup.

ENERGY SUPPLY

Due to the development of renewable and low-emissions electric generation, emissions per unit of electricity supplied to San Francisco are declining rapidly. Historic emissions from the provision of electricity by PG&E, CleanPowerSF, SFPUC Hetch Hetchy Power, and Direct Access providers are documented in

past and current citywide emissions inventories. Baseline emissions per unit of electricity summarize the combination of all load-serving entities supplying electricity sources citywide as of 2018 using the Power Content Label methodology applied in the CAP and CA AB1110². Projected emissions are consistent with fulfilment of strategy ES 1, transition to 100% renewable electricity citywide by 2025.

Emissions per unit of fossil fuel consumed and emissions per unit of fuel from biogenic sources (such as renewable diesel, methane recovered from landfill and organic digestion) are consistent with published emissions inventory data.

BUILDING OPERATIONS MODEL

Projected emissions for operation of buildings were prepared utilizing a substantially enhanced version of the Climate Action for Urban Sustainability (CURB) Tool which was updated to reflect local conditions, data resources, and emissions inventories.^{3,4} Projected impacts to emissions reflect changes to the scale and energy efficiency of local building stock, mix of fuels utilized on-site, and electric grid emissions intensity. Baseline conditions were characterized, and the calculated emissions were calibrated to inventory actuals for the most recent published inventory at the time of modelling (2018). The tool projects annual emissions in horizon years 2030, 2040, and 2050, where annual emissions reflect the cumulative impact of CAP strategies. Annual emissions projected for all years other than the baseline and each horizon were calculated separately, via interpolation informed by the timing specified in the CAP for implementation of supporting actions. Projections for each horizon year are calculated at the building sector level: municipal, residential, and commercial.

The main inputs to changes in operational emissions from energy use can be summarized as:

- Fuel Switching: Changing the fuel required for an end-use changes Scope 1 direct emissions.

¹ Emissions from 1990 to the most recent year available, as well as sources and methods are presented in San Francisco's Climate Storyboard: sfenvironment.org/sf-climate-dashboard

² https://leginfo.legislature.ca.gov/faces/billCompareClient.xhtml?bill_id=201520160AB1110&showamends=false

³ World Bank (2016) *Climate Action for Urban Sustainability (CURB) Tool*, worldbank.org/en/topic/urbandevelopment/brief/the-curb-tool-climate-action-for-urban-sustainability.

⁴ See discussion of San Francisco GHG inventory methods in this section. For San Francisco GHG inventory reports as well as historic inputs and results, see: sfenvironment.org/carbonfootprint

For example, switching from a natural gas water heater to electric eliminates on-site emissions.

- **Efficiency:** Improving energy efficiency reduces fuel consumed on-site to serve an end-use (Scope 1 emissions) and reduces energy imported (Scope 2 emissions). This includes switching from an electric-resistance water heater to a heat pump water heater, which improves efficiency (units of energy required to deliver the same service).

Emissions reductions from strategies presented in the plan include estimation of the energy intensity for each major energy end-use, such as heating, cooling, fan energy, hot water, and lighting, within three building sectors: residential, municipal, and commercial. Commercial energy end uses are calculated by land use categorization: Office, Retail & Entertainment, Medical, Hotel, Production/Distribution/Repair, and Cultural/Educational. However, as noted above, Strategy ES-1 proposes transition from relatively clean electricity supplied citywide in recent years to exclusively emissions-free sources by 2025. As a result, results presented in this plan emphasize impacts to on-site fossil fuel combustion, or fuel switching.

Throughout the period modeled, the building stock is characterized by four states:

1. **Existing Buildings:** Building stock in San Francisco in the baseline year is defined as the set of existing buildings. Energy intensity and fuel saturation by end-use for existing buildings reflect the most recent available data by end-use for each category of building use and are conservatively assumed to remain constant until one of the following states applies:
2. **New Construction:** New construction is defined as buildings that are newly constructed and never previously occupied. New construction is required to meet efficiency and safety standards in effect at the time of construction. As of June 2021, new construction in San Francisco is required to be all-electric, so the CAP analysis shows new construction has no on-site fossil fuel combustion starting in 2021. Conservatively, energy intensity of new construction is assumed to remain constant, equivalent to present-day standards until 2050.

3. **Renovation:** Renovated buildings are defined as existing buildings where all energy systems throughout the building are all-electric. Renovated buildings are efficient, as they are required to comply with energy and safety codes in effect at the time of renovation.

Note that the term “efficient and all-electric” in this Plan refers to buildings and equipment with no fossil fuel use that meet current California Title 24 Energy Standards. So New Construction and Renovations are projected to be efficient and all-electric.

4. **Retrofit:** Retrofits are defined as upgrades that modify energy-related components of a portion of a building, where retrofitted components or systems eliminate on-site emissions. Retrofits reduce energy use and emissions, and improve efficiency because modifications must meet energy and safety codes in effect at the time of retrofit.
5. **Demolition:** For the CAP analysis, demolition is defined as the dismantling and removal of an entire existing building.

Key General Assumptions:

The rates of new construction, retrofit, renovation, and demolition for each sector and building use were informed by historic trends and published growth projections (see Table C1.1).

As buildings are retrofitted and renovated, the stock of existing buildings decreases in this model. To meet San Francisco’s goal of zero emissions by 2040, 100% of existing buildings must be renovated or replaced by 2040. For many reasons, including recent construction activity, retaining embodied carbon emissions in existing buildings, and policies that prioritize the preservation of historic resources, renovation is expected to remain more common than new construction.

- While modest voluntary activity is occurring, the CAP does not assume significant emissions reduction from redevelopment or retrofits until actions supporting electrification of existing buildings (BO-2) are phased-in. This is reflected as a notable reduction in natural gas emissions starting in 2025, which progresses over the next 15 years.

- Baseline electricity emissions are equivalent to 2018 and decline to near-zero by 2025.

Key Assumptions for Commercial Buildings:

Supporting action BO 2-6 would require decarbonization of larger commercial buildings by

2035. Emission reductions for large commercial building stock are adjusted to reflect the enhanced rate of activity established by this action. In the terms defined above, the retrofit and renovation of the largest existing commercial buildings will be greater than for other commercial stock.

Building Operations: GHG Impact Analysis Modeling Assumptions

Parameter	Unit	Assumption	Source	Link(s)
General				
Population	# of people	2016: 870,887 2030: 981,800	Resilient SF	
Gross Domestic Product (GDP)	\$/capita	2016: \$139,000,000,000 2030: \$185,941,011,638.77	San Francisco Office of the Controller	
Historical GHG Emission Trends	mtCO ₂ e	1990: 7,957,691 2010: 6,897,645 2012: 6,360,506 2016: 5,547,488 2017: 5,127,810	San Francisco's Communitywide Greenhouse Gas Inventory	https://data.sfgov.org/Energy-and-Environment/San-Francisco-Communitywide-Greenhouse-Gas-Invento/btm4-e4ak
Energy				
<i>Electricity grid mix</i>	%			
Wind		2016: 7.64%; 2030: 73.1%		
Large Hydro		2016: 31.72%; 2030: 24.80%		
Photovoltaic		2016: 9.72%; 2030: 2.2%		
Small Hydro		2016: 2.24%; 2030: 0%		
Geothermal		2016: 3.74%; 2030: 0%	San Francisco Public Utilities Commission	
Biomass		2016: 2.99%; 2030: 0%		
Nuclear		2016: 17.95%; 2030: 0%		
Natural Gas		2016: 13.52%; 2030: 0%		
Import/ others		2016: 10.47%; 2030: 0%		
Waste		2016: 0%; 2030: 0%		
Buildings				
Annual Growth New Buildings	% building growth per year			
Commercial		2018-2030: 0.8% ; 2030-2050: 0.5%	SF Planning	http://2040.planbayarea.org/cdn/future/u_7TKELkH2s3AAiOhCyh9Q9OIWEZldYcjzi2ODCZuls/1510696833/sites/default/files/2017-11/Final_Plan_Bay_Area_2040.pdf
Multifamily		2018-2030: 0.9% ; 2030-2050: 1.5%	SF Planning	
Single Family		2018-2030: -0.03% ; 2030-2050: -0.05%	SF Planning	
Redevelopment Rate	% redeveloped existing buildings per year		SF Environment. Redevelopment and retrofit rates are based on historic averages, equipment useful life, and market trends. Rates reflect the combination of: (a) Baseline to 2025: Conservative assumption of negligible electrification. (b) 2026	
Large Commercial (above 50k sq ft)		2016-2025: ~0%; 2025-2035: 5.8% ; 2035-2050: 5%		

Residential & Municipal & Small Commercial (below 50k sq ft)		2016-2025: ~0%; 2025-2040: 1.5%; 2040-2050: 5%	onward: Retrofits (partial electrification) and redevelopment (complete electrification) reflect implementation of actions in this plan. (c)	
Retrofit Rate	% retrofitted existing buildings per year	2016-2025: ~0%; 2025-2050: 3.5%	Projections for large commercial reflect separate actions supporting the elimination of on-site emissions from 90-100% of large commercial buildings by 2035.	
Square Footage	sq ft			
Commercial		235,613,069 sqft	OpenDataSF - Land Use, 2017	https://data.sfgov.org/Housing-and-Buildings/Land-Use/us3s-fp9q
Residential		522,763,520 sq ft		http://default.sfplanning.org/publications_reports/2016_HousingInventory.pdf
Percent of Large Commercial Building Stock (%)	% of building stock by sub-sector	Cultural & Educational: 55%	SF Planning Housing Stock Inventory (2016). Assumed MF units 1,000sqft and Single Family 1,875 sq ft.	
		Medical: 71%	A2030 and SFE analysis of Land Use (Assessor & Planning Data combined)	
		Office: 80%		
		Retail/Entertainment: 31%		
		Industrial: 42%		
		Hotel (Visitor): 85%		
Energy Use Intensities (EUI)				
Baseline EUIs	kWh/sq ft	Cultural & Educational: 17.27 Medical: 45.38 Office & Municipal: 22.34 Retail/Entertainment: 68.30 Industrial: 10.07 Hotel: 20.97 Single Family: 10.20 Multi Family: 10.42	Commercial: California End Use Survey (CEUS) pg. 187-189 Residential: San Francisco's 2016 GHG Inventory, Residential Appliance Saturation Survey (RASS)	https://www.energy.ca.gov/2006publications/CEC-400-2006-005/CEC-400-2006-005.PDF https://data.sfgov.org/Energy-and-Environment/San-Francisco-Communitywide-Greenhouse-Gas-Invento/btm4-e4ak https://www.energy.ca.gov/appliances/rass/previous_rass.html

New Construction/Redevelopment EUIs	kWh/sqft	Cultural & Educational: 10.18 Medical: 21.77 Office & Municipal: 14.72 Retail/Entertainment: 41.13 Industrial: 8.78 Hotel: 11.33 Single Family: 3.89 Multi Family: 3.93 <i>Please refer to "Source"</i>	Commercial: California End Use Survey (CEUS) pg. 187-189 Residential: San Francisco's 2016 GHG Inventory, Residential Appliance Saturation Survey (RASS)	https://www.energy.ca.gov//2006publications/CEC-400-2006-005/CEC-400-2006-005.PDF https://data.sfgov.org/Energy-and-Environment/San-Francisco-Communitywide-Greenhouse-Gas-Invento/btm4-e4ak https://www.energy.ca.gov/appliances/rass/previous_rass.html
Building Fuel Ratios				
Electricity Emissions Factor (BAU)		0.0000962 (mTCO ₂ e/kWh)	PG&E 2017 Electricity Emissions Factor	

APPENDIX C-3

Climate Action Plan Transportation and Land Use – Climate Change Mitigation Analysis

October 22, 2021

prepared for

San Francisco County Transportation Authority

prepared by

Cambridge Systematics, Inc., San Francisco County Transportation Authority

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1.0 Introduction

This climate change mitigation analysis was prepared for the Climate Action Plan's Transportation and Land Use (CAP TLU), in collaboration with San Francisco County Transportation Authority (SFCTA), San Francisco Department of the Environment (SFE), San Francisco Municipal Transportation Agency (SFMTA) and the Planning Department. This analysis identifies the potential greenhouse gas (GHG) reduction benefits for each strategy in the chapter and, where possible, strategy adjustments to maximize overall potential GHG benefit. Based on a review of existing GHG analysis practices, best practices were applied for analyzing potential GHG reductions for each of the strategies listed below. This analysis does not evaluate the impact of individual actions. The Transportation and Land Use Strategies are:

1. Transit: With community input, build a fast and reliable transit system that is accessible to all and will be travelers' preferred way to get around.
2. Active Transportation and Transportation Demand Management (TDM): Create a complete and connected active transportation network that shift trips from driving to walking, biking, and other low-carbon modes
3. Equitable Pricing: Use equitable pricing levers to manage congestion and carbon emissions, while reinvesting revenues to further improve the multimodal transportation network.
4. Parking: Use San Francisco's parking resources more efficiently.
5. Development: Promote job growth, housing, and other development along transit corridors.
6. Land Use: Increase density, diversity of land uses, and location efficiency across San Francisco.
7. Zero-Emission Vehicles: Accelerate the adoption of zero-emissions vehicles (ZEVs) and other electric mobility options.

The assessment begins with a baseline inventory and forecast to estimate surface transportation GHG emissions for 2015 (on-road motor vehicles and rail transit) and projected emissions in 2030 and 2050. It continues with an evaluation of the CAP TLU strategies for reductions in 2030 and 2050 compared to the forecast baseline and to 2015 and 1990 levels. Emissions in 1990, set as the city and county's baseline for the future GHG reduction goals, were estimated separately in the SFE's 2012 Communitywide Greenhouse Gas Emissions Inventory. The CAP TLU goal is to achieve 1990 surface transportation emissions through the chapter's strategies.

2.0 Baseline Inventory and Forecast

2.1 Inventory Scope

The baseline inventory includes the following surface transportation modes: light duty vehicles (passenger cars, vans, sport utility vehicles, and light trucks); medium duty trucks, heavy duty trucks, buses, and rail transit. It excludes air (passenger and freight aircraft using San Francisco International Airport), and water transport (ferries, cruise, and cargo ships). It also excludes “off-road” sources such as ground support equipment at the airport or port and warehouse equipment such as cranes and forklifts.

The baseline inventory and forecast includes GHG emissions associated with vehicle miles traveled (VMT) that occur within San Francisco’s city limits. For transit agencies that provide regional service such as BART, Caltrain, and bus operators from neighboring counties, emissions are assigned based on the estimated proportion of the transit system’s operations occurring within the city’s boundaries.

The inventory is based on a bottom-up estimation of the number of vehicles and miles driven by type of vehicle, as well as fuel efficiency and the mix of fuel types for each type of vehicle. Total vehicle population, activity, and emissions are presented by transportation subsector. GHG emissions estimates are based on fuel consumption by type of fuel, with varying consumption rates and fuel type splits by activity subsector and technology/fuel type. The activity subsectors used in the inventory are shown in Table 1. The technology/fuel types include gasoline and diesel internal combustion engine (ICE), compressed natural gas (CNG), and electricity.

The transportation sector inventory in this study presents two GHG emissions estimates: a “tailpipe” estimate, which calculates only direct vehicle emissions, as well as a “lifecycle” estimate, which includes emissions from electric power generation for electric vehicles and the upstream emissions associated with the production and transportation of conventional fuels.

Table 1: Transportation Activity Subsectors in Baseline Inventory and Forecast

Key	Subsector
1	Light-Duty Vehicles
2	Medium and Heavy-Duty Vehicles
2.1	Medium-Duty/Single-Unit Trucks
2.2	Heavy-Duty/Combination Trucks
2.3	Buses
3	Rail
3.1	SF Muni Light Rail & Streetcar
3.2	Heavy Rail (BART)
3.3	Commuter Rail

2.2 Data Sources and Methodology

The GHG baseline inventory and forecast relies on five key data pieces, collected by mode: vehicle population, vehicle miles traveled (within city limits), vehicle fuel efficiency, carbon intensity of fuels, and vehicle technology fraction (share of vehicles by fuel type).

Vehicle Population

On-road vehicle populations were sourced from the EMFAC¹ model for the year 2015 by mode (light duty, medium duty, heavy duty, buses). Estimates of vehicle populations were extrapolated out to 2050 based on VMT projections from model runs conducted by SFMTA for the ConnectSF study using the agency's travel demand model, known as SF-CHAMP. It was assumed that the number of miles driven vehicle remains constant in the future.

For rail lines that service San Francisco², vehicle populations were sourced from the National Transit Database³, and a fraction of the operator's vehicle population was apportioned to San Francisco based on the proportion of route-miles within the city based on General Transit Feed Specification (GTFS) data.

Vehicle Miles Traveled

For cars and trucks, daily VMT for 2015 and 2050 was sourced from ConnectSF modeling output⁴ and calibrated to annual VMT based on totals reported in the 2012 San Francisco Community-Wide GHG Inventory. VMT totals were then apportioned by mode based on percentages acquired from the EMFAC model.⁵ For public transit buses, VMT (revenue-miles) was sourced from the National Transit Database, and a fraction of the operator's revenue-miles was apportioned to San Francisco based on the proportion of route-miles within the city based on GTFS data. Transit bus VMT was then projected out to 2050 according to growth rate projections sourced from ConnectSF.

Fuel Efficiency

Estimates of fuel efficiency (in miles per gallon gasoline equivalent) for each vehicle type and fuel technology across the study period were taken from the U.S. Department of Energy, Annual Energy Outlook (AEO) 2018 Reference Case.⁶

¹ California Air Resources Board. EMFAC2017 v1.0.2 Fleet Database. <https://arb.ca.gov/emfac/fleet-db>

² SFMTA, BART, Caltrain, San Mateo County Transit District, Golden Gate Bridge, Highway, and Transportation District, and Alameda-Contra Costa Transit District were all identified as rail services operating in SF municipal boundaries.

³ Federal Transit Administration. National Transit Database. 2015 NTD Transit Agencies Profiles. <https://www.transit.dot.gov/ntd/transit-agency-profiles>

⁴ Provided by SFCTA.

⁵ California Air Resources Board. EMFAC2017 v1.0.2 Emissions Inventory. <https://arb.ca.gov/emfac/emissions-inventory>

⁶ US Energy Information Administration. Annual Energy Outlook 2018. <https://www.eia.gov/outlooks/archive/aeo18/>

Carbon Intensity of Fuels

An electricity grid emissions factor was calculated for 2015 based on the electric grid mix for the San Francisco Public Utilities Commission, as outlined in the Appendix of the San Francisco Focus 2030 report.⁷ The electricity grid emissions factor was set to be zero for 2030 and beyond, per stated city goals, and was linearly interpolated between 2015 and 2030.

Gasoline, diesel, and CNG carbon intensity was based on Energy Information Administration data on CO₂ per gallon⁸ and includes an additional 2 percent for non-CO₂ emissions. Fuel carbon intensities for the lifecycle analysis were sourced from data obtained from the California Low Carbon Fuel Standard.⁹

Vehicle Technology Fraction

For light duty vehicles, baseline vehicle technology estimates were sourced from the California Energy Commission Vehicle Population Dashboard for 2015 to 2020.¹⁰ Between 2020 and 2030, zero-emission vehicle (ZEV) shares were projected based on a CEC “mid-range” analysis.¹¹ ZEV shares were then extrapolated to 2050 based on “mid-range” projections from the National Renewable Energy Laboratory 2017 Electrification Futures Study.¹² Vehicle technology splits within “non-ZEV” fuels were kept constant throughout the projection. A fraction of the ZEVs were assumed to be plug-in hybrids (only partial ZEVs, not full ZEVs); based on AEO technology assumptions; plug-in hybrids make up about 25 percent of ZEV travel in 2030 but only 3 percent in 2050 reflecting the anticipated long-term dominance of full battery-electric technology.

For medium and heavy duty vehicles, baseline fuel technology splits were sourced from EMFAC data. ZEV technology adoption and population shares were then forecasted based on the recently approved Advanced Clean Trucks Regulation.¹³ Vehicle technology splits within “non-ZEV” fuels were kept constant throughout the projection.

Baseline rail fuel technology information was sourced from National Transit Database reporting. No technology changes are assumed for light rail and heavy rail modes.

⁷ San Francisco Department of the Environment. Focus 2030 Report. <https://sfenvironment.org/download/focus-2030-a-pathway-to-net-zero-emissions-climate-report-july-2019>

⁸ Energy Information Administration. Carbon Dioxide Emissions Coefficients. https://www.eia.gov/environment/emissions/co2_vol_mass.php

⁹ California Air Resources Board. Low Carbon Fuel Standard. <https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard>

¹⁰ California Energy Commission. Vehicle Population in California. <https://www.energy.ca.gov/data-reports>

¹¹ SF Environment staff recommended usage of the mid-range forecast per email correspondence on January 12, 2021. Source: California Energy Commission. Light-Duty Vehicle Forecast 2020 IEPR Update. <https://www.energy.ca.gov/event/workshop/2020-12/session-1-transportation-energy-demand-forecast-update-commissioner-workshop>

¹² National Renewable Energy Laboratory. Electrification Futures Study. 2017. <https://www.nrel.gov/docs/fy21osti/72330.pdf>

¹³ California Air Resources Board. Advanced Clean Trucks. <https://ww2.arb.ca.gov/our-work/programs/advanced-clean-trucks>; ZEV Population estimates from ACT rule obtained through Mobile Source Strategy 2020 supporting documents: <https://ww2.arb.ca.gov/resources/documents/2020-mobile-source-strategy>

2.3 Greenhouse Gas Estimates

Table 2 displays the baseline “tailpipe” GHG emissions estimates from 1990 through 2050, with emission estimates for 2015 through 2050 broken out by mode. Notably, the 1990 estimate is presented only as a total since it was sourced externally from the San Francisco Environment Community-Wide Greenhouse Gas Inventory.¹⁴ The 2015 estimate from the San Francisco Environment GHG Inventory is also presented to allow for a direct comparison between the two estimates. While the San Francisco Environment inventory estimates 2015 emissions to be about four percent higher than the current analysis, VMT totals for this analysis are calibrated to match those in the San Francisco Environment inventory in order to ensure comparability. The difference in 2015 emissions estimates for the SF Environment Inventory and the current analysis is likely due to minor differences in underlying assumptions regarding vehicle fuel efficiency, emissions factors, and the distribution of VMT among the different vehicle classes.

In 2015, GHG emissions resulting from travel occurring within city limits reached nearly two million metric tons. Around three-quarters of the city’s GHG emissions come from passenger vehicles. While VMT is forecast to increase by 21 percent from 2015 to 2050 (see Section 4.2), GHG emissions are expected to fall 24 percent by 2030 and 58 percent by 2050, mostly because of continued fleet electrification coupled with improvements in fuel economy.

Table 2: Baseline Tailpipe Greenhouse Gas Emissions (MT CO₂e)

	1990	2015	2015	2030	2050
Subsector	SF Environment Inventory		Current Analysis		
Light Duty Vehicles			1,458,758	1,038,425	475,940
Medium-Duty Trucks			111,416	105,393	81,044
Heavy-Duty Trucks			190,008	207,689	184,333
Buses			155,064	108,495	60,005
Rail			1,867	974	912
Total	2,195,670	2,032,993	1,917,113	1,460,975	802,234

Table 3 displays the lifecycle GHG emissions across the study period. As noted in section 2.1, the lifecycle emissions estimates include emissions from electricity generation used to power electric modes of transportation, as well as upstream energy use associated with conventional fuels. In 1990 and 2015, lifecycle emissions are roughly 42 percent higher than tailpipe emissions, whereas lifecycle emissions are about 33 percent higher than tailpipe emissions in 2030 and 2050.¹⁵ The narrowing gap between lifecycle

¹⁴ San Francisco Department of the Environment. San Francisco Community-Wide Greenhouse Gas Inventory. <https://sfenvironment.org/climate-change/downloads>

¹⁵ Lifecycle emission multipliers were sourced by comparing standard fuel emission rates for gas and diesel from the Energy Information Administration with the life cycle fuel emission factors as laid out by the California Low Carbon Fuel Standard.

and tailpipe emissions is attributable to improvements under the California Low Carbon Fuel Standard, as well as the San Francisco plan for 100 percent renewable electricity by 2030.

Table 3: Baseline Lifecycle Greenhouse Gas Emissions (MT CO₂e)

	1990	2015	2015	2030	2050
Subsector	SF Environment Inventory		Current Analysis		
Light Duty Vehicles			2,081,089	1,390,220	636,869
Medium-Duty Trucks			158,408	141,224	108,568
Heavy-Duty Trucks			261,854	273,372	242,588
Buses			213,210	142,830	78,995
Rail			14,344	1,282	1,200
Total			3,125,416^a	2,893,853	2,728,906

^a The 1990 "tailpipe" estimate was sourced from the San Francisco Environmental GHG Inventory and no fuel breakdown was provided in this inventory; thus, it is assumed that the fuel splits are equal to 2015 for the purposes of a lifecycle estimate.

3.0 Estimation of CAP TLU Strategies

3.1 Modeling Approach

In order to model the impacts of the various CAP TLU strategies, a “sketch” model was implemented in Microsoft Excel. The model incorporates general relationships between strategies and travel and emissions to allow for ranges of potential impacts to be examined. For example, if a bike lane is added, the tool will assume a default average of new bicycle trips (and reduced auto trips) per mile. The sketch model is set up to accept inputs and produce outputs for years 2030 and 2050. Outputs include total VMT, total GHG emissions, and total fuel use by type of fuel.

3.2 Modeling Approach and Impacts by Strategy Area

3.2.1 Clean Vehicles

The “Clean Vehicles” strategy models the adoption of the ZEV adoption targets as outlined in the CARB 2020 Mobile Source Strategy.¹⁶ The strategy document sets out ZEV targets for light duty, medium duty, and heavy duty vehicles to help meet the state’s newly adopted climate goals.¹⁷ Table 4 outlines the target ZEV population share for each class of vehicles according to the supporting MSS documentation. In addition to market penetration assumptions, the evaluation of clean vehicles relies on assumptions about fuel efficiency and carbon content of fuels as described for the baseline forecast. It is assumed that this strategy will mainly be achieved as a result of state policies, although city actions such as expanded home, workplace, and public charging infrastructure will play an important supporting role.

Table 4: 2020 Mobile Source Strategy Forecast ZEV Share by Mode

Vehicle Class	2030 ZEV Share	2050 ZEV Share
Light Duty Vehicles	25%	100%
Medium Duty Vehicles	5%	50%
Heavy Duty Vehicles	8%	50%

The “Clean Vehicles” strategy also reflects a degree of “induced demand” resulting from increased electrification. Since the per-mile cost of driving is lower under electric vehicles than conventional gas-powered vehicles, it is expected that individuals will drive electric vehicles more. As a result, this analysis

¹⁶ California Air Resources Board. 2020 Mobile Source Strategy. <https://ww2.arb.ca.gov/resources/documents/2020-mobile-source-strategy>

¹⁷ State of California. Executive Department. Executive Order B-55-18 To Achieve Carbon Neutrality. <https://www.ca.gov/archive/gov39/wp-content/uploads/2018/09/9.10.18-Executive-Order.pdf>

assumed a 6 percent¹⁸ increase in the VMT of electric vehicles. One consideration in applying pricing policies (Section 3.2.6) might be to offset the incremental reduction in cost per mile of travel for electric vehicles.

3.2.2 Transit

Policies under the “transit” strategy were modeled using the SF-CHAMP travel demand model as part of the ConnectSF study, which included transit operational improvements (such as transit priority lanes), and local and regional transit projects identified in ConnectSF. The aggregate VMT reduction of these projects were then allocated to VMT by vehicle type and technology to estimate GHG reduction.

Table 5: Transit Strategy Data Assumptions and Methodology

Data Point	Value	Methodology	Source
ConnectSF Transit Projects			
VMT Reduction (million miles)	2030: 56.5	Auto VMT reductions provided directly from ConnectSF modeling output for the year 2050, and linearly interpolated to obtain estimate for 2030. Includes Muni Forward transit priority improvements + 110 miles of transit lanes by 2050.	ConnectSF modeling ¹⁹
	2050: 131.9		

3.2.3 Housing and Land Use

Land use policies that promote compact development around transit corridors have the ability to lower greenhouse emissions through reduced regional VMT. Examples of policies referenced in the CAP include increasing heights, removing density restrictions, and streamlining approval processes to promote housing and job growth along transit corridors; allowing multi-family housing throughout the city and increasing the mixing of home-based business and residential uses; and facilitating the development of neighborhoods where people live within an easy walk or roll of their daily needs. This analysis combines CAP strategy 5 (Development) with CAP strategy 6 (Land Use) since both relate to achieving more transportation-efficient land use patterns.

The effects of these types of policies were estimated through a generalized model in the Excel tool. This model considers how total VMT might change if new residents drive at the same rate as current residents of San Francisco’s most travel-efficient (lowest VMT per capita) neighborhoods. In order to model the effects of compact housing and transit corridors, the follow process was employed:

¹⁸ This estimate was derived based on the fuel cost per-mile of electric versus gasoline vehicles, and the elasticity of VMT with respect to fuel cost as discussed in Section 3.2.6.

¹⁹ ConnectSF modeling output and VMT reductions were obtained from SFCTA.

1. Block group-level population estimates for 2017 were downloaded from the U.S. Census American Community Survey,²⁰ and 2017 VMT per capita estimates at the block group level were sourced from the Caltrans Smart Mobility Calculator,²¹ These estimates were then aggregated to the neighborhood level.
2. Neighborhoods were then categorized into tertiles based on VMT per capita – with each neighborhood being classified as “low,” “medium,” or “high” VMT per capita. “Low VMT” neighborhoods had less than 8 daily VMT per capita, “medium VMT” neighborhoods had between 8 and 10 daily VMT per capita, and “high VMT” neighborhoods had greater than 10 daily VMT per capita.
3. Population data for 2050 was taken at the neighborhood level from ConnectSF²² to calculate the expected population growth in each area. Under a “business-as-usual” scenario, VMT by neighborhood was calculated in 2050 assuming that VMT per capita in each neighborhood remained constant..
4. To estimate the effects of housing and land use policies that promote more compact, transit-oriented development, a scenario was modeled where new population growth between 2015 and 2050 was “redirected” from neighborhoods with higher VMT per capita to neighborhoods with lower VMT per capita.
5. The following assumptions were used to estimate VMT changes from a holistic housing and land use strategy:
 - By 2050, 50 percent of the population growth in “medium VMT” neighborhoods is redirected into “low VMT” neighborhoods.
 - By 2050, 60 percent of the population growth in “high VMT” neighborhoods is redirected equally into “medium VMT” and “low VMT” neighborhoods (30 percent each).

This method simulates shifting future growth into lower VMT areas within San Francisco, resulting in an incremental reduction in VMT and GHG from future baseline conditions. This method does not represent key intended aspects of land use policy such as reducing VMT of existing households through increasing neighborhood density and mixed use, and, most notably, the effect of local and regional land use policy on redirecting growth from more suburban and exurban high-VMT places around the region to low-VMT places like San Francisco. When considered at the broader regional scale, the GHG and VMT reduction benefits of these land use strategies within San Francisco could be greater than the San Francisco-only focused analysis within the Climate Action Plan.

In the absence of additional policies to direct more growth into low-VMT neighborhoods (i.e., above and beyond conditions assumed in the city’s baseline forecasts), the population of “low VMT” neighborhoods is expected to grow by 37 percent between 2015 and 2050 (~134,000 additional residents). With additional growth-directing policy measures, the population of “low VMT” neighborhoods would increase by 61 percent (roughly ~221,000 additional residents) based on the growth shift assumptions stated above. Correspondingly, in the absence of additional policies, “high VMT” neighborhoods are expected to see

²⁰ US Census Bureau. 2013-2017 ACS 5-Year Estimates. <https://www.census.gov/programs-surveys/acs/technical-documentation/table-and-geography-changes/2017/5-year.html>

²¹ Caltrans Smart Mobility Calculator: A Transportation, Housing, Climate Action Coordination Tool. <https://smartmobilitycalculator.netlify.app>

²² San Francisco County Transportation Authority. ConnectSF Population and Jobs. <https://connectsf-populationandjobs.sfcta.org/>

population increases of 38 percent (~136,000 additional residents). However, with additional policy measures, “high VMT” neighborhood populations would only increase by roughly 15 percent (~54,000 additional residents). Taken together, the illustrative growth shift associated with additional land use policies is estimated to reduce VMT by around 153 million miles annually by 2050.

3.2.4 Active Transportation and Travel Demand Management

The following set of policies were modeled as part of the “active transportation and TDM” strategy: new bike lanes as noted in the CAP; electric bike (e-bike) subsidies, representing other actions to make biking more accessible; Complete Streets policies to encourage more walking, biking, and transit use through street design; and employer TDM benefits. (Examples of employer TDM benefits include transit subsidies or pre-tax benefits, vanpool and rideshare programs, telework policies, and incentive/rewards programs for reducing solo vehicle trips.) Bike lanes and Complete Streets were modeled using estimates of new bikers or walkers per mile of new facility, and per dollar of subsidy for e-bikes, as developed in other studies; along with assumptions about what fraction of new bikers or walkers would have driven instead. TDM benefits were based on estimated changes in market shares of workers reached by TDM programs and the VMT reduction per affected worker as identified from evaluation studies and modeling experience from other projects.

Table 6: Active Transportation/TDM Strategy Data Assumptions and Methodology

Data Point	Value	Methodology	Source
New Bike Lanes			
Miles of Lanes	2030: 60	Assumption	CAP Action List
	2050: 120		
New bike miles traveled per facility mile (annual)	114,844	This estimate was developed by the project team for the Transportation and Climate Initiative (TCI) Investment Strategy Tool based on data from various sources	Transportation and Climate Initiative Tool Documentation ²³
Prior drive mode share	2030: 38%	Percent of trips to/from/within San Francisco that were “drive alone” or “shared ride” ^{Error! Bookmark not defined.}	SF-CHAMP
	2050: 36%		
E-bike Subsidies			
Annual Subsidy Amount	\$223,800	Goal of offering a \$1,250 subsidy for e-bike purchase to 5% of low income households in San Francisco. Total program cost annualized between 2022 and 2050.	Total low income households sourced from SF-CHAMP. E-bike

²³ Transportation and Climate Initiative - 2019/2020 TCI Investment Strategy Tool Documentation. Prepared for Georgetown Climate Center by Cambridge Systematics, Inc., September 2020. <https://www.transportationandclimate.org/modeling-methods-and-results>

Data Point	Value	Methodology	Source
			subsidy of \$1,250 in line with previous SFMTA Proposal. ²⁴
Change in auto VMT per \$ subsidy (miles)	-1.2	Estimate developed through TCI tool (assumes e-bike subsidy of \$1,250 with a 6-year lifespan, 6 trips per week, and a trip length of 2.5 miles).	TCI (<i>ibid</i>) and ITF (2020) ²⁵ for lifespan and trips per week; trip length from SF-CHAMP (average for trips starting and ending within San Francisco).
Complete Streets			
Miles of Complete Streets	50	Assumption	CAP Action
Change in annual auto VMT per mile of new Complete Street	50,999	Estimate developed through TCI tool (for core urban neighborhoods)	TCI (<i>ibid</i>)
Employer TDM Benefits			
Total Daily Work Trips in San Francisco	2030: 1.60 M 2050: 1.86 M	Estimate sourced from SFCHAMP. Estimate for 2030 was linearly interpolated from the 2015 and 2050 estimates.	SF-CHAMP
Average Work Trip Length (miles)	2030: 6.8 2050: 6.5	Estimate derived from SF-CHAMP modeling; includes only the distance within San Francisco of all work trips with work destination in the city.	SF-CHAMP ²⁶
Change in drive-alone mode share w/ TDM program	-5%	Estimate of TDM program efficacy based on various evaluation studies. Represents the average mode shift for all workers at affected worksites.	Project Team based on various sources ²⁷

²⁴ SFCTA - Transportation Fund for Clean Air Project Information Forms For July 2020 Board Approval. https://www.sfcta.org/sites/default/files/2020-07/SFCTA_Board_TFCA20-21ProgramRecommendationENCLOSURE_2020-07-28.pdf

²⁵ International Transport Forum (ITF). (2020). "Good to Go? Assessing the Environmental Performance of New Mobility."

²⁶ SF-CHAMP modeling output provided by SFCTA.

²⁷ For example, the Washington State Commute Trip Reduction Ordinance was found to increase non-drive-alone trip rates from 34.3 to 39.1 percent (a 4.8 percentage point increase), averaged across over 1,000 affected worksites. See: Washington State Commute Trip Reduction Board, 2017 Report to the Legislature. Illustrative runs of the TRIMMS model (<https://mobilitylab.org/calculators/download-trimms-4-0/>) have also shown impacts per worksite on the order of a 5 percent vehicle trip or mode share reduction.

Data Point	Value	Methodology	Source
Additional % of workforce receiving TDM benefits	50%	Assumption.	Project Team

3.2.5 Parking Pricing

The pricing strategy represents expanding per-hour pricing for on-street parking in all locations and during all times of day. The model represents pricing by segmenting driving tours into those that parked on-street without payment and all others, and by the total direct cost of travel from bridge tolls and value tolls. For each segment, the total number of tours, vehicle trips, San Francisco VMT²⁸, average on-street parking duration, and percent of total San Francisco VMT in each segment. Then an elasticity is applied to the unpaid on-street parking tours relative to the direct cost before parking pricing. The elasticity was estimated from SF-CHAMP modeling for Congestion Pricing. Because elasticities cannot be used when the starting price is \$0, the same modeling was used to estimate a percent change in demand from \$0 to the new hourly rate. Table 7: Parking Pricing Strategy Assumptions and Methodology presents the assumptions used in the parking pricing strategy.

Table 7: Parking Pricing Strategy Assumptions and Methodology

Data Point	Value	Methodology	Source
Elasticity of trips with respect to price	-0.10 ²⁹	Developed from modeling output of the Downtown Congestion Pricing Study.	SF-CHAMP
Share of trips parking on-street for free, segmented by total trip cost	Various, 18% total	Estimated from travel survey data	MTC-SFCTA 2018-2019 Travel Survey
Average parking duration for free on-street parking, segmented by total trip cost (hours)	Various, 3.36 average	Estimated from travel survey data	MTC-SFCTA 2018-2019 Travel Survey
On-street parking cost	\$5.00 per hour	Twice the daily average 2019 parking meter rate	SFMTA ³⁰

²⁸ San Francisco VMT includes all VMT for trips with both trip ends in San Francisco, and half of the VMT for trips with one trip end in San Francisco and the other outside San Francisco.

²⁹ SF-CHAMP Congestion Pricing Model Runs, 2015 Base, 2015 inbound \$6 charge, 2015 inbound \$8 charge.

³⁰ SFMTA Citywide Meter Rate Adjustment, November 2019. https://www.sfmta.com/sites/default/files/reports-and-documents/2021/01/rate_change_2019_nov.csv

3.2.6 Road Pricing

Policies evaluated under the road pricing strategy fell into two main categories: congestion pricing, and mileage-based pricing. The mileage-based pricing strategy modeled in this assessment is based on the 2017 California Road Charge Pilot Program, which could be applied at the state level as a long-term supplement or replacement to the motor fuel tax. Mileage-based pricing was modeled using published fuel price elasticities. Congestion pricing was modeled using the SF CHAMP travel demand model. Table 8 outlines the key data methodologies and sources used in modeling the pricing strategy. The baseline cost per VMT was estimated based on fuel price and vehicle efficiency (miles per gallon) assumptions as noted elsewhere in this analysis.

Table 8: Pricing Strategy Assumptions and Methodology

Data Point	Value	Methodology	Source
Congestion Pricing			
VMT Reduction (daily)	-3.5%	Estimated from CHAMP modeling output of the Downtown Congestion Pricing Study.	SF-CHAMP
VMT Fee			
Added cost per VMT	\$0.02 per mile	Consistent with proposals for a California road charge to make up for lost fuel tax revenue.	CalSTA ³¹
Added cost per Gasoline-powered VMT	\$0.10 per mile	Assumption	SFCTA
Elasticity of VMT with respect to price	-0.12 ³²	This number reflects estimates in the literature for the percent change in VMT based on the percent change in fuel price	Small and van Dender (2007) ³³

³¹ California State Transportation Agency (2017). California Road Charge Pilot Program.

³² This estimate from the literature implies that a 10 percent increase in fuel price results in a 1.2 percent decrease in VMT. This elasticity estimate is applied to the increase in *trip price*, based on the fuel costs of a trip. As such, these estimate is highly sensitive and subject to uncertainty.

³³ Small, Kenneth and Kurt Van Dender (2007), "Fuel Efficiency and Motor Vehicle Travel: The Declining Rebound Effect," *Energy Journal*, Vol. 28, No. 1, pp. 25-51

4.0 Strategy Impacts

4.1 Greenhouse Gas Emissions

The combination of CAP TLU strategies, labeled as the CAP TLU Scenario, is estimated to result in a 23 percent decrease in greenhouse gas emissions by 2030 compared to the 2030 baseline scenario, and a 69 percent decrease in 2050 compared to the 2050 baseline scenario. Compared to 1990 baseline emissions, the CAP TLU Scenario is estimated to reduce greenhouse gas emissions by about 49 percent by 2030 and 88.7 percent by 2050. Table 9 shows the calculated change in total metric tons as well as percentage changes. Negative values represent reductions in emissions.

Table 9: GHG Emissions and Changes from CAP TLU Scenario

	1990	2015	2030	2050
Baseline (MT CO₂e)	2,195,670	1,917,113	1,489,844	820,255
CAP TLU Scenario (MT CO₂e)			1,107,274	211,087
CAP TLU Scenario Change from 2030/2050 Baseline			(382,570)	(609,168)
CAP TLU Scenario Change from 2030/2050 Baseline			-25.7%	-74.3%
CAP TLU Scenario Change from 1990 Baseline			(1,088,396)	(1,984,583)
CAP TLU Scenario Change from 1990 Baseline			-49.6%	-90.4%

Achieving significant GHG reductions beyond the levels shown here will require even more aggressive and complete electrification of the light duty vehicle fleet, as well as a transition of medium and heavy trucks to low- or zero-carbon fuels. Given that trucks travel across jurisdictional boundaries even more than light-duty vehicles, substantially reducing emissions from this subsector will require significant involvement by the State of California and cooperation among jurisdictions within the Bay Area. Additional measures to reduce VMT can also help, but will have diminishing returns as emissions per mile traveled decrease.

Table 10 details the greenhouse gas impacts at the strategy level to show the effects of each individual strategy compared to each year's respective baseline total. For example, the "Clean Vehicles" strategy is estimated to reduce GHG emissions by about 15 percent compared to the 2030 baseline scenario, and by 65 percent compared to the 2050 baseline scenario. Notably, the "combined reduction" estimate does not equal the exact summation of the individual strategy reductions. When all strategies are implemented simultaneously, each strategy's individual effectiveness is impacted by the reductions of the other strategies. For example, the greenhouse gas reduction benefits of the "Active Transportation/TDM" strategy will be lower if more of the vehicle fleet is electrified as a result of the "Clean Vehicles" strategy. Alternatively, the

greenhouse gas reduction benefits of the “Clean Vehicles” strategy will be lower if fewer people are driving due to active transportation measures.

Table 10: GHG Change from Individual Strategies

Strategy Focus Area	2030		2050	
	Change from Baseline (MT CO ₂ e)		Change from Baseline (%)	
Clean Vehicles	(230,334)	(766,726)	-11.6%	-70.2%
Housing and Land Use	(22,896)	(22,350)	-1.2%	-2.0%
Transit	(19,637)	(19,169)	-1.0%	-1.8%
Active Transportation	(1,796)	(1,092)	-0.1%	-0.1%
Travel Demand Management	(10,365)	(4,825)	-0.5%	-0.4%
Parking Pricing	(67,274)	(36,545)	-3.4%	-3.3%
Road Pricing	(214,279)	(92,082)	-10.8%	-8.4%
Combined Reduction	(514,131)	(816,451)	-25.9%	-74.8%

4.2 Vehicle Miles Traveled (VMT)

The CAP TLU Scenario is estimated to result in a 9.9 percent decrease in vehicles miles traveled by 2030 compared to the 2030 baseline scenario, and an 11.3 percent decrease in 2050 compared to the 2050 baseline scenario. Compared to 1990 baseline VMT, the CAP TLU Scenario is estimated to increase VMT by 7.3 percent in 2030 and by 17 percent in 2050. Notably, while the various strategies are effective at reducing VMT compared to a future without the plan’s strategies, increases in population and travel activity ultimately result in VMT increases in 2050 compared to the 1990 baseline. Table 11 shows the calculated reduction in both total miles as well as percentage reductions.

Table 11: Total Annual VMT Change from CAP TLU Scenario

	1990	2015	2030	2050
Baseline (million miles)	3,648	3,984	4,326	4,800
CAP TLU Scenario (million miles)			3,605	4,194
CAP TLU Scenario Change from 2030/2050 Baseline			(721)	(606)
CAP TLU Scenario Change from 2030/2050 Baseline (%)			-16.7%	-12.6%

CAP TLU Scenario Change from 1990 Baseline	(42)	546
CAP TLU Scenario Change from 1990 Baseline (%)	-1.2%	15.0%

Table 12 details the VMT impacts at the strategy level to show the impacts of each individual strategy compared to each year’s respective baseline total. For example, the “Transit” strategy is estimated to reduce VMT by 2 percent compared to the 2030 baseline scenario, and by 4.2 percent compared to the 2050 baseline scenario. Similar to the greenhouse gas totals, the VMT “combined reduction” estimate does not equal the exact summation of the individual strategy reductions, since each strategy’s individual effectiveness is impacted by the reductions of the other strategies. For example, the VMT reductions from pricing strategies will be lower if housing and land use strategies are separately reducing travel activity.

Table 12: VMT Change from Individual Strategies

Strategy Focus Area	2030	2050	2030	2050
	Change from baseline (million miles)		Change from baseline (%)	
Clean Vehicles ^a	59.8	259.9	1.4%	5.4%
Housing and Land Use	(65.9)	(153.8)	-1.5%	-3.2%
Transit	(56.5)	(131.9)	-1.3%	-2.7%
Active Transportation	(5.2)	(7.5)	-0.1%	-0.2%
Travel Demand Management	(29.8)	(33.2)	-0.7%	-0.7%
Parking Pricing	(163.5)	(179.7)	-3.8%	-3.7%
Road Pricing	(492.3)	(371.4)	-11.4%	-7.7%
Combined Reduction	(720.7)	(605.7)	-16.7%	-12.6%

^aThe Clean Vehicles strategy is currently estimated to increase VMT slightly compared to the baseline due to the “rebound effect.” This is a phenomenon in which a lower cost of driving per mile (in this case, because of the lower fuel costs of electric vehicles compared to gasoline powered vehicles) may lead people to drive more.

RACIAL AND SOCIAL EQUITY ASSESSMENT

APPENDIX D

Appendix D: Racial and Social Equity Assessment

BACKGROUND

SFE Equity Staff created a Racial and Social Equity Assessment Tool (RSEAT) to evaluate and improve the strategies in the CAP. The RSEAT is a worksheet which consists of a series of questions in five themes and 17 impact areas to address both the fair distribution of the benefits of climate action and the root causes of racial disparities. Community engagement through the [Anchor Partner Network](#) and consultation with [SF Planning's Racial and Social Equity Initiative](#) informed the development of the RSEAT. The tool includes a scale, which was developed with input from the [San Francisco Office of Racial Equity](#), to consider the level of equity achieved, distinguishing between transactional and transformational change. The scale was used to facilitate critical thinking rather than to score strategies, which would have been imprecise due to the subjective nature of self-assessment. The RSEAT also includes introductory data and information to orient the user to racial equity issues in San Francisco. The tool is included at the end of this appendix.

PROCESS

Technical Working Groups (TWGs) for each of the CAP's six sectors and other related working groups, such as the Racial Equity and Inclusion Committee for San Francisco's long-range transportation planning program ([ConnectSF](#)), completed an initial review of RSEAT worksheets before meeting with SF Environment Equity Staff to discuss findings. Strategies in the Responsible Production and Consumption, Energy Supply, and Building Operations sectors were evaluated and revised before draft Plan content was shared in public engagement. The RSEAT was applied to the Healthy Ecosystems, Housing, and Transportation and Land Use sectors after public engagement, due to SFE Equity Staff capacity shifting to completing [Phase 1 of SFE's Racial Equity Action Plan](#). The strategies in the Housing sector were explicitly designed to [dismantle San Francisco's housing inequities](#) and therefore received a less extensive review with the RSEAT than the other sectors.

When applying the RSEAT to strategies, SF Environment Equity Staff found similar issues surfaced across numerous Plan sectors. A summary of cross-sector equity issues, along with stakeholder feedback received during community engagement, were used as another mechanism to revise Plan strategies. The following section contains

descriptions of the 8 cross-sector equity issues and their related goals; proposed equity metrics for CAP strategies and systemic equity metrics that expand beyond the scope of the CAP; Climate Action response, including equity-specific details about CAP strategies and actions, and programs and plans which feed into the CAP; and recommendations to further advance racial justice.

FUTURE IMPROVEMENTS

Efforts to advance racial and social equity and diversity need to be inclusive of a wide range of identities. Future iterations of analysis tools would benefit from deeper community engagement to ensure inclusion of issues relevant to stakeholders who were not adequately represented in the RSEAT. For example, the original version of the tool did not include data or qualitative information about the local American Indian community, as SFE Racial Equity Staff engaged with [American Indian Cultural District](#) and [The Cultural Conservancy](#) toward the end of the development of the CAP. Additionally, increased engagement with and prioritization of the needs of people with disabilities would strengthen the diversity of the tool.

Furthermore, varying knowledge and experience of RSEAT users paired with the subjective nature of answering questions resulted in differences of opinion about how to address root causes. Departments are currently developing Phase 2 of their Racial Equity Action Plans, which focus on programs and service delivery, and can support the identification of high impact racial equity actions. While there are limitations that are built into the application of any desktop tools, including communities in future tool creation and use can support ground truthing information. To improve transparency, any revisions made as a result of community feedback and racial equity analysis should be communicated back to community stakeholders.

SUMMARY OF FINDINGS FROM RACIAL AND SOCIAL EQUITY ASSESSMENT

Equity Goal 1: Shift financial responsibility for climate action away from the parties least responsible for climate change

<p>Problem Statement: Some strategies to reduce emissions use fees, fines, or financial penalties to change behavior. Flat costs disproportionately burden lower-income populations.¹ There is a severe disparity in income by race and disability in San Francisco. Behavior-change strategies often request action from individuals rather than companies, do not consider an individual’s income and wealth, and look at behavior at the present, as opposed to lifetime contributions to climate change. Policies developed without engaging impacted parties can lead to unintended consequences. Some individuals may generate emissions when an alternative is not available to them, such as long commute distances due to housing unaffordability. Individuals who generate emissions due to lack of an alternative are not the most responsible. Other impacted parties include affordable housing providers, nonprofits and small businesses that serve or are owned by American Indian, Black, and other People of Color, and the disability community. Both climate change and the actions to mitigate it can be disruptive to people with disabilities, as many have fashioned an inter-connected system of supports, work-arounds and life “hacks” that are extremely fragile and cannot often withstand disruption.²</p>	
<p>CAP sectors involved: Building Operations Energy Supply Housing Responsible Production and Consumption Transportation and Land Use</p>	
<p>Tracking Progress</p>	
Proposed CAP Equity Metrics	<p>% eligible SFPUC customers on low-income rates; Electrical rates are affordable and reflect cost of service; # new affordable housing developments which receive information and technical support about building all-electric; % financial assistance for electrification retrofits distributed in communities with environmental justice burden as identified in EJ Communities Map;* Tons of recovered food donated to San Francisco CBOs serving residents in need; # Affordable housing sites that have removed or reduced contamination charges; % Incentives for greening project distributed to communities with environmental justice burden as identified in EJ Communities Map*</p>
Systemic Racial Equity Metrics	Reduced cost burdens for low-income populations
	Reduced income and wealth disparities by race
<p>Working Towards Equity Goal 1</p>	
Climate Action Response	New policy to decarbonize large commercial buildings will include an alternative compliance path that collects fees, with funds directed towards low-income and affordable housing support
	Technical assistance provided by SF Environment in decarbonization of existing buildings to include income-based fees and broad support for lower-income property owners
	Ensure robust engagement with stakeholders most affected by new policies to reduce emissions from building materials and construction activities, food, and “everyday” goods and consumer products
	Construction and demolition debris recovery transporter fees scaled by fleet hauling capacity, where commercial companies are charged more than independent haulers in smaller vehicles
	Extended producer responsibility strategy places a shared responsibility for end-of-life product management on producers, and other entities involved in the product chain, instead of only the general

¹ [San Francisco Financial Justice Project](#) assesses and reforms fines and fees that have an adverse disproportionate impact on low-income people and communities of color

² Mayor’s Office on Disability

	public. Producers become more accountable for the emissions from their goods and services, and work to redesign their operations to reduce lifecycle emissions across their supply chain
	Current refuse rates provide discounts to nonprofit housing organizations.
	Engage with community in planning for the change in electricity demand and usage due to electrification, expansion of programs and rates that provide low-income customers with renewable electricity , to ensure equitable electricity rates
	Research how to equitably decommission natural gas infrastructure
	Expand and maintain SFPUC programs , including bill assistance programs, to best meet the needs of low-income customers. Continue to ensure community engagement in the rate-setting process
	Provide financial assistance and education to lower income, small property owners to add housing, such as accessory dwelling units, and rehabilitate existing units that are healthy and resource efficient
	Income-based toll discount for regional express lanes pilot program ³
	Implement Downtown Congestion Pricing Study ⁴ recommendation to charge a fee to drivers who can afford it and provide discounts and exemptions for those who can't
	While using pricing to balance parking supply and demand , develop programs to reduce impact on low-income, auto-dependent people and ensure net benefit to low-income individuals
	Pursue equity structure for increasing fees to drive , such as income-based, exception for mobility-limited, exception for neighborhoods underserved by transit
Recommendations for the future	Evolution of consumption-based emissions inventory and accounting methods to include lifetime emissions ⁵
	Research conflicts and harmonies between green building and affordable housing , to understand impacts on housing cost, housing production, and affordable housing functions. Include lessons learned from assistance provided to affordable housing developments meeting solar and energy efficiency requirements
	In future refuse rate setting process , assess and improve the equity of contamination charges
	Pursue equity structure in changes to the Residential Parking Program and if fee structure increases, mirror the Muni Lifeline eligibility for reduced fees
	SF Environment and other departments involved in all-electric building policies to partner with organizations serving the disability community, to research, evaluate, and advocate for accessible appliance design ⁶

³ <https://mtc.legistar.com/LegislationDetail.aspx?ID=4677297&GUID=6C34D13C-2A96-41CD-9202-EB3FF7862DF7>;
<https://mtc.legistar.com/LegislationDetail.aspx?ID=4853980&GUID=B2A0125F-C6A5-410C-BBA8-35D82C227CD2>

⁴ <https://www.sfcta.org/downtown>

⁵ A Consumption-Based Emissions Inventory (CBEI) accounts for emissions created by the material extraction, production, and transport of goods and associated services flowing in and out of San Francisco.

⁶ American Foundation for the Blind: [An Overview Survey of Home Appliance Accessibility](#) and Mayor's Office on Disability: One challenge to be solved stems from the design of the controls of electric appliances. Older appliances used dials that can be modified to create a tactile interface that can be used by someone who is blind or low-vision. New digital interfaces tend to use a flat panel design that is inaccessible. San Francisco should advocate for accessible interfaces on electric home appliances, use its procurement requirements to influence the market for appliances and support innovation in the design of electric appliances for accessibility with partners such as the Lighthouse for the Blind. Artificial Intelligence products can serve as an accessibility aid through voice activation, but is not financially accessible to all. Electronics industry needs improvement in responsiveness to issues of accessibility.

Equity Goal 2: Increase opportunities for people with barriers to employment and reduce income disparities by race

<p>Problem Statement: Workforce development interventions are needed to ensure racial equity in the transition away from an extractive economy and provide opportunities for economically disadvantaged workers.⁷ Workers impacted by transitions in fuel and energy supply include those outside of the boundaries of San Francisco and California.⁸ BIPOC professionals experience discrimination in access to jobs and racial and ethnic diversity are not well represented in the environmental sector.⁹ Increased demand for sustainability professionals has the potential to benefit white workers, contributing to existing income and wealth disparities by race. People with disabilities are disproportionately poor and the largest unemployed group.¹⁰ Without strategic implementation, the legacy of discrimination will continue to serve as a barrier.</p>	
<p>CAP Sectors Involved: Building Operations Energy Supply Healthy Ecosystems Housing Responsible Production and Consumption Transportation and Land Use</p>	
<p>Tracking Progress</p>	
Proposed CAP Equity Metrics	% CleanPowerSF products and services procured from women, minority, disabled veteran, or LGBT owned business
Systemic Racial Equity Metrics	Reduced income and wealth disparities by race
	Increased City and County of San Francisco contract amounts awarded to Disadvantage Business Enterprises (DBEs) and Local Business Enterprises (LBEs); SFMTA tracking underway
	Increased income for people with barriers to employment
<p>Working Towards Equity Goal 2</p>	
Climate Action Response	Training through Friends of the Urban Forest, Literacy for Environmental Justice, Street Tree SF
	City College Evans Campus offers Automotive Hybrid & Electric Vehicle Technology Certificate
	Rising Sun Center for Opportunity High Road Training Partnership for building decarbonization in the Bay Area
	Prepare the building decarbonization workforce, with targeted support for disadvantaged workers
	Ensure development of clean energy resources prioritizes local job creation
	The City will engage American Indian tribes, cultural bearers, neighborhood organizations, local businesses, the San Francisco Unified School District and nonprofit organizations during the planning and implementation of greening projects , including for the purpose of local hiring and workforce development
	Opportunity for workforce development training in building deconstruction
SFUSD participation in the Good Food Purchasing Program (GFPP) ¹¹ aims to procure from minority-owned farms and businesses	

⁷ [First Source Hiring Program](#) requires that developers, contractors, and employers utilize good faith efforts toward employing economically disadvantaged San Franciscan residents for entry level positions on applicable projects.

⁸ California imports 90% of the natural gas it consumes

⁹ <https://diversegreen.org/research/>

¹⁰ Mayor's Office on Disability

¹¹ In the Local Economies value category of the Good Food Purchasing Standards, more credit is given to small family- or cooperatively-owned businesses versus larger family- or cooperatively-owned businesses. Extra credit is awarded to purchases from suppliers that are categorized as Socially Disadvantaged, Beginning, Limited Resource, Veteran, Women, Minority, or Disabled. <https://goodfoodpurchasing.org/>

	Expand green construction training and apprenticeship programs to grow the local pool of skilled labor and reduce construction costs
Recommendations for the Future	Explore opportunities for OEWD to expand construction training program into landscaping and open space management, tree planting and maintenance to support healthy ecosystems
	City and County of San Francisco funds or identifies funding to expand CityBuild Pro for building materials reuse and carbon accounting professional services and enhance existing programs to include information on applying skills to careers in sustainability
	All CCSF Departments that participate in the GFPP procures from minority-owned farms and businesses
	Training for sustainable aviation fuel and low carbon fuels and retraining for traditional fuel workers
	Explore expanding messaging to shift consumption to reduce emissions to also advance racial equity, such as shopping locally <i>and at</i> BIPOC-owned businesses
	Explore opportunities for expanded workforce development in expansion of bike, electric vehicle charging, and transit infrastructure
	SFE and other CAP implementers focus outreach, technical assistance, incentives, and other resources on racial/ethnic affinity professional organizations, particularly those involved in training and increasing diversity in the environmental field, and on organizations serving the disability community
	SFE and other CAP implementers to investigate opportunities to partner with companies involved in Climate Action, such as electric vehicle manufacturers, which have been successful at advancing racial and disability justice
	Fuel and energy purchased by San Francisco have impacts outside its geographical boundary, explore opportunities to support workers impacted by the transition away from fossil fuels outside San Francisco and California

Equity Goal 3: Reduce burden on and increase support for BIPOC-owned small businesses and nonprofits and reverse their displacement

<p>Problem Statement: San Francisco has experienced an increase in business closures and relocations in the last two decades.¹² Data in 2018 indicated rising vacancy rates in some neighborhood commercial districts.¹³ The impact of the COVID-19 pandemic was still present in June 2021, where small business revenue was 50% below the pre-COVID baseline.¹⁴ Smaller businesses and businesses owned by People of Color have faced challenges in accessing federal relief.¹⁵ Small businesses and nonprofits employ people in the community, provide goods and services, and protect cultural legacy and neighborhood identity. Costs of complying with sustainability measures may disproportionately burden small businesses. Policies and programs that impact small businesses do not always include culturally competent outreach and language access.</p>	
<p>CAP Sectors Involved: Building Operations Energy Supply Healthy Ecosystems Responsible Production and Consumption Transportation and Land Use</p>	
<p>Tracking Progress</p>	
Proposed CAP Equity Metrics	% Small businesses in communities with environmental justice burden as identified in EJ Communities Map * which receive information and technical support about refrigerants ; Tons of rescued building materials received by nonprofits and small businesses in communities with environmental justice burden as identified in EJ Communities Map ;* # Small business sites that have removed or reduced contamination charges
Systemic Racial Equity Metrics	Reversed displacement of nonprofits and small businesses which are BIPOC-owned and serving
	Reduced income and wealth disparities by race
<p>Working Towards Equity Goal 3</p>	
Climate Action Response	When designing SFPUC customer programs , consider needs of BIPOC-owned and serving small businesses
	Partner with OEWD to study and document if the transition to efficient and all-electric buildings poses displacement risks for BIPOC-owned and serving small businesses and propose solutions
	Via the Clean Energy Buildings Hub , provide outreach, education, and technical assistance to ethnic restaurants regarding culturally appropriate low-carbon cooking methods
	SF Environment to explore opportunities to partner with the California Product Stewardship Council (CPSC) and OEWD in supporting BIPOC-owned businesses and nonprofits in the reuse, repair, and recovery economy
	SFE to work with OEWD to deliver rescued building materials to small businesses and nonprofits
Recommendations for the Future	SF Environment and other CAP implementers to improve engagement with Black and other ethnic chambers of commerce, small businesses, and nonprofits in future policy development, delivery of technical assistance and other resources.
	City and County of San Francisco holistically collect data on race/ethnicity and language spoken by business owners to better understand needs and deliver targeted technical assistance and support ¹⁶

¹² https://default.sfplanning.org/plans-and-programs/community-planning/stabilization-strategy/cs_report_draft01.pdf

¹³ <https://oewd.org/sites/default/files/Invest%20In%20Neighborhoods/State%20of%20the%20Retail%20Sector%20-%20Final%20Report.pdf>

¹⁴ <https://sfchamber.com/resources/data-statistics/>

¹⁵ <https://www.responsiblelending.org/sites/default/files/nodes/files/research-publication/crl-cares-act2-smallbusiness-apr2020.pdf>

¹⁶ [Black-Owned Businesses in San Francisco](#) was compiled by OEWD in response to George Floyd's murder, and is not comprehensive of every business

	Investigate local government ability to advance telework equity
	When increasing types of home-based businesses allowed in residential districts , pursue opportunities to work with equity-based networks and incubators and neighborhood merchants' associations and measures to increase resources to BIPOC-owned and serving businesses.
	Prioritize engagement with BIPOC-owned and serving businesses when implementing changes to parking management
	Culturally competent engagement is needed with small businesses to understand impacts and challenges that measures to reduce waste may bring, such as technical or financial burdens on struggling businesses. Resources should be targeted to support those businesses. New policies to reduce waste should start with large businesses. Enforcement of existing policies should prioritize large businesses.

Equity Goal 4: Repair land and property injustice

<p>Problem Statement: Institutional decisions rooted in white supremacy have resulted in unequal land and property ownership opportunities for American Indian, Black, and other People of Color. The Ramaytush Ohlone peoples, the original inhabitants of the area comprising the City and County of San Francisco, were forcibly removed from their homelands and subjected to the brutalities of colonialism, enslavement, genocide, discrimination, racism, gender-based violence, theft, forced assimilation, and other atrocities driven by local, federal, and global governments. Ramaytush Ohlone peoples are not a mythical population of the past, but an integral and active community in the present San Francisco Bay Area region and beyond, whose ongoing exclusion and invisibility denies their recognition as the rightful stewards of the land and contributes to the greater American Indian community’s lack of inclusion in San Francisco.¹⁷ The Indian Relocation Act, Redevelopment and Urban Renewal Act, redlining, and other racially discriminatory housing practices produced disparities still evident today— 87% of San Francisco’s redlined neighborhoods are low-income neighborhoods undergoing gentrification today.^{18 19 20 21 22} People with disabilities are disproportionately unhoused.²³</p>	
<p>CAP Sectors Involved: Building Operations Energy Supply Healthy Ecosystems Housing Transportation and Land Use</p>	
<p>Tracking Progress</p>	
Proposed CAP Equity Metrics	<p>% BIPOC residents living in San Francisco, % annual incoming residents that are BIPOC, % displaced residents that are BIPOC annually; % BIPOC, low-, and moderate-income in higher resource neighborhoods; % New affordable housing units occupied by BIPOC; # Acres of natural areas dedicated for American Indian stewardship; # Carbon sequestration farming pilot projects which include Indigenous science and/or Traditional Ecological Knowledge</p>
Systemic Racial Equity Metrics	Increased land back, traditional land use, and management by local tribes and the American Indian community
	Reversed displacement of American Indian, Black, and other People of Color
	Reduced disparity in homeownership by race
	Reduced disparity in wealth by race
<p>Working Towards Equity Goal 4</p>	
Climate Action Response	Leverage every housing action and investment to help reverse historic racial, ethnic, and social dispossession, and enable wealth-building for affected communities
	Prioritize affordable housing in cultural districts and other relevant geographies with historically marginalized racial or ethnic identities to encourage their stabilization and return.
	Increase equitable community participation and perspectives in nature-based climate solutions , including meaningful efforts to prioritize Indigenous science and Traditional Ecological Knowledge. The City will honor Indigenous knowledge from the original stewards of these lands (Yelamu) and create strong partnerships through meaningful engagement with the Ramaytush Ohlone and the American Indian community to participate in stewardship of lands managed by San Francisco.

¹⁷ San Mateo County [Ma Da Dil Farm](#) land stewardship return to [Ramaytush Ohlone](#), land repatriation [Sogorea Te' Land Trust](#) in East Bay Area

¹⁸ Reparations task forces are underway in San Francisco and California

¹⁹ <https://www.urbandisplacement.org/redlining>

²⁰ Schuetz, Jenny. [Rethinking homeownership incentives to improve household financial security and shrink the racial wealth divide](#). Brookings. December 9, 2020

²² Just 22% of American Indian householders, 23% of Black, and 24% of Latinx householders own their own homes compared to 36% of white householders and 48% of Asian householders. IPUMS data 2014-2018. https://commissions.sfplanning.org/cpcpackets/2020-008417CWP_011421.pdf

²³ Mayor’s Office on Disability

Recommendations for the Future	During time of sale residential building decarbonization policy creation , pursue equity measures which repair the impacts of housing discrimination.
	When developing renewable energy projects, consider historical land use and impacts on communities
	Expand affirmative housing ownership and other reparative measures
	Identify opportunities to dedicate land to the American Indian community through the 2022 Housing Element update to the General Plan, and establish partnerships around land use for traditional and ceremonial purposes
	When evaluating underutilized space , engage with American Indian community to identify culturally relevant land and take leadership in reprogramming land use

Equity Goal 5: Protect low-income residential tenants from rising costs and displacement and support development of affordable housing

<p>Problem Statement: Building improvements, such as installing solar panels and removing natural gas, can bring benefits to tenants. There may also be negative impacts, such as landlord passthrough of capital costs that are unaffordable to tenants or prolonged renovation periods resulting in an eviction (a so-called “renoviction”). Generally only landlords are eligible to receive financial support for the building improvement. Benefits may also be determined by utility rates, who pays for utility costs, and whether overall costs increase or decrease for tenants. BIPOC residents have higher cost burdens and low-income renters make up the vast majority (82%) of the estimated 82,000 cost-burdened renters, paying more than 30% of income in rent.²⁴ During the pandemic, an estimated 15% of renters had some unpaid rent.²⁵</p>	
<p>CAP Sectors Involved: Building Operations Energy Supply Housing Responsible Production and Consumption</p>	
<p>Tracking Progress</p>	
Proposed CAP Equity Metrics	<p>% eligible SFPUC customers on low-income rates; Electrical rates are affordable and reflect cost of service; # new affordable housing developments which receive information and technical support about building all-electric; % BIPOC residents living in San Francisco, % annual incoming residents that are BIPOC, % displaced residents that are BIPOC annually; % and # New residential units serving vulnerable and underserved populations; % and # Existing residential units rehabilitated for vulnerable and underserved populations; % New affordable housing units occupied by BIPOC; Tons of recovered food donated to San Francisco CBOs serving residents in need; # Affordable housing sites that have removed or reduced contamination charges</p>
Systemic Racial Equity Metrics	Reduced housing cost burden for low-income tenants
	Reversed displacement of American Indian, Black, and other People of Color
<p>Working Towards Equity Goal 5</p>	
Climate Action Response	In buildings transitioning to efficient and all-electric , SF Environment to work with Rent Board, Planning, tenants organizations, and other community stabilization stakeholders to make passthroughs of capital costs more equitable and reduce renovictions of lower income tenants
	Expand and maintain SFPUC programs , including bill assistance programs, to best meet the needs of low-income customers. Continue to ensure community engagement in the rate-setting process
	Passthroughs associated with incentives for clean energy are limited
	Expand tenant services including education, outreach, counseling, and legal and rent assistance to keep local residents and workers housed in SF
	Acquisition and preservation of existing, affordable, multi-family housing and its rehabilitation
Recommendations for the Future	<p>SF Environment to work with affordable housing and tenant organizations to review utility costs and other impacts to tenants in all-electric buildings, investigate if expanding refuse rate discounts for nonprofit affordable housing organizations could benefit residents and/or create more affordable housing, with the potential to expand evaluation to other types of building improvements and sustainability requirements.</p>

²⁴ https://commissions.sfplanning.org/cpcpackets/2020-008417CWP_011421.pdf

²⁵ Budget and Legislative Analyst’s Office. *Estimate of unpaid residential rent in San Francisco due to COVID-19 pandemic and related public health orders*. October 27, 2020.

Equity Goal 6: Support all mobility needs, including for those who are vehicle-reliant

<p>Problem Statement: Vehicles are a significant contributor to pollution in San Francisco, with higher levels of air pollutant exposure occurring in areas near freeways and major streets.²⁶ Transit and active transportation are not sufficient substitutes to vehicles for the mobility access for some individuals, including people with disabilities.²⁷ Vehicles are necessary for certain types of jobs, including construction and delivery. Neighborhoods underserved by transit²⁸ and people with disabilities may rely on paratransit,²⁹ community shuttles,³⁰ and personal vehicles to access services.</p>	
<p>CAP Sectors Involved: Transportation and Land Use</p>	
<p>Tracking Progress</p>	
Proposed CAP Equity Metrics	# Community-endorsed charging infrastructure projects in communities with environmental justice burden as identified in EJ Communities Map *
Systemic Racial Equity Metrics	Improved mobility in areas underserved by transit based on community needs, including implementation of Bayview Community Based Transportation Plan
	All people in SF have mobility that is comfortable, affordable, and reliable
	Improved air quality in high air pollutant exposure zones
<p>Working Towards Equity Goal 6</p>	
Climate Action Response	Ongoing review of increases in fares or changes in service for compliance with Title VI ³¹
	Continued personal vehicle use and paratransit
	Create new or improve transit connections for underserved areas and improve accessibility to local and regional destinations
	Conduct research to find out what changes would attract more seniors and people with disabilities to choose public transit over private cars, and implement as many as feasible. To support a shift away from cars, the accessibility office at SFMTA will need more resources, as will relevant transit infrastructure, such as improved elevator maintenance.
	Design a pilot project to test the use of accessible bicycles, e-bicycles and e-scooters for commuting, as well as recreation, including evaluation of infrastructure to support accessible bicycles. ³²
	Implement a program to prioritize access and parking for people with disability parking placards.
	Increase awareness of affordable electric vehicle options for vehicle-reliant people
	Work with small businesses to identify infrastructure needs for converting fleets to electric vehicles

²⁶ <https://www.sfdph.org/dph/EH/Air/Article38.asp>; <https://sfplanning.org/air-quality-community-risk-reduction-plan>; <https://www.sfdph.org/dph/files/EHSdocs/AirQuality/AirPollutantExposureZoneMap.pdf>

²⁷ Reduced-cost rides provided to seniors and adults with disabilities through [Essential Trips](#) program

²⁸ [Muni Service Equity Strategy](#) is an ongoing effort to improve service performance in eight neighborhoods; [Southeast Muni Expansion](#) includes new Muni bus routes, Muni bus route extensions and reroutes, and more frequent service on existing Muni bus routes in San Francisco's southeastern neighborhoods – Bayview, Hunters Point, and Visitacion Valley and SFMTA is seeking funding to implement some of transit service improvements recommended in the Bayview Community Based Transportation Plan sooner

²⁹ Compliance with Americans with Disabilities Act regulations, including paratransit and other services: <https://www.sfmta.com/units/accessible-services>

³⁰ Policy recommendation in Bayview Community Based Transportation Plan

³¹ As a designated recipient of federal funds under FTA sections 5307 and 5309, SFMTA is subject to Title VI of the Civil Rights Act of 1964

³² Mayor's Office on Disability: some of the common models of accessible bicycles are too wide for current bike lanes

Recommendations for the Future	Improve engagement with the disability community in the expansion of the Slow Streets program
	Financial and technical assistance for small businesses transitioning to electric vehicle fleets
	Consider income-based fee structure for public electric vehicle charging, reflecting Muni Lifeline eligibility
	City and County of San Francisco to investigate opportunities to support research and development of all-electric vans and other vehicles which can meet the needs of the disability community. ³³

³³ <https://www.theverge.com/2021/7/2/22550853/electric-vehicles-disabled-wheelchair-conversion-battery>

Equity Goal 7: Ensure equitable development and service provision, while preventing displacement

Problem Statement: Displacement and resource distribution are racial equity issues in San Francisco and the Bay Area.³⁴ Some CAP strategies will bring new services to neighborhoods, such as bike and transit access, tree canopy and parks and recreation access. Development can occur in communities which is assumed to be a benefit but does not actually meet their needs. This mismatch may occur when there is inadequate engagement and representation on decision-making bodies. Inadequate racial and ethnic representation is acute in climate action. Perspectives and contributions of BIPOC environmentalism have been underrecognized in the sustainability field, which centers whiteness. It is important to acknowledge such exclusion, and also be careful of the potential to perpetuate stereotypes. Describing access to nature, certain recreational activities, and other environmentally-oriented activities as things for white people has the potential to discourage BIPOC participation and consequently remove opportunities. People with disabilities experience barriers in society which prevent them from having control over their lives. Much of the time, the people responsible for these inadvertent barriers are not aware of them or their impact.³⁵ A history of exclusion and neglect can be improved through increased inclusion of the diverse needs of the disability community (i.e., mobility limited, blind, Deaf, developmentally disabled) and improved compliance with the Americans with Disabilities Act, at a minimum. New development and services bring displacement risks and fears. There are displacement risks and concerns attached to bringing services and benefits to more neighborhoods.³⁶ Protections are needed to ensure that current residents can afford to enjoy new services. Anti-displacement measures are similarly critical in areas rezoned to increase density. There are roles for both neighborhood-scale and citywide anti-displacement measures that build on the existing strengths, experience, and social capital of these neighborhoods.

CAP Sectors Involved: Building Operations Energy Supply Healthy Ecosystems Housing Responsible Production and Consumption Transportation and Land Use

Tracking Progress

<p>Proposed CAP Equity Metrics</p>	<p># Low-income customers enrolled in SFPUC customer programs; % Neighborhoods and % business districts with a community-endorsed plan for coordinated electrification; % Electrification projects in communities with environmental justice burden as identified in EJ Communities Map;[*] # Community-endorsed charging infrastructure projects in communities with environmental justice burden as identified in EJ Communities Map;[*] % BIPOC residents living in San Francisco, % annual incoming residents that are BIPOC, % displaced residents that are BIPOC annually; % and # New residential units serving vulnerable and underserved populations; % and # Existing residential units rehabilitated for vulnerable and underserved populations; % BIPOC, low-, and moderate-income in higher resource neighborhoods; % New affordable housing units occupied by BIPOC; # nature-based solutions plans and policies evaluated and improved using racial equity tools; % natural areas added or restored through community-endorsed processes in communities with environmental justice burden as identified in EJ Communities Map;[*] # Orgs representing BIPOC communities in urban forest plan development; % Trees planted in communities with environmental justice burden as identified in EJ Communities Map;[*] % Incentives for greening project distributed to communities with</p>
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³⁴ San Francisco experienced a 17% decrease in low-income Black households between 2000-2015, primarily in historically Black neighborhoods, and the Bay Area experienced decreases in flatland neighborhoods in Oakland and Berkeley, East Palo Alto, Richmond, and Vallejo. San Francisco also experienced a decrease in low-income Asian and Latinx households in historic neighborhoods such as Chinatown, the Mission, and SoMa, and the Bay Area experienced decreases in neighborhoods in Oakland and San Jose which have historically been home to large immigrant communities. In 2015, low-income White households in San Francisco were 3 times more likely (and in the entire Bay Area 7 times more likely) to live in higher resource areas than moderate- and high-income Black households.

https://www.urbandisplacement.org/sites/default/files/images/sf_final.pdf; https://www.urbandisplacement.org/sites/default/files/images/bay_area_re-segregation_rising_housing_costs_report_2019.pdf

³⁵ Mayor’s Office on Disability

³⁶ https://www.urbandisplacement.org/sites/default/files/images/climate_and_displacement_-_lit_review_6.19.2020.pdf

	environmental justice burden as identified in EJ Communities Map ; [*] # Carbon sequestration farming pilot projects which include Indigenous science and/or Traditional Ecological Knowledge
Systemic Racial Equity Metrics	Reversed displacement of BIPOC communities
	Reversed health disparities by race
	Increased representation from BIPOC communities in decision-making roles
Working Towards Equity Goal 7	
Climate Action Response	SFPUC ³⁷ and SF Planning ³⁸ commitments to updating engagement practices to advance equity; SFMTA commitment to equitable engagement in determining location for new transit and active transportation infrastructure
	Neighborhood design where people live within and easy walk or roll of their daily needs will be co-developed by City agencies and residents.
	Design public space and the transportation system (including roadways) to advance racial and social equity by co-developing public spaces with BIPOC community members and understanding their needs before designing the space.
	Design public space and the transportation system to advance disability justice by co-developing plans and projects with diverse elements of the disability community and understanding their needs before designs are complete.
	Include community benefits criteria for renewable energy and other contracts of \$5 million or more and thus give preference to contracts that demonstrate a commitment to community benefits and environmental justice.
	Programs, such as community solar , allow renters, particularly those designated by CalEnviroScreen as Disadvantaged Communities, to participate in local renewable electricity production
	The City will engage American Indian tribes, cultural bearers, neighborhood organizations, local businesses, the San Francisco Unified School District and nonprofit organizations during the planning and implementation of greening projects
	Open space, tree planting/management projects that meet community-identified needs are implemented in BIPOC, low-income, and neighborhoods underserved by greenspace
Recommendations for the Future	Stabilize communities receiving the City's greening projects and integrate lessons learned from green displacement prevention measures, such as the Equitable Development Plan for India Basin Waterfront Parks Renovation Project linking park creation with protections for surrounding affordable housing
	Improve engagement with and prioritize the needs of the disability community in park design and maintenance

³⁷ <https://sfpuc.sharefile.com/share/view/s91adfa4672e452d9>

³⁸ https://sfplanning.org/sites/default/files/documents/admin/R-20738_Centering_Planning_on_Racial_and_Social_Equity.pdf

	Continually review and improve anti-displacement measures attached to implementing new services or increased density
	Pursue opportunities to increase affordable housing production in transit corridors with access to essential services
	Create ongoing long-term partnerships with community organizations, learning from recommendation in Bayview CBTP to hire an on-call CBO; work with CBOs to understand what residents need and create solutions together; do not assume something is a universal benefit; treat community members as experts about their own needs
	Increase resources to support the relocation or establishment of nonprofit, affordable retail, and businesses that meet community needs in new developments
	Improve representation for BIPOC communities in the Urban Forestry Council, Pedestrian Safety Advisory Committee , other commissions and boards with low or no representation of People of Color ³⁹
	Improve engagement in all CAP Sectors and work with environmental leaders who are American Indian, Black, and other People of Color to retell history that reduces white supremacist narratives and reshapes framing of environmental movement

³⁹ <https://sfgov.org/dosw/sites/default/files/2019%20Gender%20Analysis%20of%20Commissions%20and%20Boards.pdf> Figure 10, page 14

Equity Goal 8: Reduce racial bias and discrimination in government and community processes

<p>Problem Statement: Racial bias and colorism result in violence and death for Black and Brown people, at the hands of police and other enforcement officers.⁴⁰ While San Francisco has been a Sanctuary City since 1989, the impact of enforcement varies depending on immigration status.⁴¹ Black and Brown neighborhoods have long endured over-policing and can also be neighborhoods with lower ability to pay fines. Conversely, there has been an underenforcement of polluting activities in environmental justice communities,⁴² and disparities in maintenance of parks across neighborhoods.⁴³ Activities such as permitting and inspections may also be impacted by implicit and/or explicit bias. Further, lower-income residents are more likely to endure substandard housing conditions due to lack of affordable options. Bias and discrimination also persist beyond government processes. Developing affordable and supportive housing in higher resource neighborhoods will more equitably allocate resources, but BIPOC and low-income populations face prejudice and may experience disenfranchisement in neighborhoods which have historically been exclusionary. Underserved communities may have strong social cohesion, and cohesion may be impacted during relocation to high service neighborhoods.</p>	
<p>CAP Sectors Involved: Building Operations Energy Supply Healthy Ecosystems Housing Responsible Production and Consumption Transportation and Land Use</p>	
<p>Tracking Progress</p>	
Proposed CAP Equity Metrics	
Systemic Racial Equity Metrics	Reduced disproportionate arrests of Black and Brown people
<p>Working Towards Equity Goal 8</p>	
Climate Action Response	Enforcement of construction and demolition debris recovery requirements designed to be distributed equally across all Supervisorial Districts
	Recology conducts randomized audits for properties that fall under Resource Separation Ordinance —which generate 40 cubic yards and above, likely to be large buildings
	Improve rider comfort, safety, and experience on transit across age, gender, race, and ability. Example activities include community engagement, data collection, reporting, sensitivity training of fare inspectors, and expanding the Muni Transit Assistance Program.
Recommendations for the Future	Increase engagement with Black, Brown, undocumented, and non-English speaking communities for policies which increase or create new opportunities for enforcement and/or surveillance. Continually evaluate and revise enforcement practices so that they effectively advance racial equity. Shift enforcement of policies to reduce emissions to the largest polluters.
	As neighborhoods transition away from being exclusionary, equitable and transparent decision-making processes, support for new residents to participate in community decisions, and antiracism and inclusion education of existing residents are needed. Engagement with BIPOC, people with disabilities, low-income populations, residents in subsidized housing, and other new residents

⁴⁰ Following protests in 2020, San Francisco redirected funds from law enforcement to the Black and African American community: <https://sfmayor.org/article/mayor-london-breed-announces-spending-plan-historic-reinvestment-san-franciscos-african>; <https://sf-hrc.org/sites/default/files/Reallocation%20of%20City%20Funding%20Report.pdf>

⁴¹ [Bayview Community Based Transportation Plan](#): Latinx residents have expressed concerns with bias in fare enforcement and frustration with the process of contesting tickets. For low-income residents, especially for undocumented residents that may not be willing to contest, a ticket can be a crushing burden.

⁴² <https://www.bvhp-ivan.org/>

⁴³ <https://sfgov.org/scorecards/livability/park-maintenance-scores>

	<p>moving into higher resource neighborhoods, and incorporating lessons learned from related efforts (such as community housing organizations which have experience with mixed-income properties) will be critical.</p>
	<p>Evaluate building permitting and inspection processes for potential bias and research strategies to reduce implicit and explicit bias.</p>
	<p>Increase financial and technical support for low- and moderate-income building owners to legalize housing units and other properties that do not conform to existing building, fire, and planning codes.</p>
	<p>Improve maintenance of lowest-scoring parks, half of which were in the southern part of San Francisco.</p>
	<p>Research strategies to reduce bias in reporting refuse bin contamination, currently individual truck drivers have discrepancy.</p>
	<p>Shift community safety duties away from the police, and learn from Bayview CBTP, should this policy recommendation be implemented</p>
	<p>Engage with all communities on fare enforcement concerns, and increase resident capacity to contest tickets and report biased behavior from fare enforcement officers</p>
	<p>Focus parking management in higher resource neighborhoods</p>

RACIAL AND SOCIAL EQUITY ASSESSMENT TOOL

Background

WHY SHOULD SAN FRANCISCO PRIORITIZE EQUITY IN ITS CLIMATE PROGRAM?

While San Francisco has made progress in reducing greenhouse gas emissions, it has been falling short in other ways. Income inequality is growing, and housing insecurity, homelessness, and displacement are also worsening. These disparities, among others, are more pronounced when intersected with race. In 2017, the median household income in San Francisco was \$96,265. Households which were white alone, not of Hispanic/Latinx origin, had median income of \$121,204, which is twice the median income for Hispanic/Latinx households. Median income for Asian households was \$82,445 and Black households \$30,235.⁴⁴ Most housing cost burdened households are extremely low- and very low-income households. Black and Hispanic/Latinx renters face the highest rates of cost burden with nearly half of both groups cost burdened or severely cost burdened. Asian and Pacific Islander renters also experience elevated rates of cost burden.⁴⁵ In 2017, in San Francisco, Black residents made up 5.3 percent of the city's population, when these residents had previously made up 11 percent of the city's total population in 1990. In the time span of 25 years, the proportion of the Black population in San Francisco was reduced by half, a far more rapid decline than the rest of the Bay Area.⁴⁶

Across every social indicator, when data is disaggregated by race, the legacy of more than two hundred years of racially discriminatory government policies is evident in San Francisco. Racial disparities can be measured in unemployment, health, household income, housing and

displacement, criminal justice, police violence, homelessness, education, and composition of the City and County of San Francisco's workforce.⁴⁷ Climate change exacerbates these disparities. People of color and low-income residents are least responsible for, yet most vulnerable to the impacts of climate change. Strategies to reduce greenhouse gas emissions have the potential to exacerbate disparities if not intentionally designed for equity. With the update to San Francisco's Climate Action Plan (CAP), the intent is to go beyond traditional emissions reduction strategies and intentionally design strategies that advance racial and social equity.

LEADING WITH RACE

This assessment prioritizes equity for Black, Indigenous, and People of Color (BIPOC), low-income populations, and/or other vulnerable populations through the lens of intersectionality. The additional vulnerable populations are defined in the document as: older adults, youth, homeless or marginally housed residents, non-English speaking people, immigrants, people with disabilities, people who are socially isolated, and people with pre-existing health conditions. This assessment leads with race because society produces unequal outcomes for BIPOC, and there is an intersectionality between race and other forms of marginalization. Intersectionality refers to the interconnected nature of social categorizations as they apply to a given individual or group, regarded as creating overlapping and interdependent systems of discrimination or disadvantage. When race is intersected with any other disadvantaged social categorization the outcomes for that individual or group are worse. If not designed specifically to advance racial equity, a solution is less likely to be successful at reducing racial disparities. However, data are not always collected about race. Disparities in wealth and income by race are well

⁴⁴ American Community Survey 2017 5-Year Estimates, Table S1903.

https://factfinder.census.gov/bkmk/table/1.0/en/ACS/17_5YR/S1903/0500000US06075 (Accessed 2019)

⁴⁵ San Francisco Planning Housing Needs and Trends Report 2018

⁴⁶ San Francisco Planning Community Stabilization Report 2019

⁴⁷ <https://sfgov.legistar.com/LegislationDetail.aspx?ID=3950582&GUID=9F233DC0-845B-483B-9570-ED75D67A8594>

<https://sfgov.legistar.com/View.aspx?M=F&ID=7586870&GUID=9E0222B9-7A4D-4082-8CCE-3F397520FC82>

documented in San Francisco and the Bay Area. While not identical, issues faced by low-income populations may be representative of issues faced by some communities of color. Similar to race, poverty and/or financial insecurity exacerbates the disadvantage and marginalization experienced as a result of certain other social categorizations. Poverty and racial and ethnic inequality are the two foundational issues identified in the [2019 San Francisco Health Needs Assessment](#).

LEVEL OF EQUITY

Interventions to reduce disparities and advance equity vary in scope; they can take the form of targeted benefits and specialized program design, or be designed to address the fundamental drivers of the inequity. Equity can be advanced by providing inclusive access to benefits by removing barriers and targeting investment, such as providing subsidies for green technologies to those who can't afford them. These strategies work to deliver benefits from a particular program to populations who may not have had access, and can work to protect the most vulnerable. Strategies which address the root cause of the vulnerability, inequity, and/or barrier take equity work deeper. For example, instead of only asking the question, "How can we provide the benefits of green technologies to those who can't afford them?", a root cause analysis would result in the question, "Why can't some people afford green technologies and how can we address those underlying issues (such as disparities in income and wealth accumulation)?"

ASSESSMENT PROCESS

The Racial and Social Equity Assessment Tool (RSEAT) is a worksheet to evaluate emissions reduction strategies submitted to the 2020 Climate Action Plan (CAP) for racial and social equity impacts. The assessment enables strategy developers to identify opportunities to provide benefits to all San Franciscans, mitigate negative unintended consequences for BIPOC, low-income populations, and other vulnerable populations and, where possible, address the root causes and fundamental drivers of inequity. RSEAT was developed through stakeholder engagement on residential building

decarbonization collaboratively led by SFE, [People Organizing to Demand Environmental and Economic Justice \(PODER\)](#), and [Emerald Cities San Francisco Bay Area](#), consulting literature, the [Equity Assessment Tool](#) prepared by Race Forward for the [Zero Cities Project](#) and guidance from the [Office of Racial Equity \(ORE\)](#) and the [Planning Department's Community Equity Team](#). Five Themes and supporting *Impact Areas* are addressed under RSEAT: 1) Income and wealth equality (including Just Transition for workers); 2) Housing security and community stability; 3) Inclusion and empowerment; 4) Health; and 5) Hazard and climate resilience. The *Examples of Progress* column in the tool provides more information about how to track progress on each of the *Key Statements*. Some of these *Examples* are population-level data. It is difficult to attribute changes in these indicators to any individual strategy, as there are many contributing factors to systemic problems. The complex nature of systemic problems can result in a lack of accountability, where individual initiatives determine the systemic problem to be outside of certain project scope. Each strategy in the CAP will include an equity metric, with progress measured over time. While equity metrics included in the CAP will likely pertain to equitable access, when feasible strategies should be designed to address systemic problems, in order to make progress on these pervasive issues.

ORE guided the development of a Scale to evaluate the potential of a strategy to:

- +2** Repair root causes of racial disparities; dismantle systems of oppression; structural and systemic changes such as large policy and budgetary action
- +1** Mitigate symptoms of systemic racism; interpersonal and operational changes; working within the current system to make it better such as through inclusive access to existing services
- 1** Maintain the status quo of racial disparities

-2 Perpetuate racial disparities and harm

Assessment

Strategy:						
Theme	Impact Area	Key Statement	Examples of Progress*	Scale (orange=current ; green=potential)	Equity Considerations	
1. INCOME AND WEALTH EQUALITY	Economic Opportunity	This strategy will reduce poverty and disparities in income and wealth accumulation for Black, Indigenous, and People of Color (BIPOC), low-income populations, and/or other vulnerable populations” through the lens of intersectionality” through increased access to business opportunities and/or skilled and professional jobs.	<ul style="list-style-type: none"> - Reduced income inequality gap between racial/ethnic groups - Reduced disparities in access to banking products - Increased land and homeownership opportunities for BIPOC 	-2 -1 +1 +2 N/A		
	Workforce Development	This strategy will increase opportunities for people with barriers to employment.	<ul style="list-style-type: none"> - Reduced unemployment rates by race - Retained and promote living-wage jobs for entry level and limited skilled workers - Stabilized business that employs low-to moderate-income workers - Increased education and job training opportunities for low-to moderate-income individuals and families, especially those without a college education 	-2 -1 +1 +2 N/A		

Strategy:					
Theme	Impact Area	Key Statement	Examples of Progress*	Scale (orange=current ; green=potential)	Equity Considerations
	Just Transition for Workers	This strategy supports the transition of workers from an extractive economy to a low-carbon one that maximizes benefits of climate action while minimizing hardships for workers and their communities.	<ul style="list-style-type: none"> - Job loss and gain - Improved worker health and safety - Largest polluter/ Most responsible party pays for the transition 	-2 -1 +1 +2 N/A	

Strategy:					
Theme	Impact Area	Key Statement	Examples of Progress*	Scale (orange=current ; green=potential)	Equity Considerations
2. HOUSING SECURITY AND COMMUNITY STABILITY	Household Affordability	This strategy will improve affordability (incl. household costs for rent/mortgage, transportation, energy) for BIPOC, low-income populations, and/or other vulnerable populations** through the lens of intersectionality.***	<ul style="list-style-type: none"> - Reduced rates of housing cost burden by race - Reduced rates of low-and moderate-income households that are housing cost burdened without loss of low- and moderate-income households - Increased number of affordable housing units for low-and moderate-income residents - Reduced homeownership disparities by race - Meeting housing production and preservation targets in 2020 San Francisco Housing Affordability Strategies⁴⁸ 	-2 -1 +1 +2 N/A	

⁴⁸ Produce an annual average of 5,000 new homes a year, with at least 1,667 homes affordable at very low-, low-, and moderate-incomes. Preserve 600-700 units of existing subsidized affordable housing per year, and preserve 400 apartments serving low- and moderate-income renters annually through acquisition of rent-controlled housing (Small Sites program)

Strategy:					
Theme	Impact Area	Key Statement	Examples of Progress*	Scale (orange=current ; green=potential)	Equity Considerations
	Anti-Displacement	This strategy helps BIPOC, low-income populations, and/or other vulnerable populations** through the lens of intersectionality*** and the businesses and institutions that serve them stay in their neighborhood for the long-term.	<ul style="list-style-type: none"> - Increased percentage of the Black population; maintained or expand percentage of other racial groups that have been decreasing over time (such as Native American/American Indian and Filipino, Samoan, and Vietnamese) - Decreased number of all types of evictions, including illegal evictions and buyouts - Stabilized and reverse the loss of legacy businesses that protect cultural diversity and long-term workers - Tenants' rights education classes held - Foreclosure prevention education/resources 	-2 -1 +1 +2 N/A	
	Access to Services	This strategy helps BIPOC, low-income populations, and/or other vulnerable populations** through the lens of intersectionality*** access essential services.	Proximity or access to schools, grocery stores, workplaces, daycare facilities, community centers, medical facilities, parks/open space	-2 -1 +1 +2 N/A	

Strategy:					
Theme	Impact Area	Key Statement	Examples of Progress*	Scale (orange=current ; green=potential)	Equity Considerations
3. INCLUSION AND EMPOWERMENT	Influence	This strategy acknowledges the expertise that BIPOC, low-income populations, and/or other vulnerable populations** through the lens of intersectionality*** hold about the needs of their communities and includes community expertise in decision-making and implementation.	<ul style="list-style-type: none"> - Identify where the strategy lies on the spectrum of community engagement (see p.2) - Participation at stakeholder meetings, in community councils, etc (depending on where on the spectrum) - Participant surveys to understand efficacy/competency of engagement type (ie # engaged stakeholders who feel they can impact decisions, # engaged stakeholders who feel positively about the program project) 	-2 -1 +1 +2 N/A	
	Social Capital	This strategy strengthens networks and builds capacity and knowledge for BIPOC, low-income populations, and/or other vulnerable populations** through the lens of intersectionality.***	<ul style="list-style-type: none"> - Civic engagement - Awareness of and participation in government and other community-serving programs - Community knowledge of rights - People who volunteer to come together to solve community problems - Membership in community-based organizations and/or faith-based organizations - Social cohesion - Organizations and individuals who gain capacity to address community needs 	-2 -1 +1 +2 N/A	

Strategy:						
Theme	Impact Area	Key Statement	Examples of Progress*	Scale (orange=current ; green=potential)	Equity Considerations	
	Cultural Competence	This strategy is respectful of diverse cultural needs.	<ul style="list-style-type: none"> - Surveying to understand if project/program is culturally competent, process for incorporating feedback - Stabilized and reversed the loss of the city's culture and arts organizations - Stabilized and reversed the loss of legacy businesses that protect cultural diversity and long-term workers 	-2 -1 +1 +2 N/A		
	Equitable Benefits	The benefits of this strategy will be accessible and relevant to BIPOC, low-income populations, and/or other vulnerable populations** through the lens of intersectionality*** and the barriers to receiving the benefits are addressed.	Program/project specific accessibility metrics disaggregated by race where possible	-2 -1 +1 +2 N/A		

Strategy:					
Theme	Impact Area	Key Statement	Examples of Progress*	Scale (orange=current ; green=potential)	Equity Considerations
4. HEALTH	Chronic Disease	This strategy has co-benefits that address prevention and management of chronic disease, particularly for BIPOC, low-income populations, and/or other vulnerable populations** through the lens of intersectionality.***	<ul style="list-style-type: none"> - Cardiovascular Health - Respiratory Health and asthma - Diabetes - Cancer - Obesity 	<p>-2 -1 +1 +2</p> <p>N/A</p>	
	Communicable Disease	This strategy has co-benefits that address prevention or treatment of communicable disease, particularly for BIPOC, low-income populations, and/or other vulnerable populations** through the lens of intersectionality.***	<ul style="list-style-type: none"> - Vector-Borne Disease - Communicable Disease Prevention - Communicable Disease Management 		
	Behavioral Health	This strategy either 1) has co-benefits that address the root causes of mental health triggers, or 2) addresses mental health care, particularly for BIPOC, low-income populations, and/or other vulnerable populations** through the lens of intersectionality.***	<ul style="list-style-type: none"> - Displacement / Financial Insecurity - Violence / Trauma - Maternal and Child Health - Addiction / Substance Abuse - Social Isolation / Community Engagement - Physical Activity / Green Space - Access to Mental Health Services 	<p>-2 -1 +1 +2</p> <p>N/A</p>	

Strategy:					
Theme	Impact Area	Key Statement	Examples of Progress*	Scale (orange=current ; green=potential)	Equity Considerations
	Injury	This strategy has co-benefits that address injury prevention through adaptations to the built environment, particularly for BIPOC, low-income populations, and/or other vulnerable populations** through the lens of intersectionality.***	<ul style="list-style-type: none"> - Road Traffic Injuries - Falls / Household Injuries - Violence - Fire - Poisoning 	-2 -1 +1 +2 N/A	

Strategy:					
Theme	Impact Area	Key Statement	Examples of Progress*	Scale (orange=current ; green=potential)	Equity Considerations
5. HAZARD AND CLIMATE RESILIENCE	Community Adaptation and Resilience	This strategy facilitates programs or policies to improve the ability of BIPOC, low-income populations, and/or other vulnerable populations** through the lens of intersectionality*** to prepare for, respond to, and/or recover from a hazard event.	<ul style="list-style-type: none"> Programs or policies related to: <ul style="list-style-type: none"> - Access to Health Care Services - Access to Emergency Preparedness Programs and Emergency Response Services - Community Engagement, Social Cohesion, and - Cultural Competency - Equitable Recovery 	-2 -1 +1 +2 N/A	
	Physical Environment Resilience	This strategy reduces risks from hazards or exposure to pollution through changes to buildings and/or infrastructure (including nature-based) for BIPOC, low-income populations, and/or other vulnerable populations** through the lens of intersectionality.***	<ul style="list-style-type: none"> Structural improvements related to: <ul style="list-style-type: none"> - Extreme Heat, i.e. Cool Homes/Cool Buildings, Reduces Urban Heat Island - Flooding and Extreme Storms, i.e. Housing Quality / Mold Exposure - Wildfire and Air Quality, i.e. Clean Air / Filtration - Seismic Hazards, i.e. Soft-Story Retrofit Program Reduces Service Disruption - Power Disruption, i.e. Communications Infrastructure, Recovery 	-2 -1 +1 +2 N/A	

Strategy:					
Theme	Impact Area	Key Statement	Examples of Progress*	Scale (orange=current ; green=potential)	Equity Considerations
	Economic Recovery	This strategy supports BIPOC, low-income populations, and/or other vulnerable populations** through the lens of intersectionality*** in the economic recovery from covid-19.	<ul style="list-style-type: none"> - Employment opportunities during covid response prioritized for disadvantaged workers - Training and workforce development prioritized for disadvantaged workers under/unemployed due to covid-19 - Workers receive resources needed for safety and health on the job - Workers receive resources they need to work from home and maintain employment, expanded job types able to work from home - Prioritized financial resources for community-serving small businesses and minority-owned businesses - Prioritized financial resources for community-serving nonprofit organizations 	-2 -1 +1 +2 N/A	

* Some examples are population-level data, and are collected citywide, by zip code, census geography, and/or other geographies. It is difficult to attribute a change in these population-level data to a particular climate action, however connecting climate action to the progress made through a variety of programs is useful. The examples can be used to guide the development of the equity considerations so that recommendations feed into ongoing population-level measurement.

** In addition to the primary focus on communities of color and low-income populations, vulnerable populations are also defined in the document as: older adults, youth, homeless or marginally housed residents, non-English speaking people, immigrants, people with disabilities, people who are socially isolated, and people with pre-existing health conditions

*** Intersectionality refers to the interconnected nature of social categorizations as they apply to a given individual or group, regarded as creating overlapping and interdependent systems of discrimination or disadvantage. When race is intersected with any other disadvantaged social categorization the outcomes for that group or individual are worse.

Resources

KAPWA CONSULTING STAKEHOLDER POWER ANALYSIS TOOL

Stakeholder Power Analysis

Complete this analysis to understand the relative power dynamics between various stakeholders involved in your project and understand specific needs that can be addressed in your stakeholder strategy.

- 1) **Determine what your project question and if the project dynamic is:**
 - a. Process, decision-making oriented: X/Y Variables are Impact/Influence
 - b. Service, program oriented: X/Y Variables are Need/Access

- 2) **Create your stakeholder power analysis chart using the example below:**

(Y axis) Impacted by Decision: Impact is identified by having a positive/negative or missed opportunity to share in the benefit of a Policy or Plan.

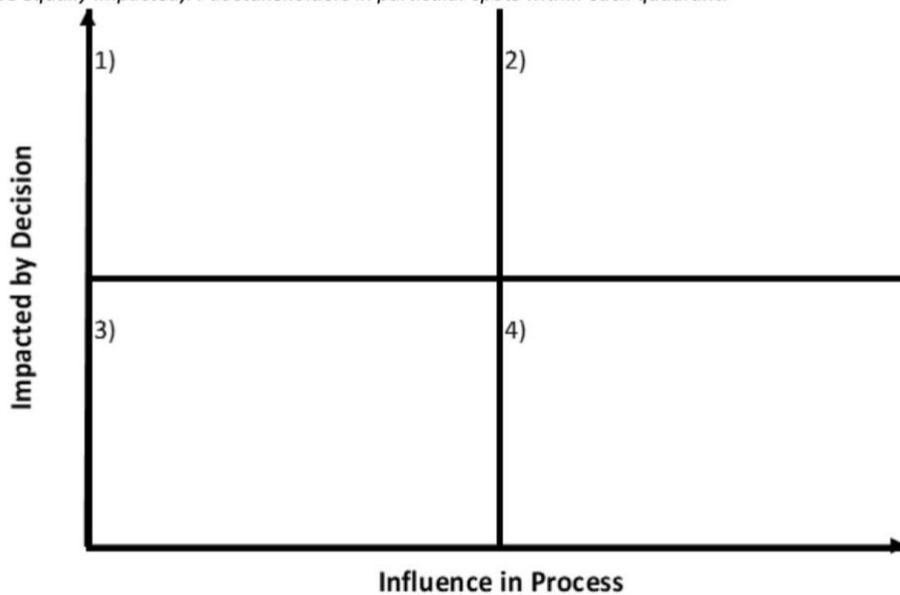
(X axis) Influence in Process: Defined by time, resources, information, familiarity with process and real or perceived ability to influence outcomes.

OR

(Y axis) Need: Level of benefit that can be realized through a program or service or vulnerability to the risks of a problem the project seeks to solve

(X axis) Opportunity/Access: Potential to be advanced (i.e. financially, professionally, in health, or in community well-being). Ability to currently participate or receive the benefits of a program.

Put stakeholders groups in the appropriate quadrant. Break down broad stakeholders groups into sub groups if there are differences in influence or impact within a category (ex. not all small businesses may be equally impacted). Put stakeholders in particular spots within each quadrant.



Key:

Quadrant 1: Highly impacted, little influence: This group should be prioritized for inclusion and equity strategies.

Quadrant 2: Highly impacted, high influence: This group will likely already be at the table. Manage their continued participation, and sharing influence with those in Quadrant 1.

Quadrant 3: Low impact, low influence: This group is not an obvious priority. However, communication should be maintained to honor transparency should they eventually shift into another quadrant.

Quadrant 4: Low impact, high influence: This group should be consulted with for their expertise and influence. Strategies should focus on leveraging power to further advance position of stakeholders in Quadrant 1.

3) Analysis questions

Question 1: Who are the stakeholders impacted by this initiative?

Question 2: Are any of the following groups of stakeholders considered within the initiative, and where do they fall? (You can identify more specific groups within each category)

- Communities of color
- Low-income populations
- Limited English Proficient communities
- Community based organizations and groups
- Interest based organizations and groups
- Churches and faith based groups
- Neighborhood coalitions or associations
- Neighborhood groups
- Property Owners
- Renters
- Business
- Business organizations (associations, chambers of commerce, business districts)
- Employees (unions, non-unionized)
- Institutions (education, health, correctional)
- Local government officials and advisory bodies
- Local government departments
- Tribal sovereign nations
- Other public agencies
- Other stakeholders _____

Question 3: Do certain stakeholder groups carry more influence/access than others in your initiative? Why?

Question 4: What community engagement strategies will you use to ensure under-represented/under-served stakeholders (Quadrant 1) have more equitable influence/access?

SFE RACIAL EQUITY PROGRAM AND POLICY SCAN TOOL

Purpose: Identify existing initiatives and ongoing program work at SF Environment with significant opportunities to advance racial equity. The initiatives and program work identified will be referenced in SFE’s Racial Equity Action Plan and will be prioritized for an in-depth racial equity assessment. **Please complete a worksheet for each major initiative or work area within your Program.** Estimated time to complete: 2 hours.

STEP 0 - General Information	
Program Area	
Name of initiative, policy or ongoing program work	
Brief description. Include background information (why is this happening/a priority?)	
What dedicated financial resources are there? (staff time and/or other)	
STEP 1 - Desired Results/Outcomes	
What is the desired outcome of this initiative? Think about impact.	
STEP 2 - Benefits and Burdens Analysis	
Who is this initiative intended to serve?	
What data do you <i>have</i> to identify who benefits and who is burdened? (include quantitative and/or qualitative data)	

<p>What data do you still <i>need</i> to understand who benefits and who is burdened?</p>	
<p>Who receives the benefits? (Also consider who might benefit financially)</p>	
<p>What are barriers to accessing the benefits?</p>	
<p>Who is/could be burdened?</p>	
<p>What are/could be the unintended consequences?</p>	

STEP 3 – Stakeholder Power Analysis

<p>3a. Who are the stakeholders impacted by this initiative? (check all that apply)</p>	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Communities of color <input checked="" type="checkbox"/> Low-income populations <input checked="" type="checkbox"/> Unhoused populations <input checked="" type="checkbox"/> Limited English Proficient communities <input checked="" type="checkbox"/> Community based organizations and groups <input checked="" type="checkbox"/> Interest based organizations and groups <input checked="" type="checkbox"/> Churches and faith-based groups <input checked="" type="checkbox"/> Neighborhood coalitions or associations <input checked="" type="checkbox"/> Neighborhood groups—through Next Door <input checked="" type="checkbox"/> Property Owners <input checked="" type="checkbox"/> Renters <input checked="" type="checkbox"/> Businesses <input checked="" type="checkbox"/> Business organizations (associations, chambers of commerce, business districts) <input checked="" type="checkbox"/> Employees (unions, non-unionized) <input checked="" type="checkbox"/> Institutions (education, health, correctional) <input checked="" type="checkbox"/> Local government officials and advisory bodies <input checked="" type="checkbox"/> Local government departments
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	<input checked="" type="checkbox"/> Tribal sovereign nations <input checked="" type="checkbox"/> Other public agencies <input checked="" type="checkbox"/> Other stakeholders _____
3b. Who is involved in major decisions? Do certain stakeholder groups carry more influence/access than others in your initiative? Why?	
3c. Where does this initiative lie on the spectrum on community engagement?	
3d. Was community engagement conducted when the initiative was started? Why or why not?	
3e. Was community engagement conducted on an ongoing basis? Why or why not?	

STEP 4 - Strategies for Racial Equity

How might you remove barriers for those who have been unable to access benefits?	
How might you remove or mitigate burdens and unintended consequences?	
What community engagement strategies will you use to ensure low-income communities of color have more equitable influence/access?	
What tools and/or actions are available to achieve the strategies described above?	

STEP 5 – Racial Equity Implementation	
How can we implement these strategies?	
What resources might be needed?	
What additional data or community engagement is necessary?	
STEP 6 – Racial Equity Communications & Accountability	
How would you evaluate and report back on progress towards meeting desired racial equity outcomes?	
Is there a way to receive and incorporate feedback about the program?	

FACILITATING POWER SPECTRUM OF COMMUNITY ENGAGEMENT⁴⁹

	0	1	2	3	4	5
	IGNORE	INFORM	CONSULT	INVOLVE	COLLABORATE	DEFER TO
Stance towards community						
Impact	<i>Marginalization</i>	<i>Placation</i>	<i>Tokenization</i>	<i>Voice</i>	<i>Delegated Power</i>	<i>Community Ownership</i>
Community Engagement Goals	Deny access to decision-making processes	Provide the community with relevant information	Gather input from the community	Ensure community needs and assets are integrated into process & inform planning	Ensure community capacity to play a leadership role in implementation of decisions	Foster democratic participation and equity through community-driven decision-making; Bridge divide between community & governance
Message to community	“Your voice, needs & interests do not matter”	“We will keep you informed”	“We care what you think”	“You are making us think, (and therefore act) differently about the issue”	“Your leadership and expertise are critical to how we address the issue”	“It’s time to unlock collective power and capacity for transformative solutions”
Activities	Closed door meetings Misinformation Systematic disenfranchisement Voter suppression	Fact sheets Open Houses Presentations Billboards Videos	Public comment Focus Groups Community Forums Surveys	Community organizing & advocacy House Meetings Interactive Workshops Polling Community forums	MOU’s with Community-Based Organizations Community Organizing Citizen Advisory Committees Open Planning Forums with Citizen Polling	Community-Driven Planning Consensus building Participatory Action Research Participatory Budgeting Cooperatives
Resource allocation ratios	100% systems admin	70-90% to systems admin 10-30% to promotions and publicity	60-80% to systems admin 20-40% to consultation activities	50-60% to systems admin 40-50% to community involvement	20-50% to systems admin 50-70% to community partners	80-100% to community partners and community-driven processes that ideally generate new value and resources that can be invested in solutions

⁴⁹ https://www.facilitatingpower.com/spectrum_of_community_engagement_to_ownership

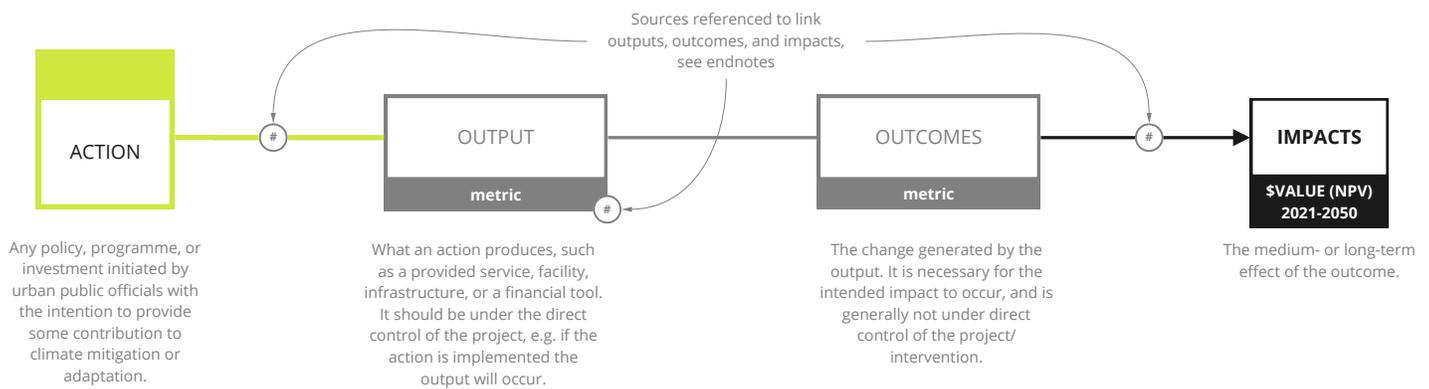
THE SOCIOECONOMIC VALUE OF CAP COMMUNITY BENEFITS

APPENDIX E

APPENDIX E: SOCIOECONOMIC VALUE OF CAP COMMUNITY BENEFITS

The goals of the Climate Action Plan (CAP) are to chart an actionable path to achieve net zero greenhouse gas (GHG) emissions by 2050, advance racial and social equity, and protect the entire San Francisco community from the impacts of climate change. Because the activities that produce GHG's and lead to climate change (primarily burning fossil fuels) also tend to also produce other negative consequences, reducing GHG's can also create other benefits, often referred to as "co-benefits" or "co-impacts." For example, reducing fossil-fuel based automobile use that generates GHG emissions also reduces other air pollutants such as nitrogen oxides (NOx), sulfur oxides (SOx), and fine particulate matter (PM) that cause health problems, which can be measured in quantifiable avoided healthcare costs. Reducing automobile use by switching travelers to active modes of transportation such as biking and walking provides even more additional benefits by improving individual health, which can be measured with even more quantifiable avoided healthcare costs.

A growing body of research over the past fifteen years has begun to quantify these additional costs and benefits of climate action. The [C40 network of cities](#), of which San Francisco is an active member, has developed a framework for identifying and categorizing these co-benefits in a way that is transparent, reproducible, and avoids double-counting. [see endnote 1] It requires clearly identifying the actions being planned, the outputs that an action would create, the resultant outcomes, and the impacts (costs and benefits) those outputs could have on the population. While this approach is global in scale, local data is necessary to apply it, as the same actions applied in different places may have different outputs, outcomes, and impacts. This study uses the C40 methodology to study selected supporting actions of the San Francisco CAP to identify costs and benefits.



This quantitative approach is generally linear, in that it takes inputs specific to San Francisco (e.g. the population of the city) and the CAP (e.g. number of new acres of open space planned), and multiplies them by impact factors derived from published research. Many of the inputs are derived from the "Focus 2030" report, which was developed by the San Francisco Department of the Environment to identify pathways to the CAP goal of reaching zero emissions by 2050. [see endnote 2] The impact factors come from a range of published sources that are noted on each impact pathway and can be found in the endnotes. To the degree that some of co-benefits identified appear large, they are scaled according to the targets of the CAP, which are correspondingly large: for instance, switching up to 6% of all vehicle trips in San Francisco to bicycling, and completely eliminating natural gas usage in residential and commercial buildings. This approach was aligned with available research and was therefore limited to studying CAP actions for which there are accepted methodologies for monetizing benefits; many other CAP actions would also provide significant community benefits that cannot currently be estimated, but are nonetheless valuable. Also, the current methodologies do not account for how co-benefits might vary across the community by race, class or other factors -- this refinement of the methodology should be a priority for future study in this area.

These findings show that implementing the CAP will save money, save lives, reduce illness and injury, and avoid healthcare costs to City residents and businesses. CAP actions in the Building Operations sector can reduce utility costs which will make living in San Francisco more affordable, while certain Healthy Ecosystems actions can generally have a positive effect on property values. However, like all proposed actions in the CAP, they must be implemented with a commitment to equity and inclusive decision making to ensure protections for vulnerable populations, prevent undue financial burdens on low-and-middle income families, preclude displacement and evictions, and avoid other unintended consequences. If done correctly, implementing just a subset of actions from the CAP has the potential to generate community benefits that exceed \$1 billion in value and increase the quality of life for all San Franciscans.

COMMUNITY BENEFITS SUMMARY

The community benefits of the Climate Action Plan detailed on the following pages added together total over \$2.7 Billion, especially due to the avoided deaths from eliminating natural gas use in buildings. The dollar value is expressed as net present value (2021 dollars) over the 30 year period of the CAP using a discount rate of 3%. [see endnote 1]

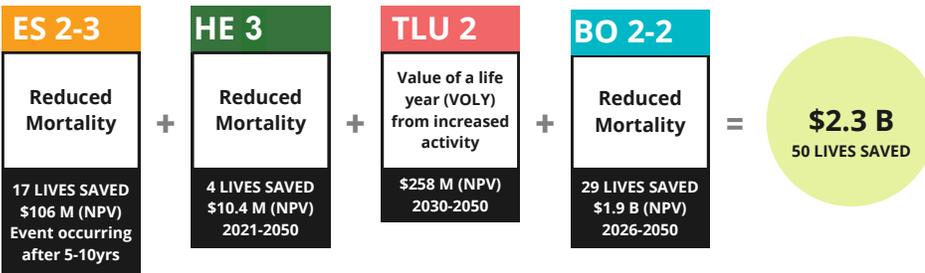
Reduced Morbidity / Reduced Social Costs

Morbidity refers to the rate of illness in a population. Social costs refer to negative impacts to society expressed in dollar terms, such as the health impacts of air pollution. The financial benefits shown here are avoided costs for health care related to treating injuries and conditions like asthma and stroke that have environmental sources.

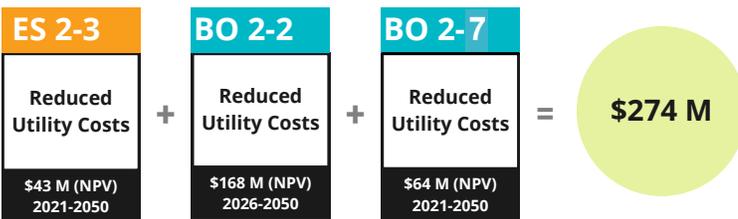


Reduced Mortality

Morbidity refers to the rate of deaths in a population.



Reduced Utility Costs

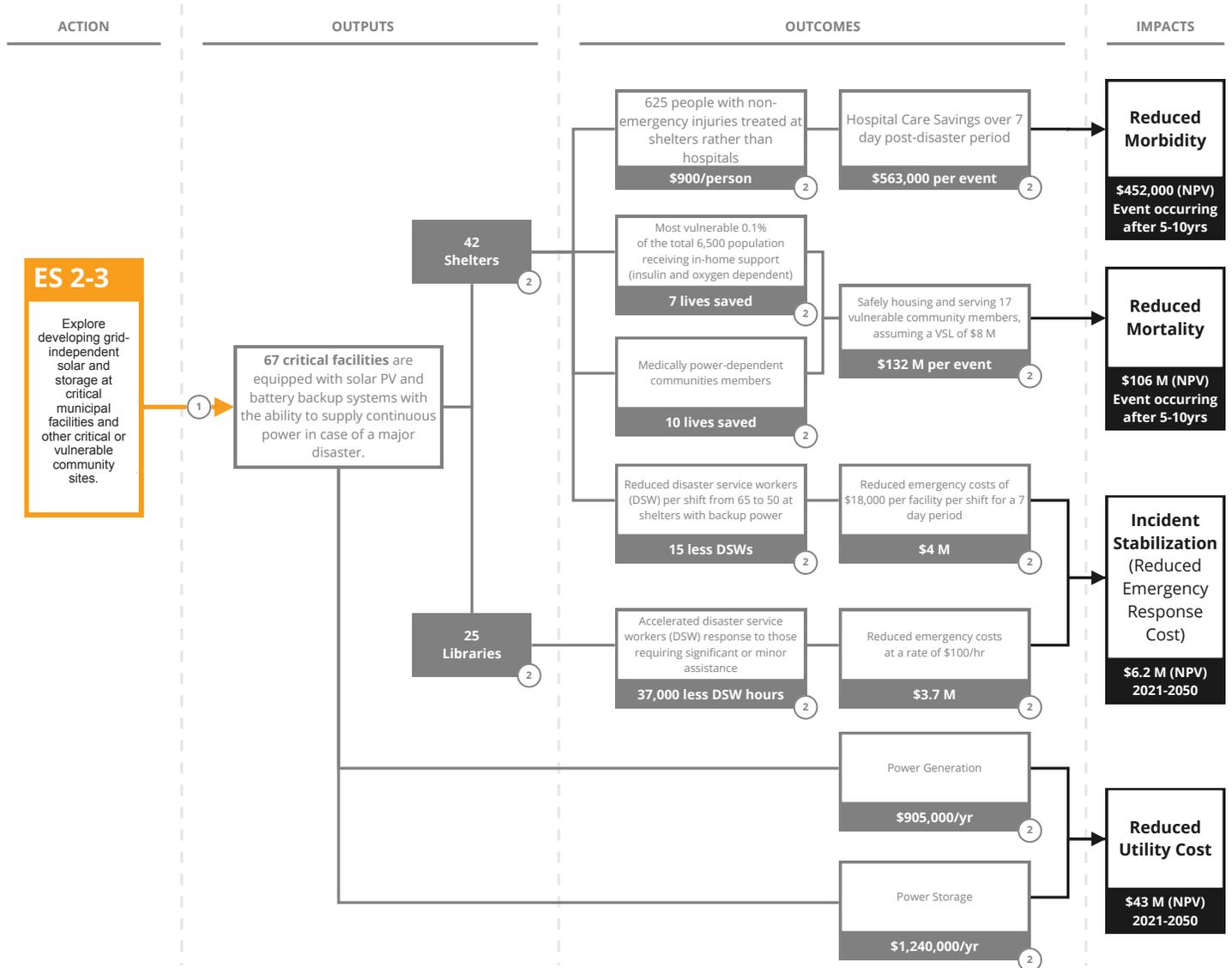


Additional Savings



ENERGY SUPPLY (ES)

ES 2: Invest in local renewable energy and energy resilience projects where safe and affordable.



Improving the availability of community buildings to serve as emergency shelters offers safe housing and service to power-dependent and vulnerable populations, avoiding the loss of life and hospital admissions for non-emergency injuries that would occur without safe housing. In addition, installing solar power and battery backup systems at these critical facilities will accelerate disaster relief response time, resulting in a less expensive disaster response. The value of the benefits due to avoided disasters is calculated assuming an event would occur between 5-10 years after installation. Outside of emergency situations, the solar power generation produces valuable clean electricity and the battery backup reduces peak demand charges and earns grid service credits. However, avoided use of diesel generators during an emergency event to supply an equivalent amount of power, and the social costs of the associated air pollution that would occur, are not included in the source calculations. See the referenced sources for more detail on the definition and selection of critical facilities studied for this co-benefit pathway (San Francisco has more than 67 critical facilities overall).

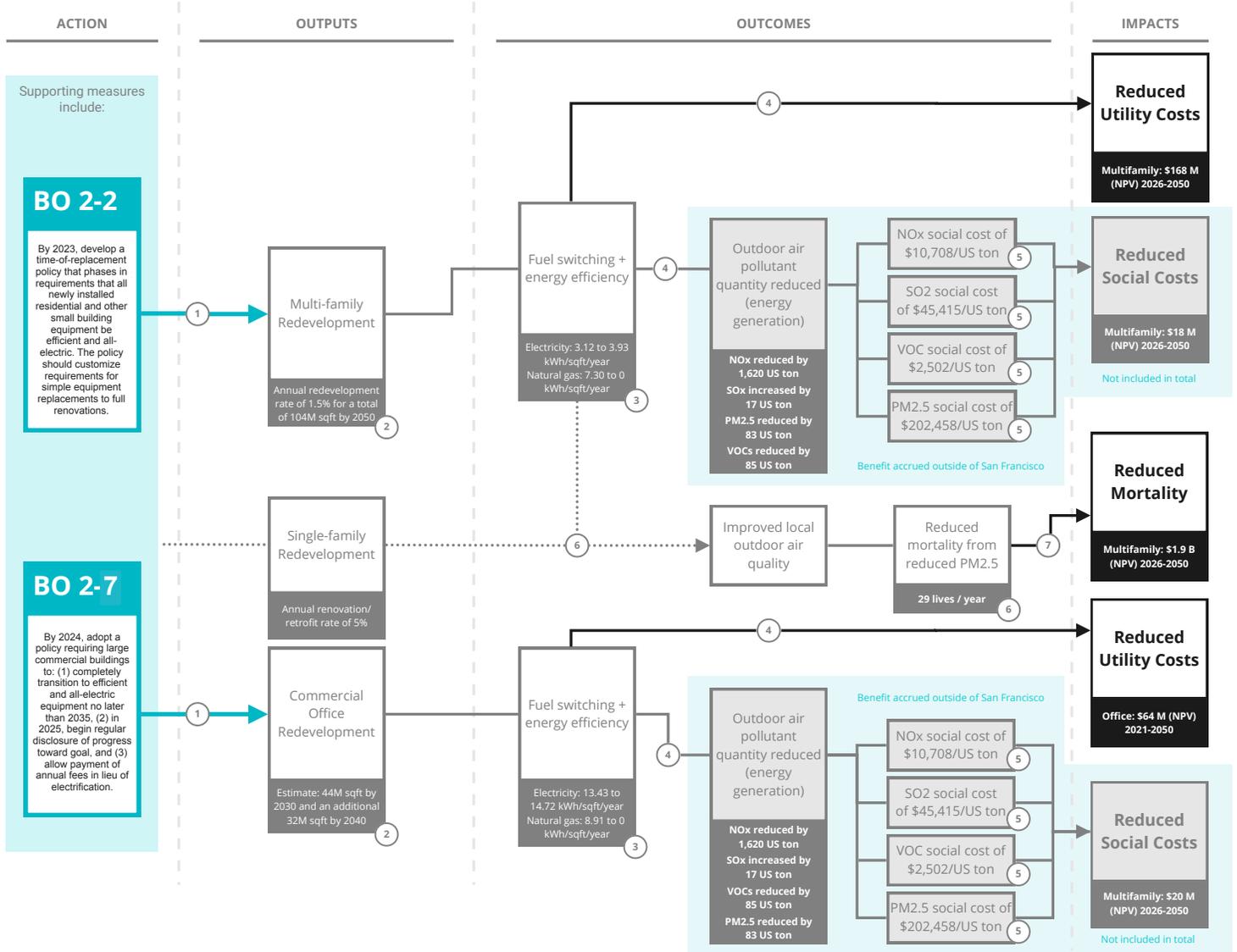
CO-BENEFITS

- Reduced Morbidity**
\$452,000 (NPV) per 7-day post disaster period
- Reduced Mortality**
\$106 M (NPV) 17 lives saved per major disaster
- Incident Stabilization**
\$7.7 M (NPV) Disaster service workers' hours reduced by 37,000
- Reduced Utility Cost**
\$43 M (NPV) ongoing savings from on-site solar and battery backup

TOTAL \$156 M

BUILDING OPERATIONS (BO)

BO 2: Eliminate fossil fuel use in existing buildings by tailoring solutions to different building ownership, systems, and use types.



Requiring new equipment in buildings -- water heaters, furnaces, stoves, etc. -- to be all-electric will result in a phase out of natural gas appliances over time as equipment wears out or is upgraded. In addition, replacement requires equipment to meet current energy codes, which require greater energy efficiency than existing equipment typically has. The benefits of this transition include reduced utility costs for building owners and tenants and improved local air quality. Due to source limitations, utility cost savings could only be estimated for commercial office and multifamily building types (and do not include all likely cases of equipment replacement), while air quality impacts were modeled for single- and multi-family residential buildings (but not commercial or institutional buildings), resulting in a conservative underestimate of total benefits.

Reducing energy use also reduces the air pollutants that are byproducts of electricity generation from natural gas production. However, because no natural gas power plants operate within San Francisco, these additional benefits (gray boxes) accrue outside the boundaries of San Francisco; the benefits are calculated but not added to the total value.

CO-BENEFITS

Reduced Utility Costs
\$231 M (NPV)
for multi-family and office redevelopment by fuel switching and increased efficiency, accruing until and including 2050*

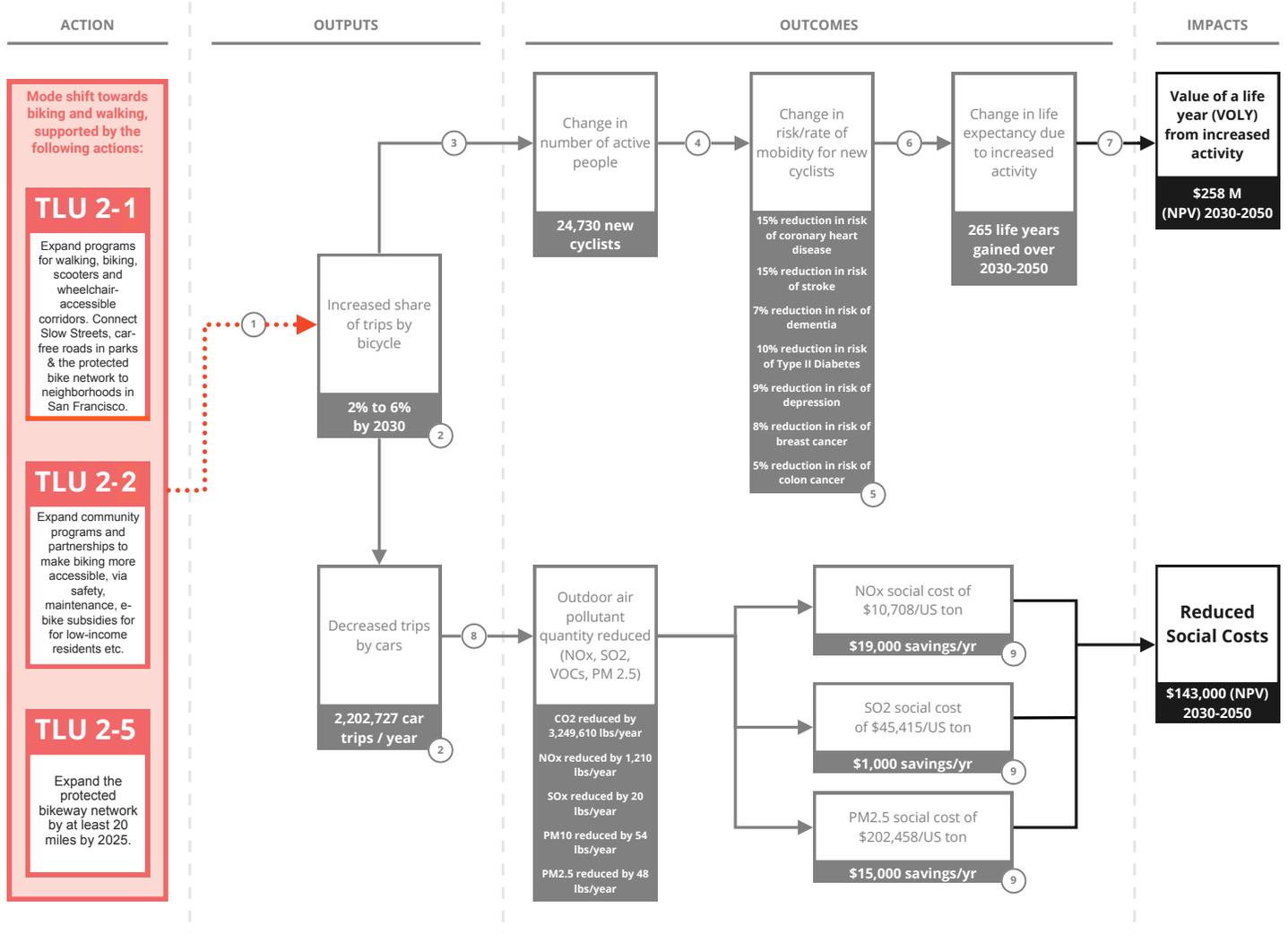
Reduced Mortality
\$1.9 B (NPV)
29 lives saved from improved air quality in San Francisco (reduce PM2.5)

TOTAL
\$2.1 B

* Assumes space cooling stays unchanged and heating switches from gas to electric.

TRANSPORTATION & LAND USE (TLU)

TLU 2: Create a complete and connected active transportation network that shift trips from driving to walking, biking, and other low-carbon modes.



Achieving the CAP's Transportation sector goal of 80% of trips via sustainable modes by 2030 would result in many people switching from single occupant vehicles to biking, walking, and transit use (i.e. transportation "mode shift"). This page calculates some of the community benefits that would be associated with the active transportation mode increases (e.g. more bicycling) needed to achieve the 80% sustainable trips goal and highlights a few of the supporting actions, like expanding the existing protected bicycle lane network within the city. There is no concrete link between the specific supporting actions and the mode shift; the methodology here relies on the CAP goals to determine the magnitude of the mode shift and then monetizes some of the health and social benefits of this shift; it does not attempt to quantify the link between the specific CAP strategies and the mode shift. Because the mode shift goal is set for 2030 in the CAP, the benefits are evaluated starting in 2030 up to the goal year 2050.

There are significant health benefits associated with the increased physical activity due to more people using active transportation: reducing mortality and mitigating the risk of diabetes mellitus, ischemic heart disease, ischemic stroke, Alzheimer disease and other dementias, depression, breast cancer, and colon cancer. These health benefits also lead to directly avoided healthcare costs for the people being active. In addition, the transportation mode shift would improve air quality in San Francisco through reducing other pollutants like CO2, NOx, SO2, PM10 and PM2.5, which in turn would have health benefits for the larger San Francisco community and lead to additional avoided healthcare costs. This study did not estimate the impact that decreasing the number of vehicles on the road and increasing the number of protected bike lanes would have on the number of vehicle crashes and related costs.

CO-BENEFITS

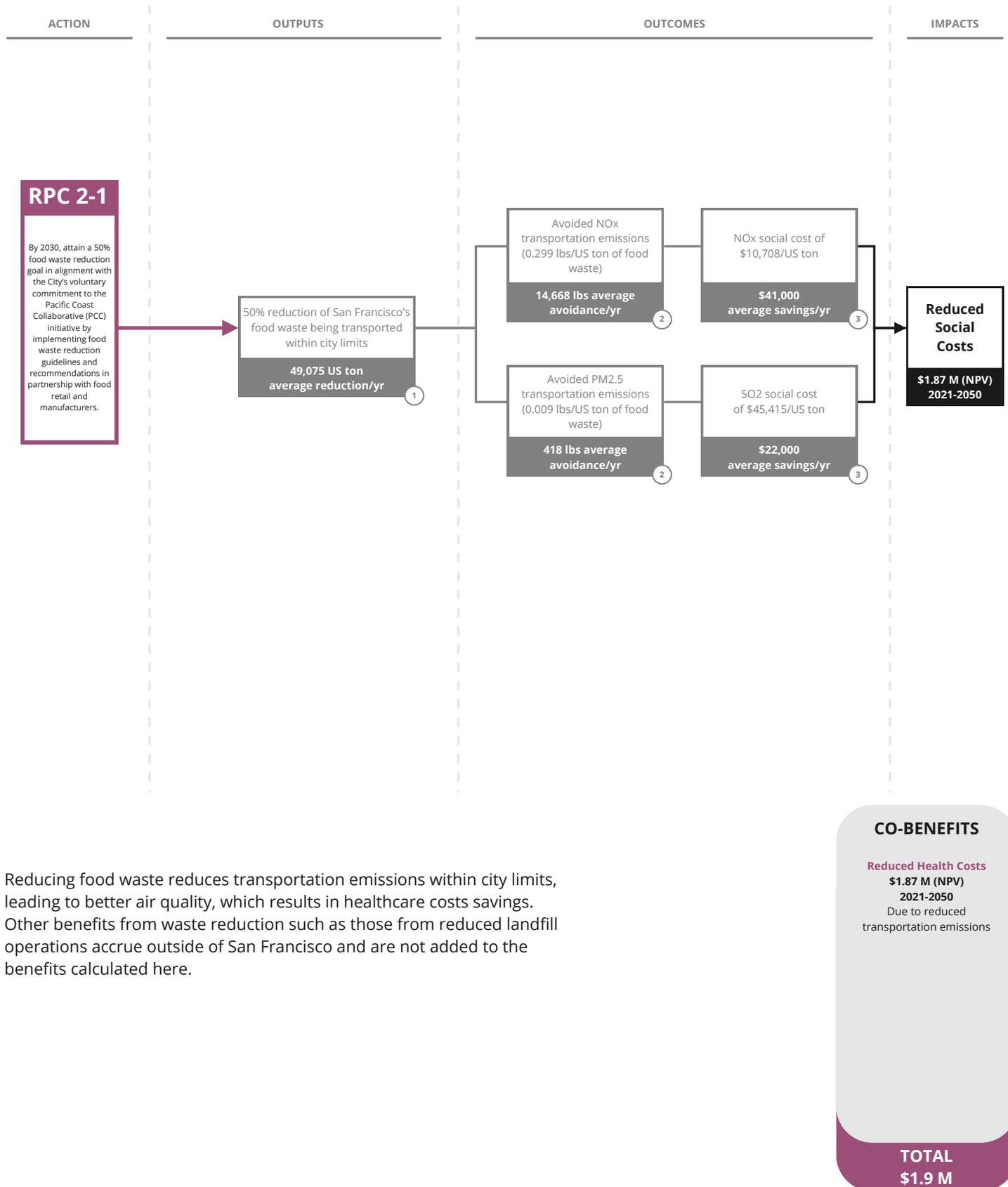
Savings over project life (VOLY) due to increased activity
\$258 M
The mode shift towards active transport leads to significant health outcomes for new cyclists

Reduced social costs due to reduced emissions
\$143,000
Fewer cars on the road means reduced air pollution

TOTAL
\$258 M

RESPONSIBLE PRODUCTION AND CONSUMPTION (RPC)

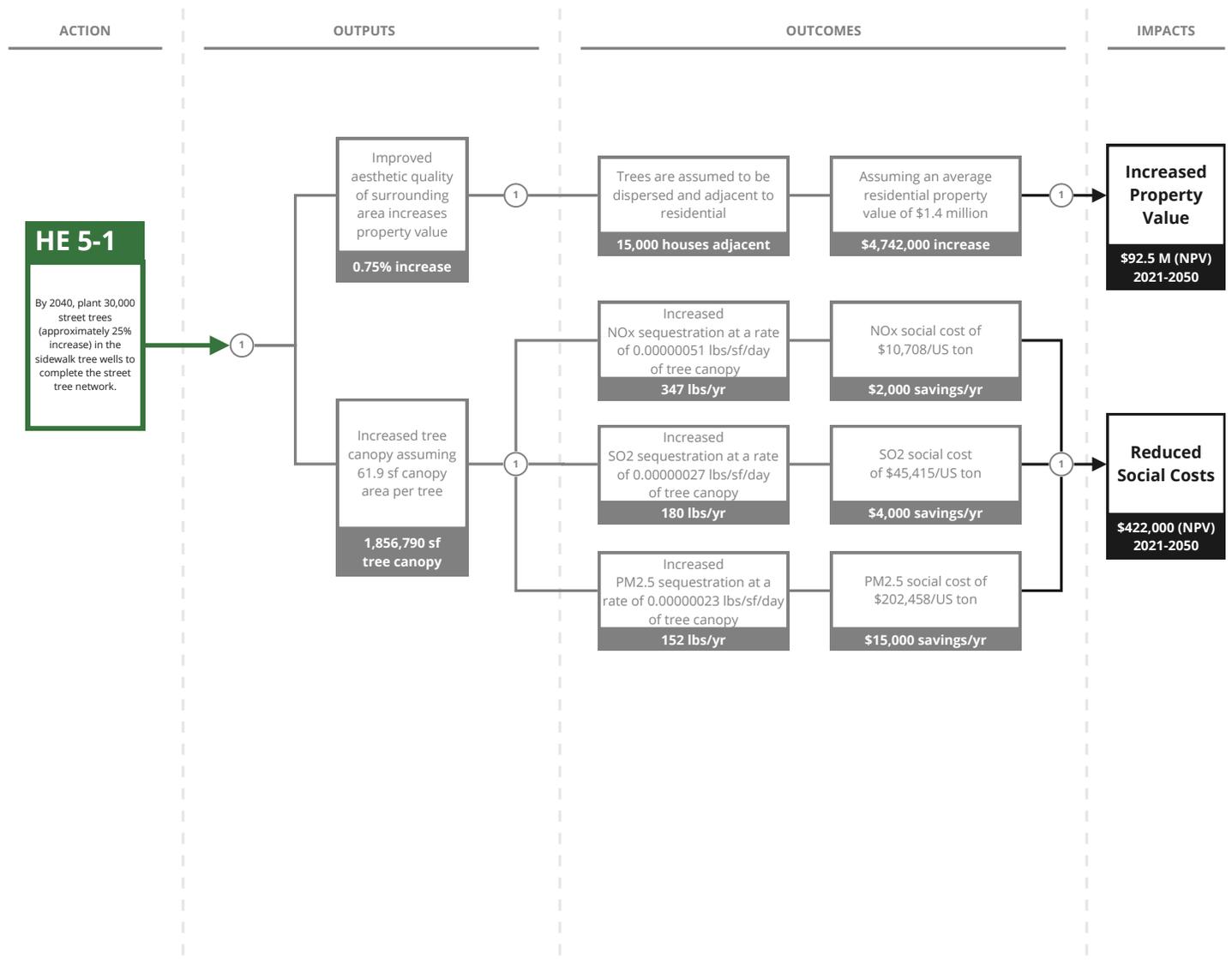
RPC 2: Reduce the carbon footprint of the food system by reducing waste, promoting climate friendly diets, and getting excess food to communities in need.



Reducing food waste reduces transportation emissions within city limits, leading to better air quality, which results in healthcare costs savings. Other benefits from waste reduction such as those from reduced landfill operations accrue outside of San Francisco and are not added to the benefits calculated here.

HEALTHY ECOSYSTEMS (HE)

HE 5: Maximize trees and other urban greening throughout the public realm.



Planting 30,000 street trees will increase tree canopy, which will remove particulate matter that pollutes the air, resulting in reduced healthcare costs. Street trees also increase the property values of adjacent parcels, an effect which can accrue to property owners as well as tenants staying in higher quality spaces. Because of the existing and worsening wealth and income inequity in San Francisco, measures that increase property value should be evaluated for potential impact on displacement and income inequality.

The increased property value reported is the average of the estimated range of \$20 M - \$165 M, which is driven by the range of percent property value increase due to trees and the range of the number of houses that would be impacted by the action.

CO-BENEFITS

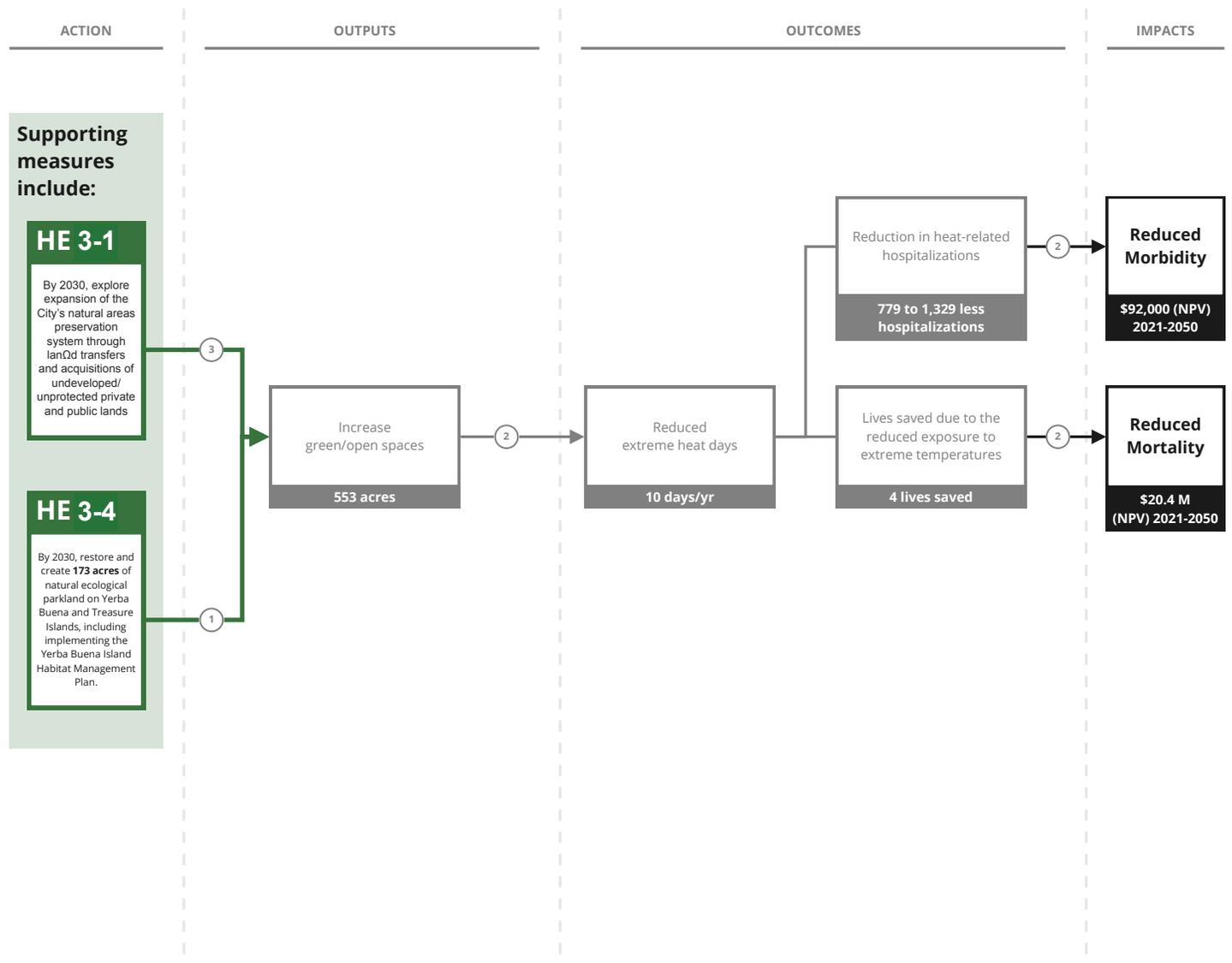
Increased Property Values
\$92.5 M (NPV)
2021-2050

Reduced Health Costs
\$422,000 (NPV)
2021-2050

TOTAL
\$93 M

HEALTHY ECOSYSTEMS (HE)

HE 7: Restore and enhance parks, natural lands and large open spaces.



Increasing San Francisco's green spaces reduces the number of extreme temperature days per year, ultimately reducing the number of heat-related hospitalizations and deaths. This effect is relatively small in San Francisco due to the City's very moderate climate; other cities with more extreme heat days would see a larger impact per acre of green space. Benefits were modeled using the C40 Cities estimation tool, which factors in the impacts of climate change. The intensity of climate change scenarios from moderate to severe gives a corresponding range of heat-related hospitalizations depending on the intensity of CO2 increase (i.e. which representative concentration pathways is used to estimate climate change.) This study used all 4 climate change scenarios (RCP values) in the C40 tool and averaged the results.

CO-BENEFITS

Reduced Morbidity
\$92,000 (NPV)
 due to decreased heat-related hospitalizations between 2021-2050

Reduced Mortality
\$20.4 M (NPV)
 4 lives saved between 2021-2050

TOTAL
\$20.5 M

ENDNOTES

Ref	Notes	Source
INTRODUCTION		
1	C40 Cities Co-benefits Framework	"Urban Climate Action Impacts Framework: A Framework for Describing and Measuring the Wider Impacts of Urban Climate Action," C40 Cities / Ramboll, 2020, https://www.c40.org/research
2	Focus 2030: A Pathway to Net Zero Emissions	"Focus 2030: A Pathway to Net Zero Emissions," City of San Francisco, Department of the Environment, July 2019: 1-44, https://sfenvironment.org/sites/default/files/fliers/files/sfe_focus_2030_report_july2019.pdf
COMMUNITY BENEFITS SUMMARY		
1	Net present value: the value of a future amount of money in today's dollars, recognizing that money received in the future is not worth as much as an equal amount received today	
ES 2-3		
1	Critical facilities: Number of critical facilities equipped with solar PV and battery backup modeled in the San Francisco Resilient Solar and Storage Roadmap.	"Resilient Solar and Storage Roadmap, City of San Francisco, Department of the Environment, 2017: 1-76, https://sfenvironment.org/sites/default/files/fliers/files/sfe_ee_solar_storage_roadmap.pdf
2	Co-benefits: Estimation of benefits including reduced morbidity, mortality, emergency costs, and utility costs studied in the Solar and Energy Storage for Resiliency report.	"Solar and Energy Storage for Resiliency," City of San Francisco, Department of the Environment, 2018: 1-48, https://sfenvironment.org/sites/default/files/fliers/files/sfe_en_solar_resilient_cost_benefit_analysis.pdf
BO 2-2 & 2-7		
1	Building Areas: Square footages for multi-family and commercial office redevelopment are from SF "Focus 2030" report supporting calculations.	"Focus 2030: A Pathway to Net Zero Emissions," City of San Francisco, Department of the Environment, July 2019: 1-44, https://sfenvironment.org/sites/default/files/fliers/files/sfe_focus_2030_report_july2019.pdf
2	Renovation Rate & Timescale: This calculation is based on a phased retrofit scenario, where 1.5% of the existing multi-family building stock is renovated each year such that all building systems are replaced with efficient, all-electric equals. This is conservative because it does not account for the benefits accrued from retrofits of existing building stock where only some natural gas systems are replaced or improved (e.g., natural gas boiler replaced with electric water heater, but furnace still on natural gas). To align with other benefit calculations, this calculation counts benefits accrued between 2026 to 2050.	
3	Energy Use & Fuel Share Shift: The impact of a transition from business as usual (BAU) energy use intensity (EUI) to redevelopment EUI for multi-family and commercial office respectively was modeled. The EUI rates were drawn from the SF "Focus 2030" report.	"Focus 2030: A Pathway to Net Zero Emissions," City of San Francisco, Department of the Environment, July 2019: 36, https://sfenvironment.org/sites/default/files/fliers/files/sfe_focus_2030_report_july2019.pdf
4	Air Pollution & Energy Costs: Pollutant reduction per fuel type is simulated through Autocase; reduction draws on National Emissions Inventory in the U.S (EPA, 2014). This air pollution is the by-product of energy generation. Energy costs are also applied from Autocase, based on information from the U.S. Energy Information Administration.	Autocase, 2021. https://autocase.com/
5	Social Costs per Air Pollutants: Social costs are applied through Autocase. Autocase uses a location-specific factor, derived from available research publication and regression tools, to estimate financial impacts on: local occupant health, visibility, crop health and damages to properties. This is not included in the final sum because benefits accrue outside of the City and County of San Francisco.	Autocase, 2021. https://autocase.com/
6	Local Air Pollution: Combustion appliances (e.g. natural gas stoves) emit a variety of air pollutants. These are emitted within the home and then eventually flow outdoors and are linked to negative health consequences. This calculation uses the 2020 UCLA study of electrification of domestic appliances, which reports the mortality associated with the <i>outdoor</i> air pollution from domestic appliances for California counties. The value for reduced mortality in San Francisco in a single year as consequence of reduced outdoor PM2.5 was applied across years 2026 to 2030. The UCLA study assumed full electrification of the existing residential building stock in one year, to be more realistic this calculation used a scenario where 5% of existing equipment (corresponding to an average 20 year service life) is replaced with all-electric new equipment starting in 2026. Note that additional health benefits, most notably 1) the health impacts of <i>indoor</i> exposure to combustion products from gas appliances, and 2) reduced morbidity from respiratory diseases, were not included in the co-benefits value calculated due to limits on the calculations in the source study.	"Effects of Residential Gas Appliances on Indoor and Outdoor Air Quality and Public Health in California," UCLA Fielding School of Public Health Department of Environmental Health Sciences, April 2020: 57, https://ceeh.ph.ucla.edu/effects-residential-gas-appliances-indoor-and-outdoor-air-quality-and-public-health-california
7	Reduce Mortality based on VSL: The value of a statistical life (VSL) used in this calculation was \$8 M. The financial discount rate used was 3%.	
TLU 2		
1	Mode Shift: Estimation of benefits based on assuming that the combined TLU supporting actions achieve a bike share mode split of 6% of total trips by 2030, with benefits accruing to 2050. The 6% factor was taken as the halfway point between the current mode split of 2% and the CAP goal of 10%.	
2	Reduced Car Trips / Year: This is based on the assumption that 3% of single-occupant vehicle trips and 1% of private carpool vehicle trips transition to cycling annually.	
3	Number of Trips / Cyclist: This assumes that, on average, each cyclist bikes 200 trips per year (for example, 10 trips per week for 20 weeks).	
4	Trip Length and Duration: This assumes an average trip length of 4 miles and duration of 25 minutes (for a speed of approximately 9.5 mph). It is assumed people are likely to walk rather than bicycle for trips shorter than 0.62 miles (1 km).	
5	Health Risk Reductions: Morbidity relative risk reduction factors for the various conditions listed are applied through C40 Walking and Cycling Benefits Tool and are sourced from the Integrated Transport and Health Impact Model (ITHIM). The percentages listed in the flow chart result from these values and the estimated minutes of activity per year for the new cyclists.	"Walking and Cycling Benefits Tool," C40 Cities, 2021 https://www.c40.org/benefits
6	Change in Life Expectancy: The change in life expectancy, reported in years gained over the time period evaluated, was calculated through C40 Walking and Cycling Benefits Tool.	"Walking and Cycling Benefits Tool," C40 Cities, 2021 https://www.c40.org/benefits
7	Value of Life Year: \$80,000 was used for the value of a life year (VOLY), per the C40 Walking and Cycling Benefits Tool. This provides a lower financial value for social value of health impacts than the \$8M per death averted used in other calculations. Given the large range of uncertainty in this calculation in particular, the lower estimate was more conservative.	
8	Reduced Air Pollution: The reduction in air pollution from the trips that transition from cars to biking was calculated through C40 Walking and Cycling Benefits Tool.	"Walking and Cycling Benefits Tool," C40 Cities, 2021 https://www.c40.org/benefits
9	Social Costs per Air Pollutants: Social costs are applied from Autocase. Autocase uses a location-specific factor, derived from available research publication and regression tools, to estimate financial impacts on: local occupant health, visibility, crop health and damages to properties.	Autocase, 2021. https://autocase.com/
RPC 2-1		
1	Food Waste Reduction: A 50% food waste reduction by 2030 would result in an annual average reduction of 49,075 in food waste.	"Focus 2030: A Pathway to Net Zero Emissions," City of San Francisco, Department of the Environment, (July 2019): 1-44, https://sfenvironment.org/sites/default/files/fliers/files/sfe_focus_2030_report_july2019.pdf
2	Avoided Transportation Emission Factors: Avoided food waste reduces the total amount of landfill waste and results in a reduction in transportation emissions. NOx is reduced by 0.299 lbs. and PM2.5 is reduced by 0.009 lbs. per US ton of food waste reduced.	"Food Waste Prevention and Rescue Program: Quantification Methodology," California Department of Resources Recycling and Recovery (September 2020): 1-14, https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/calrecycle_finalfoodcalc_19-20.xlsx
3	Social Costs per Air Pollutants: Social costs are applied through Autocase. Autocase uses a location-specific factor, derived from available research publication and regression tools, to estimate financial impacts on: local occupant health, visibility, crop health and damages to properties.	Autocase, 2021. https://autocase.com/
HE 5-1		
1	Increased Property Value & Reduced Social Costs: Planting 30,000 street trees will increase aesthetic quality and overall tree canopy resulting in increased property value and increased air pollutant sequestration.	Autocase custom report, see Appendix
HE 3-1		
1	Natural Ecological Parkland: The Yerba Buena Island: Habitat Management Plan provides recommendations for ecological parkland restoration.	"Yerba Buena Island: Habitat Management Plan," Treasure Island Community Development, 2001 https://sf-treasureisland.org/sites/default/files/110307-HMP.pdf
2	Reduced Extreme Heat Days: C40 Cities Heat Resilient Cities Benefits tool is used to determine the reduction in extreme heat days and calculate the impacts.	"Heat Resilient Cities Benefits Tool," C40 Cities, 2020 https://www.c40.org/benefits
3	Undeveloped / Unprotected Private and Public Lands: see the San Francisco Unprotected Lands - Interactive Web Map	https://sf.gov.maps.arcgis.com/apps/PublicInformation/index.html?appid=b34952c23aec417fb629a0e3ac05c702

CAP JOB CREATION POTENTIAL

APPENDIX F



APPENDIX F: Employment Impacts Analysis of San Francisco’s Climate Action Plan: Methodology and Assumptions

This memo describes the approach used to estimate jobs corresponding to key actions in the San Francisco Climate Action Plan (CAP). All jobs reported are “direct” jobs. Including indirect jobs (supply chain) and induced jobs (created from the spending of labor income) would increase the employment impact by 30 - 50%.

Summary

Many of the new jobs created and supported by San Francisco’s CAP are related to the construction industry. Quality apprenticeship readiness programs that provide support services for trainees to access career-track training and employment opportunities, along with registered apprenticeships are excellent training pathways that can continue to improve access and inclusion in the construction trades for underserved and under-represented workers.

Efficient and All Electric Buildings

BO 2: Eliminate Fossil Fuel Use in Existing Buildings

To estimate jobs related to the decarbonization of existing buildings, Inclusive Economics used its building decarbonization jobs model. The model is based on the following inputs and sources. Total costs are translated into jobs using [IMPLAN](#)¹ multipliers, customized by type of work and building sector.

1. San Francisco Building Stock Summary

San Francisco building stock data was obtained from the San Francisco Department of the Environment. This data is shown in Table 1 and Table 2.

TABLE 1. RESIDENTIAL BUILDINGS

Sector	Description	Number of Units	Number of Buildings
Single Family	detached, townhouses, mobile homes	124,111	124,111
Small Multi-Family	<50,000 sq ft	118,000	31,500

¹ IMPLAN, which is short for “impact analysis for planning,” is a company that was originally created by academics to serve the needs of the United States Forest Service. Since then, it has been transformed to serve as a solution-provider for organizations interested in understanding their economy.



Large Multi-Family	>50,000 sq ft	153,000	5,300
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TABLE 2. NON-RESIDENTIAL BUILDINGS

Sector	Description	Million Sq Ft	Number of Buildings
Small & Medium	<50,000 sq ft	69	15,423
Large	>50,000 sq ft	215	1,795

2. Market Analysis, Including Gas Saturation

Present-day gas saturation data for building end uses (i.e. appliances or equipment) was obtained from the Residential Appliance Saturation Survey (RASS)². Results from the 2019 RASS and 2020 CEUS were not yet available at the time this analysis was conducted. Gas saturation by end use is summarized in Table 3.

TABLE 3. MARKET POTENTIAL

Sector	Type	Efficiency Improvements Assumed	Fossil Fuel Water Heating	Fossil Fuel Space Heating	Fossil Fuel Cooking	Fossil Fuel Clothes Drying	Panel/Service Upgrade Assumed
Residential	Single Family	95%	96%	92%	75%	44%	20%
Residential	Small Multi-Family	95%	90%	86%	61%	17%	40%
Residential	Large Multi-Family	95%	43%	53%	35%	9%	40%
Non-Residential	Small & Medium	95%	56%	56%	34%	0%	45%
Non-Residential	Large	75%	49%	67%	8%	0%	45%

3. Investment Costs and Distribution of Costs

Efficiency and electrification costs were obtained from a wide range of sources including published literature, case studies, construction cost estimators, and interviews with industry professionals. In addition to total upfront costs, analysts gathered information on the marginal costs of replacing gas with electric appliances. The residential cost estimates are provided in Table 4 and the non-residential costs are provided in Table 5. The analysis then looked at how costs were distributed, not only between equipment, labor, and overhead, but also to account for different types of work, corresponding to different trades.

TABLE 4. GROSS INVESTMENT COSTS, RESIDENTIAL SECTOR

	Single Family			Small Multi-Family			Large Multi-Family		
	low	high	Per unit	low	high	Per unit	low	high	Per unit
Efficiency 15-30%	\$8,200	\$12,200	unit	\$7,200	\$10,200	unit	\$6,600	\$9,200	unit

² 2018 RASS was conducted by DNV-GL and Commercial End Use Survey (CEUS) conducted by Itron, under the direction of the California Energy Commission.



Space Heating/Cooling Electrification	\$19,500	\$20,500	unit	\$9,000	\$11,000	unit	\$11,600	\$12,200	unit
Water Heating Electrification	\$3,000	\$3,100	unit	\$1,180	\$2,740	unit	\$890	\$1,180	unit
Dryer Electrification	\$1,000	\$1,800	unit	\$1,300	\$2,600	building	\$1,300	\$2,600	building
Cooking Electrification	\$1,400	\$2,900	unit	\$1,400	\$2,900	unit	\$1,400	\$2,900	unit
Gas Disconnection	\$400	\$600	unit	\$600	\$800	building	\$600	\$800	building
Panel upgrades	\$4,400	\$4,500	unit	\$11,540	\$89,600	building	\$179,200	\$281,000	building

TABLE 5. GROSS INVESTMENT COSTS, NON-RESIDENTIAL SECTOR

	Small			Large		
	low	high	Per	low	high	Per
Efficiency 15-30%	\$9	\$12	sq ft	\$13	\$16	sq ft
Space Heating/Cooling Electrification	\$4	\$11	sq ft	\$19	\$28	sq ft
Water Heating Electrification	\$1	\$1	sq ft	\$0	\$1	sq ft
Misc. Electrification	\$2	\$2	sq ft	\$2	\$2	sq ft
Cooking Electrification	\$16	\$20	sq ft of kitchen space	\$16	\$20	sq ft of kitchen space
Gas Disconnection	\$800	\$1,000	building	\$1,200	\$1,600	building
Panel upgrades	\$20,000	\$40,000	building	\$68,000	\$128,000	building

4. Employment Multipliers

Off-the-shelf economic models do not work well for building decarbonization. While IMPLAN includes 542 different industries, there are only two industries that cover building retrofit work: one for commercial building repairs and one for residential building repairs. Building decarbonization activities are similar to building repairs but differ in important ways. For example, the distribution of costs for building electrification are more capital intensive than a typical building repair, and the wages can vary significantly depending on the sector and type of work. For this reason, we used construction cost estimators and an extensive literature review to determine the distribution of costs and customize jobs/\$ million multipliers. These multipliers range from 5.4 to 8.8 jobs per million dollars in construction spend, after accounting for capital investments.

5. San Francisco Building Decarbonization Scenarios

For this analysis, costs and jobs associated with retrofitting existing buildings for energy efficiency were estimated along with end use electrification. The efficiency scenario aims for 15-30% energy savings from energy efficiency measures like air sealing, duct



sealing, ceiling insulation, water insulation, floor insulation, lighting retrofits and plug load efficiency, as well as advanced lighting controls. The electrification scenario includes the replacement of gas with high-efficiency electric appliances for the following end uses: space heating and cooling, water heating, clothes drying, and cooking. It assumes that the cost-effective efficiency actions are taken prior to electrification in order to “right size” replacement equipment. The analysis also accounted for jobs associated with gas disconnections and electric panel and service upgrades.

6. Results

Investments in building decarbonization could support significant job growth in San Francisco. Building decarbonization will require both efficiency and electrification; these are not alternative pathways.

In Table 6, the total “job years” are shown in the right-most column. A job year is one full time job for one year. A job year could provide half-time work for two people or full-time work for one person. In this context, a job year is equal to 1800 work hours. The middle column represents this data as work that could support individual workers full time over a 30-year career. The middle column is equal to 30 job years. More than half of this work would be for large buildings, which is relevant because of the better quality and compensation of those jobs relative to the small commercial and residential sector.

TABLE 6. SAN FRANCISCO BUILDING DECARBONIZATION JOB POTENTIAL

	30-year FTE careers	Total “Job Years”
Energy Efficiency Jobs	930 – 1240	28,000 – 37,000
Electrification Jobs	1150 – 1660	34,000 – 50,000
Total Building Decarbonization Jobs	2080– 2900	62,000 – 87,000

Renewable Energy

ES 2: Invest in local renewable energy and energy resilience projects.

- To determine the employment impact of local renewable energy development in San Francisco, the analysis used the most recent cost benchmark study from the National Renewable Energy Laboratory, which at the time of this analysis was the U.S. Solar



Photovoltaic System Cost Benchmark: Q1 2018.³ Researchers followed an analysis-by-parts approach using a California IMPLAN model, which allows for the allocation of costs across different industries. This is useful because the closest IMPLAN industries for municipal solar are non-residential building repairs and new power and communication structure construction, neither of which account for the higher capital costs of solar PV systems.

Continued solar PV development on San Francisco's municipal buildings would support 24 – 47 job years, assuming 2-3 projects per year. Adding energy storage batteries to these projects would create additional jobs for local electricians.

Housing

Sector Goal: Build at least 5,000 new housing units per year with maximum affordability, including not less than 30% affordable units, and with an emphasis on retaining and rehabilitating existing housing.

- To determine the employment impact of new affordable housing units in San Francisco, the analysis relied on high-level cost estimates from the City and the IMPLAN industry for construction of new multifamily residential structures. Building at least 5,000 housing units per year could support up to 30,000 San Francisco workers annually.

Transportation and Land Use

To determine the employment impact of new transportation investments, the analysis used high-level cost estimates from the City with the relevant IMPLAN industries, which included the construction of new highways and streets; construction of other new nonresidential structures; maintenance and repair construction of highways, streets, bridges, and tunnels; and local government passenger transit.

TLU 1-1: Fund and implement the recommendations of the ConnectSF Transit Corridors Study and Muni Forward Plan, including taking steps to...advance major transit capital projects, including a new Westside Subway along 19th Avenue and Geary, the Caltrain Downtown Extension, Central Subway extension, and the Link21 new transbay tube.

- If implemented over 10-15 years, transit improvements could support 3,100 – 4,700 jobs annually for local workers.

³ National Renewable Energy Laboratory. 2019. <https://www.nrel.gov/docs/fy19osti/72399.pdf>



TLU 1-6: By 2025, implement 50 miles of Muni Forward transit priority improvements, including 30 miles of new transit-only lanes. to increase reliability, frequency and safety for riders.

- Implementing 50 miles of Muni Forward projects could support 50 – 60 jobs per year through 2025 for San Francisco workers.
- Implementing 30 miles of transit only lanes could support an average of 470-580 jobs per year for San Francisco workers.

TLU 2-4: Expand the protected bikeway network by at least 20 miles by 2025.

- Expanding the protected bikeway network by 20 miles would support 4-5 local FTE jobs per year through 2025.

TLU 3-1: By 2022, develop recommendations for programs and policies that will advance equity (e.g., provide discounts and exemptions for low-income individuals), reduce vehicle traffic, and increase transit service to downtown. For example, complete the Downtown San Francisco Congestion Pricing Study recommendations, and by 2026, study and implement the appropriate pricing policies.

- The Congestion Pricing Program is designed so that the costs of the program would be covered by revenues from the program itself. The revenues would also go to operating additional transit service and investing in infrastructure improvements. These capital improvements could support up to 900 job years, so if distributed across six years, this program would support 150 FTE jobs per year, plus additional operations and maintenance jobs over the life of the program.

TLU 7-2: Expand publicly available EV charging across the city that is financially and geographically accessible to low-income households and renters.

- To determine the jobs association with EV infrastructure, the analysis used estimates of the numbers of charging ports by type from the City and job calculations from a recent EV charging infrastructure workforce study conducted for the Electric Transportation Community Development Corporation.⁴ The installation of 8,200 public level 2 chargers and 218 new level 3 fast chargers would require about 280 FTE workers per year for 3 years. 60 of these annual jobs would require certified electricians and electrical apprentices.

⁴ Energy and Environmental Research Associates, LLC. June 8, 2021. "Workforce Projections to Support Battery Electric Vehicle Charging Infrastructure Installation." <https://etcommunity.org/assets/files/Workforce-ProjectionstoSupportBatteryElectricVehicleChargingInfrastructureInstallation-Final202106082.pdf>

FUNDING AND FINANCING CLIMATE ACTION IN SAN FRANCISCO

APPENDIX G

Appendix G: Funding and Financing Climate Action in San Francisco

Prepared by ARUP for San Francisco Department of Environment

V1.4 – 11.10.21

1 Introduction

The San Francisco Climate Action Plan (CAP) identifies goals, strategies, and actions across six sectors to reach zero net greenhouse gas (GHG) emissions by 2040 while advancing racial and economic justice. To achieve these goals, implementation funding – for capital projects, program and policy development activities, and expanded stakeholder engagement, just to name a few examples – must both be secured over time *and* greatly increased. This memo provides a high-level overview of issues the City faces when considering how to fund climate action and recommends next steps. It is structured as follows:

- Section 1.1 provides an overview of the funding and financing challenges that cities face when implementing their CAPs.
- Section 1.2 describes San Francisco’s existing revenue sources.
- Section 2 offers an overview of potential funding sources that may encourage behavior changes towards cleaner energy and/or more sustainable consumption patterns.
- Section 3 presents the different financing mechanisms available to leverage funding sources and expedite project and program delivery.
- Section 4 discusses the next steps to generate a funding and financing plan in the short and medium term to support the CAP implementation.

Note that San Francisco’s [10-year Capital Plan](#), and its [5-Year Financial Plan](#), which are primary tools the City uses to fund new and ongoing infrastructure, public health and safety, community development, and other core functions, were not included in the analysis for this appendix, but will be closely considered in any following, in-depth study (as called for in **Sec 4.2: Conclusions and Recommendations**).

1.1 CAP Funding and Financing Challenges

Funding and financing are of primary consideration for the implementation of any project. Typically, large projects or programs (multiple projects) tend to rely on various funding sources such as local, regional, state, and federal.

To accelerate project or program delivery, funding sources are used to secure financing.

- *Funding* is defined as the public spending or the revenue that pays for the development and maintenance of an infrastructure asset; it is money that does not have to be paid back.
- *Financing* is defined as the structure and related instruments used to secure future funding sources; it is money that is borrowed to develop a project and that is later paid back from the project and other revenue sources, typically with interest.

Much urban infrastructure is funded from multiple public sources through a “piecemeal” combination of local, state, and federal programs. Knowing which sources of funding can be used for which projects and how to access them will be critical to move forward with the implementation of the CAP.

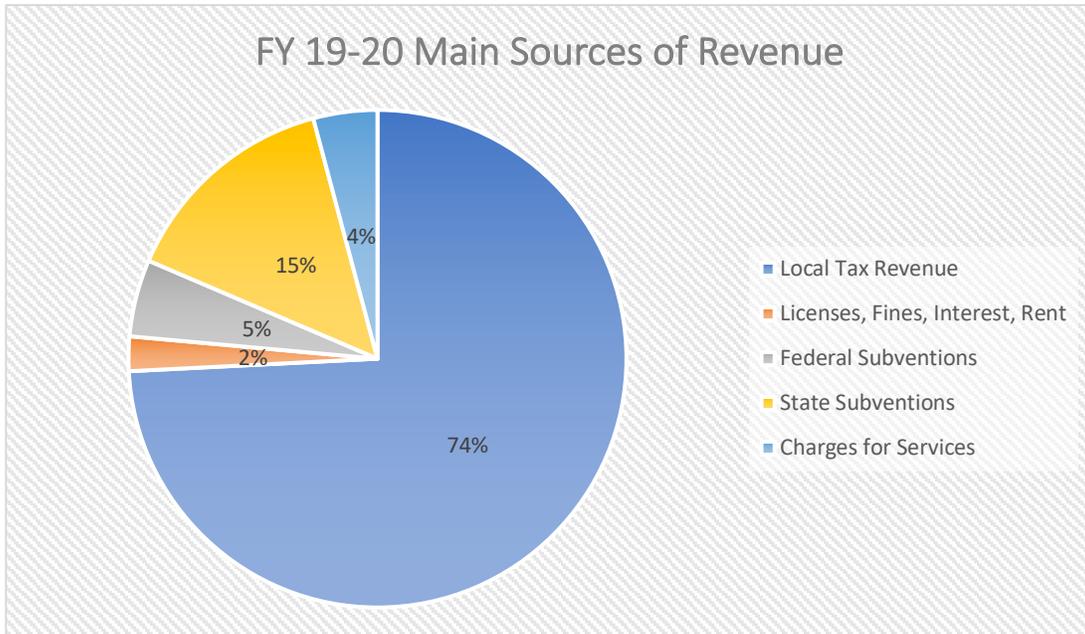
Climate Action Plans typically include actions that take place across short, medium, and long-term time horizons, and thus face multiple challenges when trying to secure funding, including:

- Large costs of program implementation.
- Time horizons are mismatched: plans and projects that cities are currently implementing and paying for do not extend climate benefits beyond their existing scopes and timeframes, even though climate change impacts, such as sea level rise, are expected to accelerate and worsen over the same time period. Additionally, it is generally more difficult to secure funds for medium-and long-term projects since most capital funding sources are made available for projects that can start immediately, not at some point in the more distant future.
- Most climate actions do not have a return-on-investment which can attract traditional sources of private capital, putting pressure on scarce existing public funding sources.
- The multiple sectors addressed in the CAP creates internal competition for limited resources.
- There is currently a shortage of robust federal or state funding frameworks to support city climate action and resilience efforts. While California's recent and [historic \\$15 billion funding package](#) provides an important infusion of funding and could serve as a new model moving forward, much more is needed to fully support CAP implementation.
- Some climate action and climate resilience innovations are still in their initial stages of development and as such, are considered by capital providers to be high-risk investments.
- All CAP implementation must also consider and incorporate adequate equity measures to ensure existing disparities for disadvantaged communities such as BIPOC and low-income residents are not exacerbated. These non-negotiable steps may add complexity to decision-making and governance issues and have cost implications.

1.2 Overview of City of San Francisco's Revenue Sources

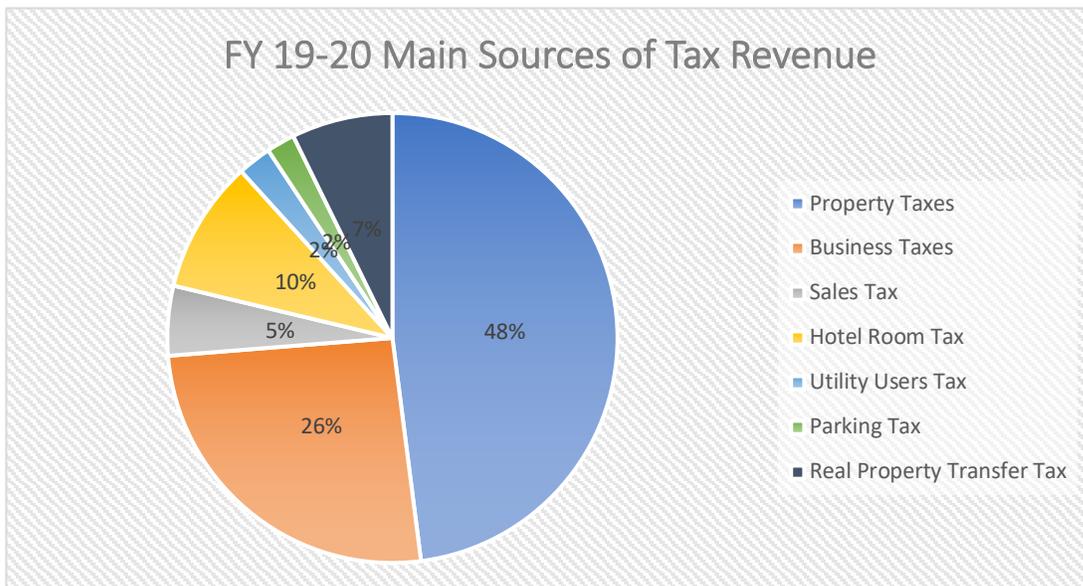
Based on 2019-2020 data from the City of San Francisco, near 75% of the City's revenue comes from local tax revenue, followed by state subventions and federal subventions, representing 15% and 5%, respectively, of total revenue. The rest comes from service charges and licenses and fines, interest, and rents.

Figure 1 City of San Francisco FY 19-20 Main Sources of Revenue



Within the local tax revenue, three taxes comprise over 80% of the total tax revenue: property taxes contribute with near 50%, followed by business taxes with 26% and the hotel room tax with 10%. Tax revenues are the primary source of the operating revenue for the City, they represented \$4.2 billion out of the budgeted \$5.7 billion for the General Fund for FY 2019-2020.

Figure 2 City of San Francisco FY 19-20 Main Sources of Tax Revenue



2 Funding Mechanisms

Table 1 below describes existing funding mechanisms and provides examples and/or precedents of the funding opportunities and challenges of each mechanism to support the CAP. Policy makers face multiple trade-offs when establishing which mechanism to put in place including:

- The mechanism’s ability to generate robust revenue that is reliable and can be counted on in future years.
- The mechanism’s economic burden on low-income communities.
- The political cost to implement the measure.
- The mechanism’s ability to support implementation of various CAP strategies and supporting actions.

Table 1 Funding Mechanisms Matrix

Mechanism	Description	Potential Challenges	Examples and/or Precedents in SF	Applicable CAP Strategies
Utility Tax/Users Fee	Cities and states collect impact fees, user fees, regulatory fees, etc. Fees are typically connected to a certain activity or service. A Utility Users Tax is a tax levied on consumption of utilities, including natural gas, electricity, and water, by non-residential customers; generated revenues would clearly have the ability to fund multiple types of decarbonization efforts.	<ul style="list-style-type: none"> • Increased cost for all non-residential utility payers or users which, without strategies to mitigate impacts, may result in a disproportionate burden on small businesses and other members of low-income communities. • Requires partnership with energy utilities. • City’s ability to repay debt on a bond issuance. 	<p>San Francisco has a utility user tax that was budgeted to generate \$98.7M in FY2019-20.</p> <p>California’s SB 1383 recovery fees – SB 1383 is a statewide effort to reduce emissions of short-lived climate pollutants.</p>	<p>Utility fees may support Energy Supply and Building Operations actions.</p> <p>Transportation fees may support Transportation and Land use actions.</p> <p>Solid waste fees may support Responsible Production and Consumption actions.</p>

<p>Property Taxes/ Parcel Tax</p>	<p>Property tax increases can be used to pay for infrastructure projects derived from climate action priorities. Cities would issue general obligation (GO) bonds backed by property tax revenue to access the revenue sooner. Parcel tax is defined as a form of property tax assessed at a rate based on the characteristics of a parcel – or unit of property.</p>	<ul style="list-style-type: none"> • Requires 2/3 voter approval. • Increased cost for property owner. • External risks - such as a major earthquake or similar large event - to the City's ability to repay debt on a bond issuance¹. • Presents significant equity challenges. E.g., levying flat fee per parcel regardless of income. 	<p>In Miami a property tax increase was used to issue a \$198M GO bond for resilience investments.</p> <p>San Francisco along with the other Bay Area counties approved a \$500M parcel tax increase over 20 years to issue \$425M GO bonds to restore Bay's wetlands.</p>	<p>Projects that may result in an increase in property values could be funded by an increase in property taxes; for example Transportation & Land Use and Healthy Ecosystems strategies.</p>
<p>Sales Tax</p>	<p>Sales tax is a tax that is imposed on sales of certain goods and services. Sales tax can generate a significant amount of funding but requires voter's approval.</p>	<ul style="list-style-type: none"> • Requires 2/3 voter approval. • May impose a disproportionate economic burden on low-income communities. However, this can be mitigated by excluding "necessity goods and services." • Revenue fluctuations may occur in function of the economic cycles. 	<p>In 2018 Portland voters approved a "Clean Energy Surcharge" of 1% on the retail sales within Portland of certain large retailers to support The Portland Clean Energy Community Benefits Fund. Annual revenue expected from the tax is between \$50 million and \$70 million. The fund allocates resources to job training and green infrastructure, prioritizing communities of color and low-income neighborhoods.</p>	<p>A sales tax increase in San Francisco could fund a range of CAP strategies.</p>

¹ San Francisco's General Obligation credit is currently rated AAA/AAA/AA+ which is considered to be very strong and is based on the city's ability to levy the tax base on an unlimited basis.

			<p>In 2020 Denver voters approved a supplemental sales tax of 0.25%. The tax would raise an estimated \$36 million in its first year, which would have to be spent creating jobs in the areas of renewable and clean energy technology and management of natural resources; and on solar power, battery storage and other renewable energy technologies.</p>	
<p>Gas Tax</p>	<p>Gas tax is a type of sales tax imposed on sale of motor gasoline fuels. U.S. has a federal gas tax of 18.3 cents per gallon. Local governments can levy gas taxes too.</p>	<ul style="list-style-type: none"> • If proposed as a general tax, requires 51% voter approval. If it is a special tax (i.e. has an expenditure plan), then would require 2/3 voter approval. • Can disproportionately affect low-income communities who tend to own less energy efficient vehicles, unless strategies to mitigate impacts are incorporated into policy design. • As the fleet becomes more fuel efficient the 	<p>State Gas Tax already exists in California (\$0.50/gallon) - \$0.3 gas tax increase has been introduced under SB1 in 2020. Generated revenue is mainly used to repair and maintain the state's roads and bridges.</p>	<p>Gas tax can primarily fund Transportation-focused strategies and actions.</p>

		revenue from the gas tax will go down.		
Development Opportunities	Link relevant CAP actions and projects with real estate development projects to generate public-private partnerships that generate new sources of funding that can deliver climate mitigation or resilience measures and benefits.	<ul style="list-style-type: none"> Unclear risk allocation between public and private parties 	Hoboken NJ - Stormwater Project/Resiliency Park project includes a deal with a developer, Bijou, to provide the community benefits of a park, public gymnasium, affordable housing, and flood resiliency measures. The project also includes residential building, retail space, and a parking garage.	Depending on the type of a development project, developers can contribute to funding some Housing, Transportation, Healthy Ecosystems, and Building Operations sector actions.
Community Facility District (CFD)	CFD is a special tax district provided in State Law that funds public improvements and on-going services within an identified area. Parks, streets, sewer improvements, and public safety services are some of the public improvements and services that may be financed by a CFD.	<ul style="list-style-type: none"> Creation of special district requires formal approval by petition or vote. Requires 2/3 voter approval <i>within the proposed district boundaries</i>. If there are fewer than 12 registered voters within the proposed boundaries, the vote may pass by the current landowners. 	San Francisco's 450-acre development on Treasure Island will have buildings and streets elevated 3 feet above current 100-year flood elevations. The City plans to use a special-district model, a Community Facilities District, to collect taxes to pay for future sea level rise adaptation.	CFDs, SADs, and EIFDs can be used a range of CAP strategies. However, similar to property tax, the specific mitigation measures must be applicable within the district.
Special Assessment District (SAD)	Property owners pay an additional fee to fund specific improvements or services within the boundaries of the special	<ul style="list-style-type: none"> Requires voter approval Increases the cost of home ownership. 	Transbay Transit Center: the City of San Francisco established a Communities Facilities District (a form of special assessment district)	

	<p>assessment district. The special assessment's purpose must be determined prior to the district's creation and the amount that each property owner pays must be directly proportional to the benefit the property will receive from the proposed improvement.</p>		<p>over the entire redevelopment site to pay for core capital projects and other public infrastructure improvements.</p>	
<p>Enhanced Infrastructure Financing District (EIFD)</p>	<p>EIFDs are similar to tax increment financing the former redevelopment financing tool used in California, EIFD's impose no geographic limitations on where it can be used. Eligible projects include: infrastructure construction and maintenance, housing development, economic development, transportation infrastructure, sewage treatment, and climate adaptation projects, among other uses. Assembly Bill 733 (2017) allows for EIFDs to fund climate change adaptation projects, including but not limited to projects that address conditions that impact</p>	<ul style="list-style-type: none"> Requires agreement among taxing authorities to consent transferring their share of the property tax increment to the EIFD (school districts are excluded). No public vote is required to establish an authority, yet a 55% vote is required to issue bonds. 	<p>Although no currently-formed EIFD is funding climate adaptation or resilience specific projects, some EIFDs are funding sustainability and restoration projects. For example, the proposed City of Redondo Beach/County of Los Angeles EIFD includes urban greening and wetland restoration in its proposed projects. The Redondo Beach EIFD aims to revert its now-closed AES Power Plant's 50-acre site into open space and park development, wetland restoration, and private development.</p>	

	<p>public health (such as decreased air and water quality, temperatures higher than average, etc.) and extreme weather events (such as sea level rise, heat waves, wildfires, etc.).</p>			
<p>Grants</p>	<p>Federal, state, utility, regional and local grant programs as well as philanthropic grant funding are available for specific purposes. Government grants do not require repayment, however often they require either matching funds from the City, staff time to administer the grants (including post-award compliance reporting), or both.</p>	<ul style="list-style-type: none"> • Identifying and taking advantage of niched funding • Grants are often for very specific purposes that may not align with needs • Grants are typically one-time sources and thus are not a reliable source of on-going funding • Since many grants are competitive, it cannot be assumed to be available as needed. 	<p>CalRecycle Food Waste Prevention and Rescue Grants: the purpose of the grant program is to lower emissions by establishing new or expanding existing food waste prevention projects in California to reduce the amount of food being disposed in landfills. This grant is part of California Climate Investments and is funded with cap-and-trade dollars.</p>	<p>Grants can fund a range of Climate Action Plan strategies.</p>

Table 2 below outlines some potential new funding mechanisms that have yet not been implemented in San Francisco but could be effective in shifting market actor behavior towards cleaner energy, low-carbon transportation options, and sustainable consumption patterns.

Table 2 Potential New Funding Mechanisms Matrix

Mechanism	Description	Potential Challenges	Examples and/or Precedents in SF	Applicable CAP Strategies
Carbon Tax	<p>Government sets a price that entities must pay for each ton of greenhouse gas emissions they emit. Two broad forms:</p> <ol style="list-style-type: none"> 1) Emissions tax - based on the quantity an entity produces 2) Tax on goods or services that are greenhouse gas-intensive, such as gasoline. 	<ul style="list-style-type: none"> • Innovative tax that has not yet been implemented in the U.S.; it will require a few years to develop. • Requires voter approval. • If not formulated correctly, this tax can negatively impact disadvantaged communities. 	<p>British Columbia imposed North America's first broad-based carbon tax in 2008. The tax applies to the purchase and use of fossil fuels and covers approximately 70% of provincial greenhouse gas emissions. As implemented, carbon taxes paid by constituents were offset by lower income taxes, corporate taxes or business taxes. Currently, the tax is \$45 per ton CO2.</p>	
Climate Action Plan Tax (form of carbon tax)	<p>Tax dedicated to addressing climate change mitigation. Generated funding can be used to fund policies, programs, direct advising services and rebates to homes and businesses.</p>	<ul style="list-style-type: none"> • Innovative tax that has not yet been implemented – will require a few years to develop. • Requires voter approval. • If not formulated correctly, this tax can negatively impact disadvantaged communities 	<p>Originally passed in 2006 and extended in 2015 to continue through March 31, 2023, the City of Boulder implemented nation's first voter-approved tax dedicated to addressing climate change. Carbon charge generates \$1.8M annually. The tax is levied on residents and businesses based on the amount of electricity consumed. Tax rates are different depending</p>	<p>This tax can be applicable to all CAP strategies. Alternatively, the tax revenue can have a nexus for a specific measure in function of the revenue generated.</p>

			<p>on the sector. Annual average costs:</p> <ul style="list-style-type: none"> • Residential: \$21 • Commercial: \$94 • Industrial: \$9,600 <p>The tax funds a program that requires rental properties to undergo retrofits, thereby reducing renters' energy burden and improving the quality of rental properties.</p> <p>In November 2020, the City of Albany, California, obtained the voter approval to impose a 9.5% blanket utility service tax on all residents except for designated low-income residents. The utility service tax that will ultimately fund general city services, including disaster and emergency preparedness, emissions reduction projects and emergency response and environmental sustainability programs.</p>	
<p>Food Tax</p>	<p>Food tax - a levy imposed on food producers according to the carbon footprint of their products.</p>	<ul style="list-style-type: none"> • Innovative tax that has not yet been implemented; it will 	<p>No precedents yet. UK Health Alliance on Climate Change has called for the implementation of the food</p>	<p>This tax can be applicable to all CAP strategies. Alternatively, the tax revenue can have a nexus for a specific measure (Responsible</p>

	<p>This tax would be similar to the sugar tax on soft drinks.</p>	<p>require a few years to develop.</p> <ul style="list-style-type: none"> • Requires voter approval. • If not formulated correctly, this tax can negatively impact disadvantaged communities. 	<p>tax in 2020 unless the food industry takes voluntary action to reduce the climate impact of food by 2025. It is currently unclear how exactly the tax would work and be calculated as the government has not responded to the proposition.</p>	<p>Production and Consumption actions).</p>
<p>Climate Commitment Act or Cap-and-Invest Bill</p>	<p>Caps emissions from large polluters, and then lowers that cap every year to force them to continually reduce their fossil fuel output. The program and its revenues will fund net-zero emissions initiatives.</p>	<ul style="list-style-type: none"> • Innovative tax that has not yet been implemented – might require several years to develop • Requires significant level of political will 	<p>Climate Commitment Act was passed in the State of Washington in 2021. The bill aims to adopt a comprehensive program that caps and reduces emissions from large emitters. Any company that wants to go over the limit must buy allowances to pollute.</p>	<p>This tax can be applicable to all CAP strategies. Alternatively, the tax revenue can have a nexus for a specific measure.</p>
<p>Downtown Congestion Pricing</p>	<p>Congestion pricing involves charging a fee to drive into downtown during weekday rush hours to reduce vehicle delays, increase safety, clean the local air and address climate change, and advance equity for historically underinvested communities.</p>	<ul style="list-style-type: none"> • Congestion pricing policy must be designed in an equitable manner so as not to negatively impact equity priority communities. • Congestion pricing will require authorization from the state, as well as environmental and other approvals. Anticipate needing at 	<p>The San Francisco County Transportation Authority (SFCTA) is currently studying how a fee to drive downtown during busy hours could help alleviate congestion when the economy recovers. The study is using public feedback and technical analysis to shape a fair and effective congestion pricing recommendation for San Francisco. It will combine</p>	<p>Fee revenue generated by such a program can have a strong nexus for transportation strategies</p>

		<p>least five years to implement.</p>	<p>the congestion fee with discounts and incentives to make the system fair and encourage the use of sustainable transportation modes like transit, walking, and biking. Substantial public outreach has been completed, and a new round of outreach is planned in 2022.</p>	
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3 Financing Mechanisms

Table 3 provides an overview of the City’s General Obligation bond schedule. The primary challenge in introducing new bonds is that the schedule is pre-defined and it is difficult to add new propositions to the rotation. However, some of the proposed programs are directly linked to CAP actions such as the Affordable Housing, Waterfront Safety, Parks and Open Space programs.

Table 3 General Obligation Bond Schedule

Election	Proposed Program	Amount (in \$ millions)
June 2022	Transportation	400
November 2023	Public Health	188
November 2024	Affordable Housing	160
November 2026	Waterfront Safety	130
November 2027	Earthquake Safety and Emergency Response	217
November 2028	Parks and Open Space	151

November 2031	Public Health	TBD
TOTAL		1,245

Recent climate change-related taxes and measures that passed in San Francisco from 2018 to 2021:

- Embarcadero Seawall Improvement Bonds – this proposition was passed in 2018, authorizing the City and County of San Francisco to issue up to \$425 million in bonds at an estimated tax rate of \$0.013 per \$100 of assessed value to fund repairs and improvements to the Embarcadero Seawall and Embarcadero infrastructure and utilities for earthquake and flood safety.
- Revenue Bonds for Power Facilities Excluding Fossil Fuels and Nuclear Energy Charter Amendment – this proposition was passed in 2018, authorizing the San Francisco Public Utilities Commission (SFPUC) to issue revenue bonds for power facilities with two-thirds approval from the San Francisco Board of Supervisors. The proposition was designed to prohibit the PUC from funding power plants run by fossil fuels or nuclear energy.

The Table 4 describes financing mechanisms and provides examples and/or precedents of the funding opportunities in San Francisco.

Table 4 Financing Mechanisms Matrix

Mechanism	Description	Potential Challenges	Example/Precedents in SF	Applicable CAP Strategies
General Obligation (GO) Bonds	GO bonds are secured by voter approved ad valorem property taxes. They are used to pay for projects that provide taxpayer benefits; in some cases, projects that are unable to raise their own revenue (libraries, parks), and in other cases for projects that can (hospitals, affordable housing).	<ul style="list-style-type: none"> • Requires 2/3 voter approval. • The City Charter imposes a limit on the amount of general obligation bonds the City can have outstanding at any given time, which is 3% of the assessed value of all taxable property in the City. 	In June 2016, voters in a 9-county area, including SF, approved Measure AA by more than the state-required 65%--a regionwide local tax to fund nature-based flood protection through wetlands, habitat restoration, and pollution-removal projects. A \$425M general obligation bond was issued to restore wetlands & \$500M	GO bonds can be applicable to any CAP strategy, but it should be noted that bonds issued for private infrastructure cost the City considerably more in interest payments than bonds for publicly owned infrastructure. Source of repayment will be key in allocating GO Bonds.

			<p>parcel tax is being used to repay it.</p>	
<p>Revenue Bonds</p>	<p>Revenue bonds are used to pay for projects such as major improvements to an airport, water system, garage or other large facilities which generate revenue. They are generally repaid from revenues generated by the bond-financed projects (transportation fees, water rates, etc.). There are different types of revenue bonds: lease revenue bonds, special tax revenue bonds, and general airport revenue [bonds?].</p>	<ul style="list-style-type: none"> Once bonding authority is granted, individual bond issuances can be approved by the BOS. Repayment of the bond is from the revenue generated by the project or issuer. 	<p>Proposition A, approved by San Francisco voters in 2018, granted SFPUCA authority to issue revenue bonds to pay for new power facilities with a two-thirds vote of the Board of Supervisors and the support of the Mayor.</p>	<p>Asset-based bonds will primarily be applicable to Building Operations and Transportation and Land Use sector strategies. Revenue bonds could support Energy Supply actions.</p>
<p>Certificates of Participation (COPs)</p>	<p>COPs are a form of security that evidences an undivided fractional interest in an underlying lease or installment sale agreement, entitling the COP owner to a proportionate share of lease or installment sale payments made by a government agency pursuant to a lease (or an installment sale) agreement. For all intents and purposes, COPs function like bonds.</p>	<ul style="list-style-type: none"> No voter's approval needed while complying with California debt limitation laws such as Proposition 13 The SF 10-Year Capital Plan has a policy of limiting COPs to not more than 3% of discretionary General Fund revenue. 	<p>Can be used to support several projects:</p> <ul style="list-style-type: none"> Energy projects Water and wastewater projects Public buildings Solid waste facilities 	<p>COP can support several CAP strategies (Energy Supply, Building Operations, Responsible Production and Consumption).</p>

<p>Energy Loans</p>	<p>Energy loans fund projects by enabling qualified entities to borrow money from lenders and pay it off (with interest, in most cases) over time; borrowers are typically an individual or company.</p>	<ul style="list-style-type: none"> • Applicable to specific type of energy efficiency and decarbonization projects. • Borrowers are required to be a utility customer, and more typically, the designated property owner at the service premise (i.e. there is still limited availability of these types of loans for renters) 	<ul style="list-style-type: none"> • On Bill Financing (OBF) programs currently being offered within investor-owned utility services areas provide 0% interest loans that can be paid back with energy savings. 	<p>Today these are primarily used to fund energy efficiency retrofit projects that support Building Operations strategies.</p>
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Note about “Green Bonds”: Certificates of Participation (COPs), GO bonds, and revenue bonds all may be designated as green bonds if it can be demonstrated that they support climate and environmental goals. In some cases, green bond issuances may require voter approval, but in other cases e.g. SFPUC revenue bonds for renewable energy facilities, they do not. Since issuing its first designated green bond in 2015, the SFPUC has sold more than \$2.5 billion in certified green bonds to finance capital projects for all three of its enterprise utilities: water, wastewater, and power. Bonds and other potential sources of financing labelled green can support a range of CAP strategies at potentially lower costs through increased investor demand for green- and ESG-labeled debt².

² ESG stands for Environmental, Social, and Governance. Investors can apply these non-financial factors as part of their analysis process to identify material risks and growth opportunities. Climate risks and opportunities figure prominently in the evaluation process.

4 Funding Pathways

4.1 Funding Pathways

This section shows possible funding and financing pathways to implement nine high-impact and capital-intensive CAP strategies, which are:

- Energy Supply (ES 2): Invest in local renewable energy and energy resilience projects.
- Building Operations (BO 2): Eliminate fossil fuel use in existing buildings by tailoring solutions to different building ownership, systems, and use types.
- Transportation and Land Use (TLU 1): Build a fast and reliable transit system that will be everyone's preferred way to get around
- Transportation and Land Use (TLU 2): Create a complete and connected active transportation network that shifts trips from automobiles to walking, biking and other active transportation modes.
- Transportation and Land Use (TLU 7): Where motor vehicle use or travel is necessary, accelerate the adoption of zero-emissions vehicles (ZEV's) and other electric mobility options.
- Housing (H 4): Expand subsidized housing opportunities for low, moderate, and middle-income families.
- Healthy Ecosystems (HE 4): Optimize management of the City's entire urban forest system.
- Healthy Ecosystems (HE 7): Conduct carbon sequestration farming pilot projects and research.

Finance and planning staff from key city agencies were engaged to provide information and insight to discuss potential funding sources to support CAP implementation and help identify strategies that may overlap with agency goals over the coming years. The overall conclusion is that there are opportunities to align CAP strategies with existing project and planning priorities, but there is a significant funding gap to implement everything that has been identified in the CAP. Currently much of the city's major capital planning efforts focus on infrastructure needs such as basic maintenance and earthquake safety. To Implement CAP strategies in a timely matter, the City must secure dedicated, additive revenue streams for years to come.

Cities are increasingly recognizing the need to address climate change in an equitable manner. Some cities such as Denver and Boulder, CO, Portland, OR, Long Beach, CA, and Albany, CA, are creating dedicated funding streams that intend to distribute funds with a strong equity focus. For example, Denver is committing to invest 50% of the revenue generated in low-income communities, while Boulder and Portland focus the majority of the programming to support low-income and minority communities. While the new revenue

generated by the sales tax increase in Denver will aid in CAP Implementation, this is still short from the estimated \$200 million needed annually to meet emission-reduction goals. Therefore, Denver is expecting to put a new energy tax on their 2021 ballot. Under the current proposal, households and businesses would only be taxed above an energy-use threshold and low-income residents would be exempted.

Federal funding, including the Biden Administration’s proposed infrastructure funding bill, can provide essential financial support for local climate action, but cities will still need to identify and secure other local long term revenue streams given that many of the CAP’s most impactful strategies are long-term implementation efforts which will require steady and ongoing funding.

Table 5. Dedicated Taxes to Support Equitable Climate Action

	Type of Tax	Year of Approval	Equity considerations	Annual Revenue Estimated
Boulder, CO	Energy tax consumption based	2006	The program generates revenue that is used to offset costs to retrofit rented apartment buildings to reduce energy consumption and energy bills.	\$1.8M
Portland, OR	Large retailers gross receipt tax	2018	The tax excludes certain qualified groceries, medicines, prescription drugs, and health care services.	\$40M-\$60M
Denver, CO	Sales tax	2020	The tax excludes goods considered essential such as food, water, medicine, or feminine hygiene products.	\$40M
Long Beach, CA	Tax on oil production	2020	Tax is on barrel production, so no direct equity impacts.	\$1.6M
Albany, CA	Energy tax	2020	Low-income households are excluded from paying the tax.	\$1.6M

Funding sources can either be used directly or can be used to secure financing, but the critical path for timely CAP implementation is to identify and use funding sources to leverage into much more capital to greatly accelerate delivery of CAP projects.

At the same time, the City could take a “global approach” to fund the CAP, which could include actions such as increasing existing taxes (sales tax, business tax, or other) and/or creating new taxes (energy tax, carbon tax) as some cities are already doing.

Potential funding and financing pathways for key CAP strategies and supporting actions are described next.

4.1.1 ES 2: Invest in local renewable energy and energy resilience projects where safe and affordable, and BO 2: Eliminate fossil fuel use in existing buildings by tailoring solutions to different building ownership, systems, and use types.”

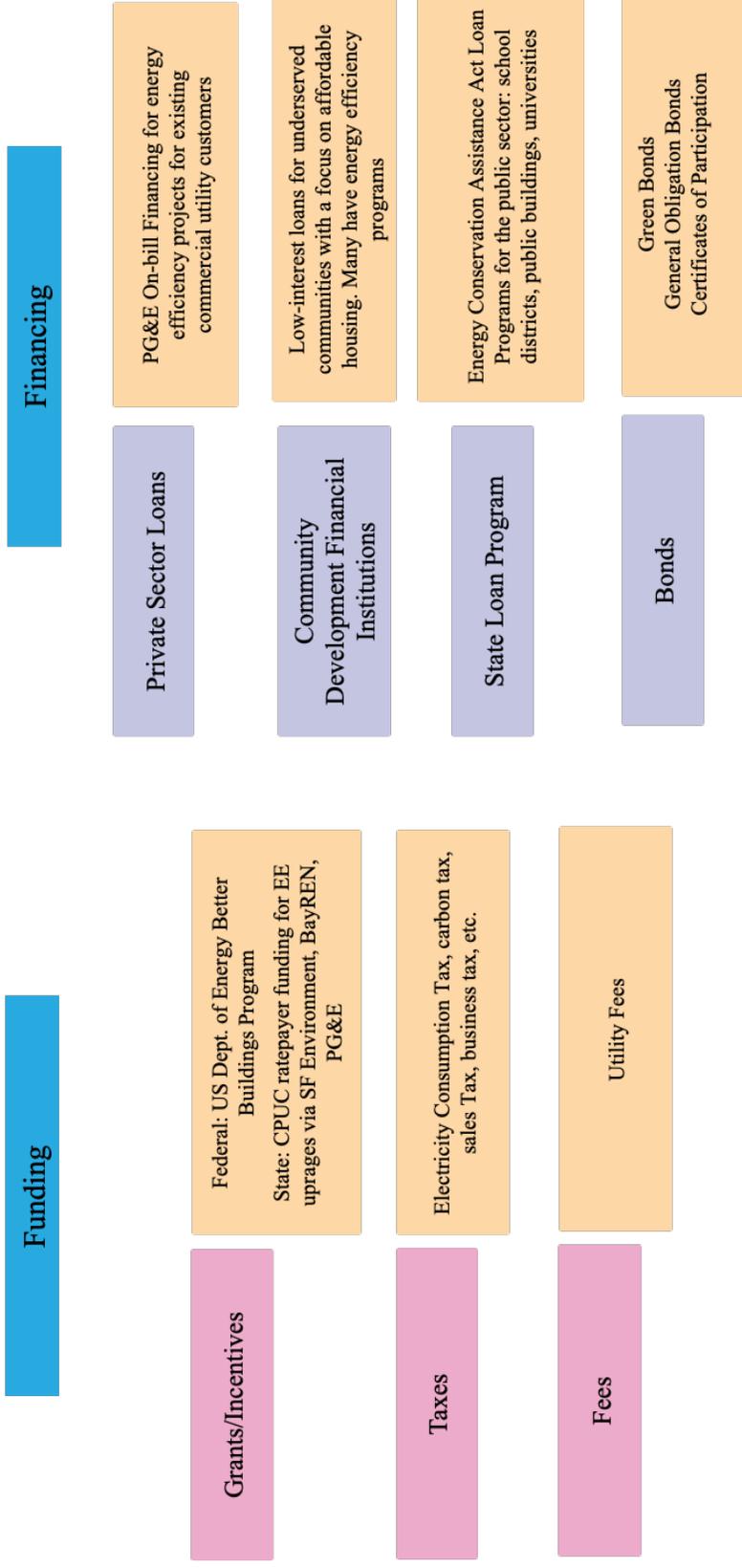
SFPUC has access to various funding streams and has a capital budget of \$1B. Currently 80% of the projects are financed through revenue bonds and some are financed through federal/local bonds. SFPUC leverages ratepayer revenue to pay for revenue bonds. Recently, the “Revenue Bonds for Power Facilities Excluding Fossil Fuels and Nuclear Energy” Charter Amendment was passed by the BOS and allows more liberal debt issuance. Additionally, SFPUC has been leveraging green bonds issuance since 2015. SFPUC has routinely been able to secure lower rates with green bonds issuance through increased investor demand for green-labeled debt.

SFPUC currently administers the CleanPowerSF program which offers 100% renewable electricity to residents and businesses. However, at times SFPUC incurs financial losses as electricity must be sold at the same rates as PG&E, which leads to the need to subsidize the program with available reserves.

Current funding options for building decarbonization retrofits called for by BO 2 are currently limited but are likely to grow in the coming years as the state and regional agencies expand efforts to close funding gaps. One existing option for commercial customers is PG&E’s On-Bill Financing (OBF) loan program. OBF loans range between \$5,000 and \$4,000,000 per premise, with loan terms of up to 120 months at 0% interest. Monthly retrofit savings are calculated in advance to be equal to or greater than monthly loan payments. Additionally, the Bay Area Regional Energy Network (BayREN) currently offers cash rebates for installing electric appliances like heat pumps.

Figure 3 shows a sample of current funding and financing pathways for strategies ES 2 and BO 2. In the future, the City could consider implementing an energy tax like Boulder, CO and Albany, CA; or a carbon tax like British Columbia; or modifying the existing utility-users tax to generate new funding for Energy Supply and Building Operations strategies. Another promising new financing strategy for building decarbonization is to use what is referred to as “tariffed on-bill financing” which is being explored at the state level under the emerging [TECH \(Technology and Equipment for Clean Heating\)](#) program; TECH will soon also be offering significant new financial rebates and incentives for low-emissions building equipment. Alternatives exist to mitigate the impact on low-income communities, as shown in Table 2 previously.

Figure 3. Scan of Funding and Financing Mechanisms: Energy Supply and Building Operations strategies (not a comprehensive list of all sources available)

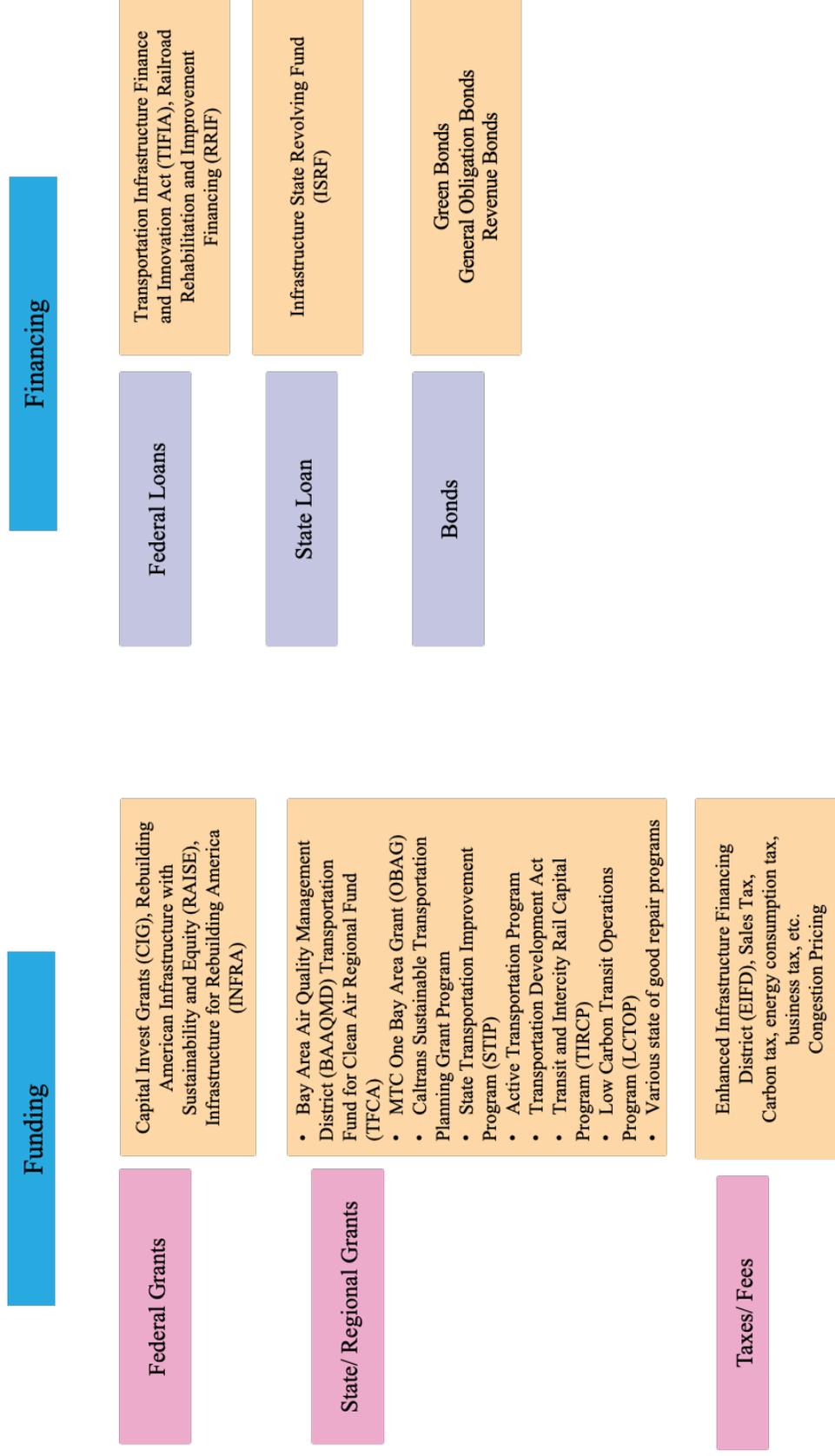


4.1.2 **TLU 1: Build a fast and reliable transit system that will be everyone's preferred way to get around. & TLU 2: Create a complete and connected active transportation network that shifts trips from automobiles to walking, biking, and other active transportation modes.**

Based on discussions with SFCTA and SFMTA, there is currently insufficient funding to fully implement the TLU strategies. Rough order of magnitude costs by 2030 to implement various TLU strategies range from less than \$1 million each, to upwards of \$1 billion for others. Currently, the City is investing hundreds of millions of dollars toward building transit and improving walking and biking

infrastructure. Identifying new local transportation revenues is important - for example, by raising existing taxes or creating new ones - but just as important is continuing to leverage both new and existing local money to attract state and federal investments. The City must expand advocacy for funding at the state and federal levels for local transportation and land use projects that will advance climate and equity goals.

Figure 4. Scan of Funding and Financing Mechanisms: Transportation (not a comprehensive list of all sources available, does not address land use strategies)



4.1.3 TLU 7: Where motor vehicle use or travel is necessary, accelerate the adoption of zero-emissions vehicles (ZEVs) and other electric mobility options.

SF Environment clean transportation program staff provided rough order of magnitude (ROM) estimate costs for strategy TLU 7 and its supporting actions. Funding sources are anticipated to vary for the different supporting actions. Currently, new electric mobility projects are funded through six public sector sources: California Air Resources Board (CARB) grants, California Energy Commission (CEC) grants, Department of Energy (DOE) grants, Bay Area Air Quality Management District (BAAQMD) grants, Low Carbon Fuel Standard (LCFS) funds and Volkswagen (VW) Settlement funds.

Details regarding specific TLU 7 supporting actions are included below:

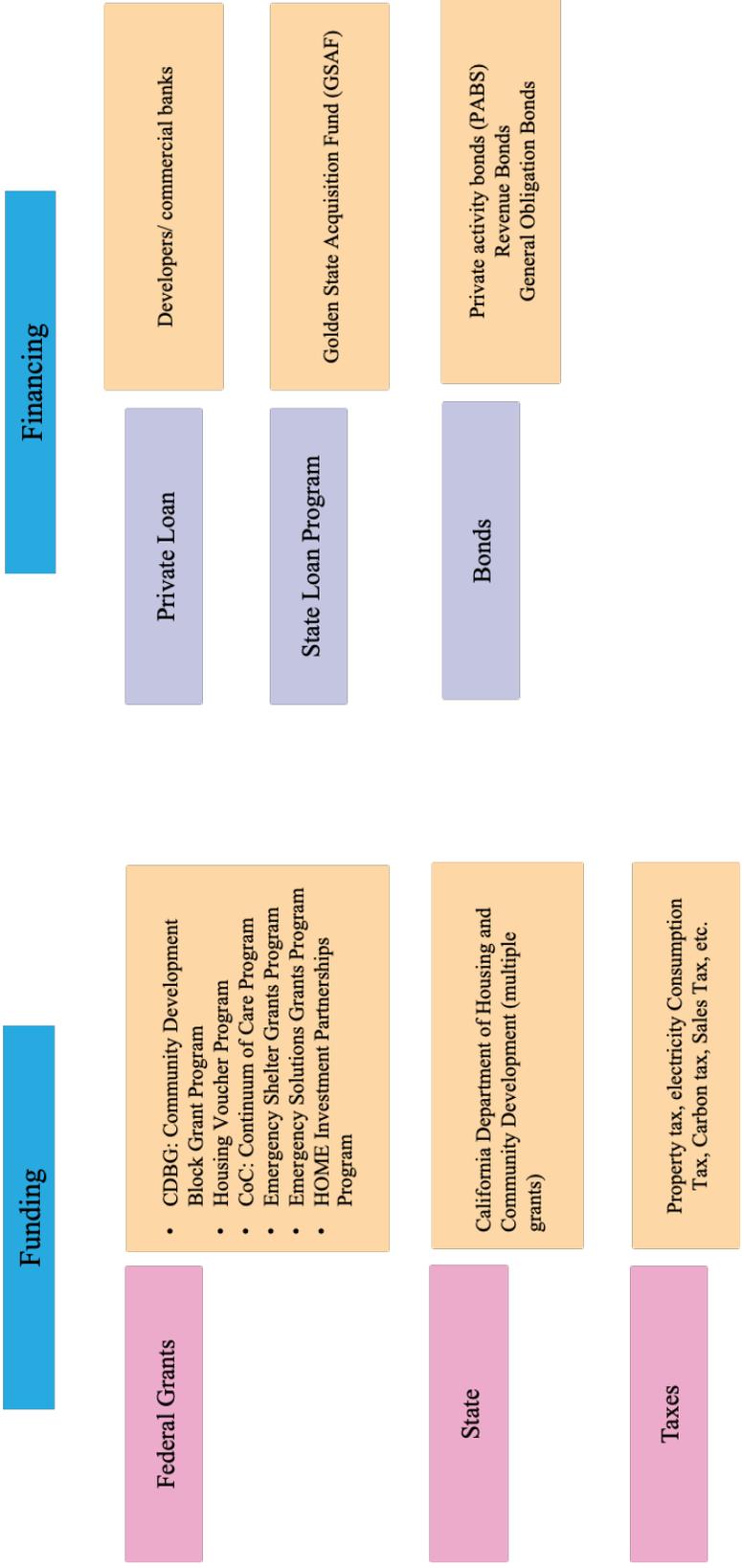
- TLU 7-1: DOE's Clean Cities grants can be utilized to fund a portion of the cost required to implement the supporting action, but additional funding is needed to expand its implementation.
- TLU 7-2: the 2022 evaluation framework for the development of curbside charging pilots has been completed. As of November 2021, CEC has provisionally awarded \$2.5 million in grant funding to SF Environment to implement a number of clean transportation projects, including: one to build a DC fast-charging hub serving a Disadvantaged Community within the city, and another will support the provision of an "EV Ombudsperson" to facilitate project application, permitting and reviews for EV charging locations.
- TLU 7-3: SFE has secured \$200,000 in funding from the CEC to create a plan to support medium-and-heavy duty charging infrastructure.
- TLU 7-4: San Francisco International Airport will lead engagement efforts and identify funding to establish the standard. Transportation Network Companies may potentially be interested in supporting this action by providing outreach and financial resources.
- TLU 7-5: ROM estimate to implement the action is \$560,000. As of November 2021, CEC has provisionally awarded \$2.5 million in grant funding to SF Environment to implement several clean vehicle projects, including an electric bicycle program for last-mile food delivery services.
- As for action TLU 7-6, there is no specific funding strategy in place. SF Environment will track availability of applicable grant opportunities and noted that the market for zero-emission construction equipment is in the very early stages and will not be viable for pilot projects for a number of years.

4.1.4 H 4: Expand subsidized housing opportunities for low, moderate, and middle-income families.

Based on the discussion with the Planning Department's housing team, the CAP's Housing strategies were developed in alignment with the policies from the City and the Mayor's office, as well as citywide racial and social equity priorities. Currently, there is a \$9 billion funding gap to achieve CAP's housing strategies and a \$13 billion gap if [Regional Housing Needs Allocation \(RHNA\) goals](#) are to be met. Affordable housing requires government, state, and local subsidies. The City's current Capital Plan accounts for all the production and preservation needs for affordable housing; includes all sources and uses for the next few years. Proposition C, a gross receipts tax initiative to fund homelessness services, which would generate \$300 million annually was passed in 2018. However, due to legal disputes this measure has not been included in the Capital Plan. Most recently, on April 28, 2021, the California Supreme Court declined to hear an appeal of the ruling on Prop C, allowing the City to continue collecting the tax and to spend the revenue from the tax. The \$300M per year will be a new funding source to support expansion of subsidized housing.

The state is preparing to issue a new bond next year, which will be a key capital source. The City remains hopeful that the new federal Infrastructure Bill will bring in additional funding and expand the housing choice voucher program. However, local permanent sources such as increasing existing taxes or creating new ones should be considered to help bridge the gap.

Figure 5. Scan of Funding and Financing Mechanisms for Housing strategies (not a comprehensive list of all sources available)



4.1.5 HE 4: Optimize management of the city's entire urban forest system & HE 7: Conduct carbon sequestration farming pilot projects and research.

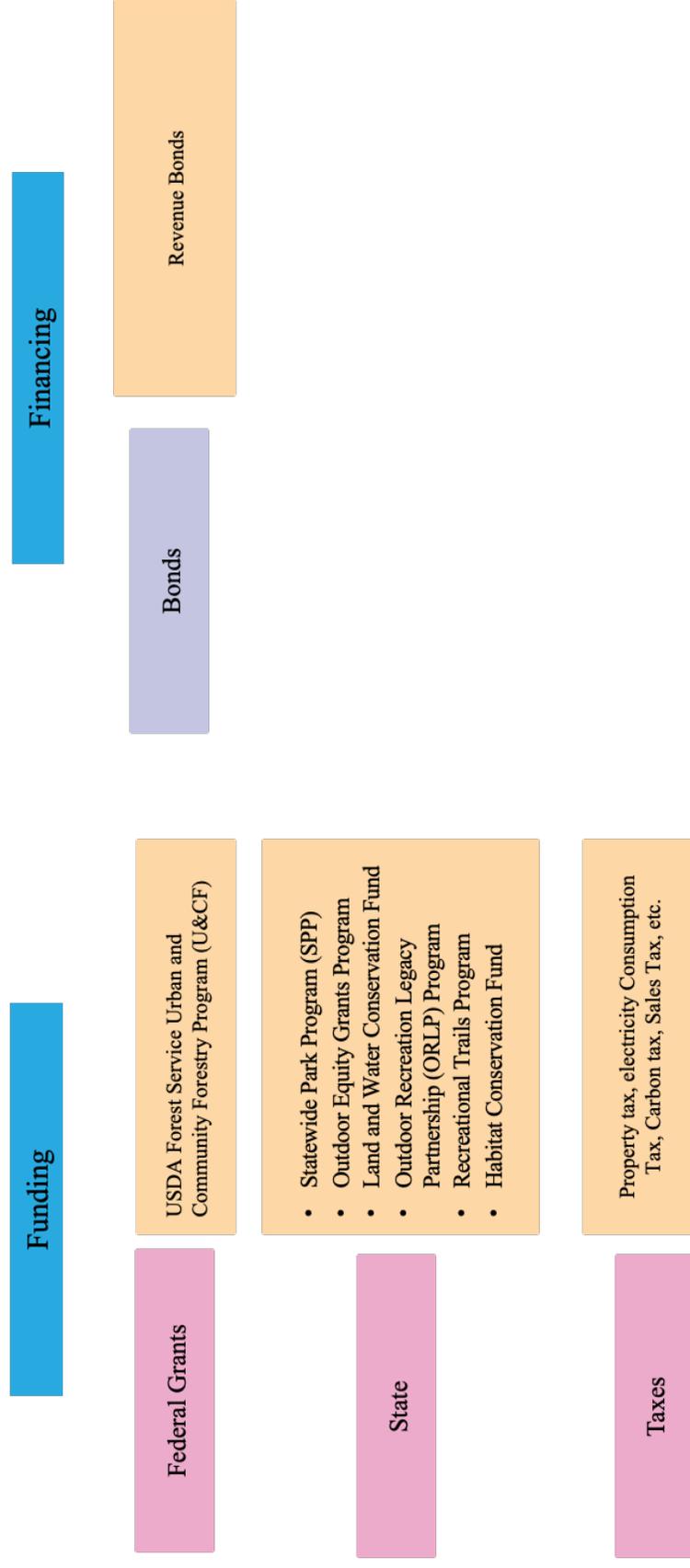
Staff from SF Environment's biodiversity program and the Recreation & Parks Department (RPD) provided context and background regarding available funding for urban forestry and carbon sequestration pilot projects and research.

In 1975, the Open Space Acquisition and Park Renovation Program ("Open Space Program", or OSP) was established under Proposition J to set aside a portion of the City's property tax revenue for this purpose. Since then, voters have approved the extension of the program. In 2000 voters approved Proposition C which extends the program through 2031 and authorizes the issuance of revenue bonds for capital improvements, secured by the OSP, and allows the RPD Commission to manage all aspects of those improvements. In 2016, voters approved Proposition B which extended the OSP an additional 15 years to 2046. General Obligation Bonds approved by

voters in 2008 and 2012 both included funding for urban forestry. The 2020 Health and Recovery Bond also included an allocation for parks, open space, and related sustainability projects.

RPD’s annual budget is made up from equal parts of OSP, earned revenue, and the General Fund (GF). Staffing for the Department’s forestry programs is supporting by all three sources. RPD’s smaller capital projects, deferred maintenance, and operational activities are funded through the GF capital baseline. Annually, a portion of the GF capital baseline is allocated to forestry work; presently all forestry capital is being paid through GF. Larger capital projects, i.e., those on the scale of \$2M-20M and which include things such as such as greening and forestation projects, are never fully funded from the General Fund; however, General Fund may be used to close funding gaps. Additionally, there are several state grants available for greening, restoration, and forestry projects. The Biden Administration’s proposed Infrastructure Bill is expected to include dedicated funding for urban and community forestry projects. Additional funding sources could be secured by increasing existing taxes (property tax, business tax, sales tax), or by creating new ones (carbon tax, electricity consumption tax).

Figure 6. Scan of Funding and Financing Mechanisms for Healthy Ecosystems strategies (not a comprehensive list of all sources available)



Note on City staffing and related administrative support (to develop policies, conduct stakeholder engagement, etc.)

In addition to the challenges of direct funding gaps for implementing CAP strategies and actions, the City must also identify resources and funding for staffing and administrative support. Ongoing efforts require adequate staffing, new policies and programs must be developed, stakeholders need be engaged, and many types of technical analysis must be performed to ensure impactful and equitable outcomes. In implementing its Climate Action Plan Tax, the City of Boulder explicitly earmarked resources to support staff to develop and administer climate programs. San Francisco must also consider this when identifying funding resources for the CAP.

4.2 Conclusions and Recommendations

To realize CAP outcomes in a timely manner, federal, state, and local funding sources need to be mobilized and leveraged to the fullest extent possible; limited duration grants and existing department budgets will not be enough to fully fund implementation of the CAP. The City must consider and take steps to secure funding by using tools such as: increasing existing taxes (sales tax, property tax, business tax, etc.), creating new ones (carbon or energy tax), or a combination. Equitable, affordable, and accessible financing also must be made available for climate projects. The City acknowledges upfront that increasing existing or creating new taxes may raise serious equity concerns, so it should commit to progressive approaches that will mitigate economic impacts on low-income households and other vulnerable groups. At the same time, there are instances where taxes may inherently *support* equity; for example, taxes such as a billionaire's income tax, capital gains tax, and/or inheritance tax can reduce inequality by raising significant revenue for equitable climate projects and programs.

Recommendations for next steps:

1. Create an interdepartmental climate finance working group to assess the economic, social, political, and administrative viability of securing new funding sources and identify targeted funding solutions for CAP implementation across the six sectors.
2. Develop a detailed cost estimate for implementing CAP actions – currently the CAP has only identified strategies and actions needed to meet the City's climate goals, along with and ROM costs
3. Identify all opportunities to fund CAP strategies from existing funding sources and approved measures. Accounting for how much of CAP is already funded through City's current revenue streams, activities, and bonds is imperative to move forward.
4. Assess which CAP strategies are not funded or partially funded to identify funding gaps.
5. Investigate a new tax (carbon tax, food tax) and/or increase existing taxes (sales tax, property tax) as a major contributor to reducing funding gaps.
6. Seek out and apply for relevant federal, state, and local grant opportunities which can serve as important seed funding for implementing CAP strategies or other supporting activities such as community engagement or technical analysis.

