City of Richmond
Climate Action Plan
The Richmond community continues to engage in local efforts to help prevent climate change, and to better prepare the community for future impacts. The City recognizes that the environment is an important determinant in community health, and is committed to improving the safety, sustainability and health for all Richmond residents. The Richmond Climate Action Plan (CAP) provides a framework of policies and programs to achieve the City’s health and environmental goals by operationalizing the community-driven vision set forth in the Richmond General Plan 2030.
The Richmond CAP emphasizes community input and cross sector collaboration to prioritize outcomes with the most community benefits. Through the development of the CAP, the City continues to build capacity initiated by the Richmond Healthy Equity Partnership and Health in All Policies Strategy to address more than environmental concerns. The CAP strengthens Richmond’s commitment to health equity and creates a plan to serve the interests and well-being of the entire community – the environment, the economy, and the residents.

Climate change is a global challenge with local impacts; when these impacts are approached with thoughtful planning, opportunities are created for significant, positive development in the Richmond community. Addressing climate change will create a more secure future for Richmond, and presents an opportunity to overcome many challenges that the community faces today. Richmond’s health equity lens allows for the creation of a plan with a nontraditional focus that will engage all City departments to better serve the public’s needs.

Many opportunities for improvement and adaptation are identified in the following pages, and this plan will complement the City’s ongoing efforts to lead and innovate through local policy. With close collaboration from hundreds of residents, the University of California, Berkeley, Department of City and Regional Planning and School of Public Health, the Y-PLAN Center for Cities and Schools, West Contra Costa Unified School District, local community based organizations, the City co-developed a plan to serve the needs of the Richmond community and become an active participant in a global effort.

“Climate action and health equity go hand in hand, and are among the City’s top priorities.”

Bill Lindsay  
City Manager
## Acknowledgements

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Richmond Trees  
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Richmond Community Foundation  
Richmond Environmental Justice Coalition  
Rising Sun Energy Center (RYSE) Youth Center  
San Francisco Bay Conservation and Development Commission (BCDC)  
Solar Richmond  
The California Endowment  
West Contra Costa Unified School District  
YES – Nature to Neighborhoods  
Youth Plan Learn Act Now! (Y-PLAN)
City Accomplishments:

Taking Climate Action Since 2005

1. In 2008, Richmond City Council adopted a resolution to commit to the GHG emissions target established by AB 32, and completed their first GHG Inventory for the baseline year 2005.

2. Created the Richmond Build program in 2007 to provide ‘green’ job training and employment opportunities for local youth.

3. Installed solar on 175 lower income homes through our partnership with GRID Alternatives.

4. Upgraded all of our streetlights with high efficiency LED fixtures!

5. Adopted our Bicycle Master Plan in 2011, laying plans for a 145 mile network of Bikeways through the City.

6. Updated our General Plan to include a new Energy and Climate, and Health and Wellness Elements!

7. Over 80% of our residents and businesses have enrolled in MCE’s Light Green program, which supplies 50% of their electricity from renewable sources.

8. In 2014, we began weekly collection of recycling and green waste for residents.

9. Adopted the Health in All Policies (HiAP) strategy and ordinance in 2015, to ensure the health of Richmond residents comes first!

10. In 2016, we approved the MCE Solar One project to build a 10.5 MW solar facility at the Chevron Refinery, which will be the second largest solar field in Bay Area!
In 2015, the City of Richmond recognizes partnered with the Y-PLAN (Youth – Plan, Learn, Act, Now) Center for Cities and Schools to engage 265 students in Richmond High's Health Academy to create adaptation and mitigation strategies to inform Climate Change Policy in Richmond. Each grade level focused on a different level including individual/household, schools, the City, and small businesses on how each sector could create change. Over 300 guests from the City, community organizations, parents and other stakeholders were in attendance to hear students’ findings and recommendations at the Y-PLAN Final Presentations in early May 2015. This event marked the formal launch of this Climate Action Plan.

### Top Personal Actions to Support our Climate Goals, as Recommended by Richmond High School Health Academy

1. Walk, bicycle and use public transportation instead of driving.
2. Retrofit buildings with more efficient lighting (e.g., LEDs), improved insulation and windows, and solar panels.
3. Take advantage of local programs and rebates to install solar panels, reducing energy costs and our reliance on fossil fuels.
4. Turn out lights and unplug electronics when not in use.
5. Participate in composting and recycling services provided by the City to save money and reduce the amount of waste sent to the landfill.
6. Conserve water by reducing shower times, skipping flushes, installing cistern displacement devices in toilets, retrofitting with water-saving fixtures.
7. Replace lawns with drought-tolerant landscaping.
8. Install greywater systems to capture and repurpose (non-toilet) domestic wastewater for irrigation.
9. Install green roofs to diminish heat island effect.
10. Support urban gardens and buy produce at your local farmers markets to access to fresh food and reduce the greenhouse gases from transportation.

---

1 In 2015, the City of Richmond recognizes partnered with the Y-PLAN (Youth – Plan, Learn, Act, Now) Center for Cities and Schools to engage 265 students in Richmond High’s Health Academy to create adaptation and mitigation strategies to inform Climate Change Policy in Richmond. Each grade level focused on a different level including individual/household, schools, the City, and small businesses on how each sector could create change. Over 300 guests from the City, community organizations, parents and other stakeholders were in attendance to hear students’ findings and recommendations at the Y-PLAN Final Presentations in early May 2015. This event marked the formal launch of this Climate Action Plan.
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AB 32
Assembly Bill 32, the California Global Warming Solutions Act of 2006. Establishes a comprehensive program of regulatory and market mechanisms to achieve real, quantifiable, cost-effective reductions of greenhouse gases for the state of California.

ABAG
Association of Bay Area Governments, an agency that provides planning and research resources related to land use, housing, environmental and water resource protection, disaster resilience, energy efficiency and hazardous waste mitigation, risk management, financial services and staff training to local cities, and towns in the Bay Area.

AC Transit
Alameda Contra Costa Transit District is the public transportation agency serving both Alameda and Contra Costa Counties.

Adjusted BAU
An adjusted “business as usual” emissions forecast that includes the effects of state-wide emissions reductions measures such as updates to building energy standards and implementation of programs to decrease emissions from on-road vehicles.

AHSC
Affordable Housing and Sustainable Communities Program, a state program that funds land-use, housing, transportation, and land preservation projects to support infill and compact development that reduce greenhouse gas emissions.

ART
Adapting to Rising Tides, a collaborative project created by the San Francisco Bay Conservation and Development Commission and the National Oceanic and Atmospheric Administration’s Office for Coastal Management to identify how current and future flooding along the shoreline will affect communities, infrastructure, ecosystems, and the economy, and to implement appropriate federal, state, regional, and local adaptation responses.

ATP
Active Transportation Program, a suite of legislative actions signed by Governor Brown on September 26th, 2013 that is intended to encourage the increased use of active modes of transportation (i.e., walking and biking).

BAAQMD
Bay Area Air Quality Management District, the regional air pollution control agency for the Bay Area.

BARC
Bay Area Regional Collaborative, coordinates the climate change planning efforts of the Association of Bay Area Governments, the Bay Area Air Quality Management District, the Bay Conservation and Development Commission, and the Metropolitan Transportation Commission.

BART
Bay Area Rapid Transit is the high speed rapid rail network that serves the Bay Area.

Baseline Inventory
An assessment of greenhouse gases in a base year by which future trends in emissions can be compared.

BAU
Business as Usual is a scenario that assumes that no new actions will be taken to reduce greenhouse gas emissions from current and future residents and businesses within the City.

BBK
Building Blocks for Kids, a non-profit organization with the goal of creating communities where the needs of children with physical, emotional, and developmental challenges are being met.

BCDC
San Francisco Bay Conservation and Development Commission is a California state planning and regulatory agency with regional authority over the San Francisco Bay, the Bay’s shoreline band, and the Suisun Marsh.
Glossary of Terms and Acronyms

**BESO**
Building Energy Savings Ordinance, an ordinance that requires building owners to complete energy efficiency assessments and publicly report their building’s energy efficiency information with the goal of helping building owners save energy and motivate them to participate in whole-building energy efficiency retrofits.

**BHC**
Building Healthy Communities, a ten-year, comprehensive community initiative spearheaded by The California Endowment.

**C&D**
Construction and demolition debris is waste that is generated during construction activities.

**CAFÉ**
Corporate Average Fuel Economy, federal fuel efficiency standards enacted in 1975 to improve the average fuel economy of cars and light trucks produced for sale in the United States.

**CalEPA**
California Environmental Protection Agency, the state agency charged with developing, implementing and enforcing California’s environmental protection laws.

**CALGreen**

**California Building Code**
California Code of Regulations Title 24, also known as the California Building Standards Code. Title 24, Part 6 sets forth California’s energy efficiency standards for residential and nonresidential buildings.

**CalTrans**
California Department of Transportation, the agency that manages the state highway system and other public transportation systems controlled by the State.

**CAP**
Climate Action Plan, a plan that is prepared by an entity to reduce greenhouse gas emissions.

**CAPCOA**
California Air Pollution Control Officers Association, an association of air pollution control officers that represents all thirty-five local air quality control agencies in California.

**CARB**
California Air Resources Board, the agency in charge of air quality regulation for California.

**CAT**
Climate Action Team, a group created as part of AB 32 that is tasked with preparing biennial science assessment reports on climate change and adaptation options for California.

**CBO**
Community-Based Organization is any local organization that provides services to residents and businesses within a community.

**CBTP**
Community-Based Transportation Planning, programs that promote a balanced, comprehensive, and multi-modal transportation system

**CCA**
Community Choice Aggregation, a type of energy supply program that allows cities and counties to aggregate the buying power of individual customers within a jurisdiction to secure alternative energy supplies.

**CCISCO**
Contra Costa Interfaith Supporting Community Organization, a community-based organization.

**CEC**
California Energy Commission, the State’s primary energy policy and planning agency.

**CEQA**
California Environmental Quality Act (California Public Resources Code § 21000 et seq.,) is a state statute adopted in 1970 that requires state and local agencies to analyze and disclose the environmental impacts of proposed projects.

**CFCs**
Chlorofluorocarbons are greenhouse gases.

**CH4**
Methane is a greenhouse gas.

**CO2**
Carbon dioxide is a greenhouse gas.

**CO2e**
Carbon dioxide equivalent, a measurement used to compare the emissions of various greenhouse gases based upon a common metric for global warming potential (GWP).

**Community-wide**
Refers to activities that occur within a community or city’s geographic boundary.

**CPUC**
California Public Utilities Commission, the agency that regulates public utilities in California.
Glossary of Terms and Acronyms

CSD
Community Services Department, the state agency that partners with a network of private, non-profit and local government community service providers dedicated to helping low-income families achieve and maintain self-sufficiency, meet their home energy needs and reside in housing free from the dangers of lead hazards.

CYES
California Youth Energy Services, a community-based organization.

Demand Response
Mechanism for managing end-user electricity consumption in response to energy supply conditions, especially during summer periods when electricity demand on the California power grid is high.

Direct Access
Direct access service is when customers elect to purchase electricity and other services from an electric service provider (ESP), instead of from a public or private utility company.

DOE
United States Department of Energy, a Cabinet-level department of the United States Government concerned with the United States’ policies regarding energy and safety in handling nuclear material.

DOF
California Department of Finance prepares, explains and administers California’s annual financial plan, the California Budget. Also conducts demographic research.

DOT
U.S. Department of Transportation, the federal Cabinet department of the U.S. government concerned with transportation.

EBMUD
East Bay Municipal Utilities District, a public water agency serving Alameda and parts of Contra Costa counties.

ECIA
Environmental and Community Investment Agreement, refers to the agreement that the City entered into with Chevron to provide funding for community programs for a period of ten years.

EDA
East Bay Economic Development Alliance, a community based organization focused on economic development.

EIR
Environmental Impact Report, a report created for a project that discloses the potential environmental impacts of a project to the public.

EJ
Environmental Justice refers to the equitable distribution of environmental benefits and burdens.

ESA
Environmental Science Associates, a consulting firm.

EV
Electric Vehicle is a vehicle that uses an electric battery to operate.

FBC
Form-Based Code is a means of regulating land development to achieve a specific urban form.

FCEV
Fuel Cell Electric Vehicle, a vehicle that is powered by hydrogen fuel cell technology.

FERC
Federal Energy Regulatory Commission, a regulatory commission monitoring interstate aspects of the utilities industries, including: electrical power, natural gas, oil pipeline, and hydroelectric.

FY
Fiscal Year, a year as reckoned for taxing or accounting purposes.

GGRF
Greenhouse Gas Reduction Fund, an account established by the State of California to receive Cap-and-Trade auction proceeds to support programs that reduce greenhouse gas emissions.

GHG
Greenhouse Gas is a type of gas that causes heat to be trapped in the atmosphere, resulting in warming effects for the Earth.

Green Building
Sustainable or “green” building is a holistic approach to design, construction, and demolition that minimizes the building’s impact on the environment, the occupants, and the community.

Greenhouse Gas Inventory
A greenhouse gas inventory provides estimates of the amount of greenhouse gases emitted to and removed from the atmosphere by human activities.

GWh
Gigawatt hour is a unit of electricity.

GWP
Global warming potential is a relative measure of how much heat a greenhouse gas traps in the atmosphere.
HFCs
Hydrofluorocarbons are greenhouse gases.

HiAP
Health in All Policies, a document adopted by the City of Richmond to prioritize public health in future planning processes and City initiatives.

HUD
U.S. Department of Housing and Urban Development, a Cabinet department in the Executive branch of the United States federal government that was founded in 1965 as part of the “Great Society” program of President Lyndon Johnson to develop and execute policies on housing and metropolises.

HVAC
Heating, ventilation and cooling, provides interior climate conditioning within buildings.

ICLEI
International Council for Local Environmental Initiatives is an international association of local governments and national and regional local government organizations that have made a commitment to sustainable development.

IPCC
Intergovernmental Panel on Climate Change is a scientific intergovernmental body under the auspices of the United Nations.

kWh
Kilowatt-hour, a unit of electricity equivalent to one kilowatt (kW) of energy used for an hour.

LCFS
Low carbon fuel standard requires transportation fuel providers in California to decrease lifecycle fuel carbon intensity by 2020.

LEED
Leadership in Energy and Environmental Design is an internationally recognized green building certification program, which provides third party verification that a building or community was designed and built using sustainable approaches, with particular regard to energy savings, water efficiency, CO2 emissions reductions, and improved indoor environmental quality, among other criteria.

LiHEAP
Low Income Home Energy Assistance Program, a state program that provides assistance with energy costs to families in California.

MAP
Moving Ahead for Progress, a two-year federal law governing transportation that was adopted in 2012.

MCE
Marin Clean Energy, a community choice aggregation program.

MGD
Million Gallons per Day is a large-scale unit of water or wastewater flow.

MHHW
Mean Higher High Water is the average of all the high water levels observed over a period of several years.

mpg
Miles Per Gallon, provides a comparison of the fuel economy or efficiency of various transportation fuels.

MPO
Metropolitan Planning Organization, a federally mandated and funded transportation policy-making organization that is made up of representatives from local government and governmental transportation authorities.

MT CO2e
Metric tons of carbon dioxide equivalent, a unit of measurement for greenhouse gases (one metric ton equates to approximately 2,204 lbs).

MTC
Metropolitan Transportation Commission, a transportation planning, financing, and coordinating agency for the San Francisco Bay Area.

Municipal
Refers to energy use and greenhouse gas emissions from City-owned and operated facilities and equipment.

N2O
Nitrous oxide is a greenhouse gas.

NOAA
National Oceanic and Atmospheric Administration, a scientific agency within the United States Department of Commerce focused on the conditions of the oceans and the atmosphere.

NRC
National Research Council, a private, nonprofit institution in the United States founded in 1916, which produces reports that shape policies, inform public opinion, and advance the pursuit of science, engineering, and medicine.

OBAG
One Bay Area Grant, a funding approach that aligns the Metropolitan Transportation Commission’s investments with support for focused growth.
Glossary of Terms and Acronyms

OED
Office of Economic Development, which serves as California's single point of contact for economic development and job creation efforts.

OEHHA
Office of Health Hazard Assessment, a specialized department within the cabinet-level California Environmental Protection Agency with responsibility for evaluating health risks from environmental chemical contaminants.

PACE
Property-Assessed Clean Energy, a form of long-term financing that creates municipal finance districts to provide loans to homeowners and businesses for energy-efficient retrofits and renewable energy system installations. Loans are repaid through an annual surcharge on property tax assessments.

PAYT
Pay-As-You-Throw is a type of waste disposal program.

PDA
Priority Development Areas are locally identified infill development opportunity areas located near transit.

PEV
Plug-in Battery Electric Vehicle is a type of electric vehicle.

PFCs
Perfluorocarbons are greenhouse gases.

PG&E
Pacific Gas and Electric is an investor-owned energy utility.

POU
Publically owned utility, a utility company that is owned by a public agency.

ppm
Parts per million, a measurement unit of concentration.

PV
Photovoltaic refers to method of converting solar energy into direct current electricity using semiconducting materials.

RARE
Richmond Advanced Recycled Expansion, water recycling project in Richmond.

RBSP
Richmond Bay Specific Plan, a specific plan describing land uses along the City’s south shoreline.

Rebate
Offered by the state, utility, or local government to promote the installation of renewables and energy efficiency projects.

Renewable Energy
Energy from sources that regenerate and are less damaging to the environment, such as solar, wind, biomass, and small-scale hydroelectric power.

RPS
California's Renewables Portfolio Standard requires utility providers to increase the portion of generated energy that comes from renewable sources to 20 percent by 2010 and to 33 percent by 2020.

RTP
Regional Transportation Plan, a plan that identifies transportation projects to serve entire regions.

RTPA
Regional Transportation Planning Agency, a public agency in California that is tasked with transportation planning at the regional level.

SASH
Single-Family Affordable Solar Homes, a ratepayer-funded program through the California Public Utilities Commission that provides up-front rebates to help low-income homeowners access the benefits of solar power.

SB 350
Senate Bill 350 requires California to: 1) generate half of its electricity from renewable energy sources; 2) double energy efficiency for both electricity and natural gas end uses in all buildings by 2030; and 3) substantially improve the infrastructure for electric vehicle transportation.

SB 375
Senate Bill 375 enhances California’s ability to reach its AB 32 goals by planning more transportation-efficient communities.

SB 97
Senate Bill 97 requires the Governor's Office of Planning and Research (OPR) to develop and adopt CEQA guidelines for the mitigation of GHG emissions.

SCS
Sustainable Community Strategy, a comprehensive land use and regional growth strategy that serves as a companion document to a regional transportation plan.

SEEC
California State-wide Energy Efficiency Collaborative, provides no-cost resources to support the climate and energy initiatives of California local governments.

SF6
Sulfur Hexafluoride is a greenhouse gas.
Glossary of Terms and Acronyms

**SGIP**
Self-Generation Incentive Program, an incentive program provided by the Pacific Gas and Electric Company.

**SLCP**
Short-Lived Climate Pollutants, greenhouse gases that persist for a relatively short time in the atmosphere.

**SOVs**
Single occupancy vehicles, a vehicle driven by a single person.

**SSD**
Stege Sanitary District is one of three sanitary districts in the City of Richmond.

**SULEV**
Super ultra-low emission vehicle is a type of vehicle.

**TDM**
Transportation demand management is the application of strategies and policies to reduce travel demand.

**TFCA**
Transportation Fund for Clean Air, a grant program funded by a $4 surcharge on motor vehicles registered in the Bay Area.

**Title 24**
California Code of Regulations, Title 24, also known as the California Building Standards Code (composed of 12 parts). Title 24, Part 6 established California’s energy efficiency standards for residential and nonresidential buildings. See also California Building Standards.

**TOD**
Transit-Oriented Development, a mixed-use residential and commercial area designed to maximize access to public transport, and often incorporates features to encourage transit ridership.

**USEPA**
United States Environmental Protection Agency, an agency of the U.S. federal government which was created for the purpose of protecting human health and the environment by writing and enforcing regulations based on laws passed by Congress.

**UWMP**
Urban Water Management Plan, a plan prepared by California’s urban water suppliers to support their long-term resource planning, and ensure adequate water supplies are available to meet existing and future water demands.

**VMT**
Vehicle miles traveled is a measurement of vehicle travel.

**WCCUSD**
West Contra Costa Unified School District.

**WCWD**
West County Wastewater District is a utility that provides sewage conveyance and treatment in the City of Richmond.

**WestCAT**
Western Contra Costa Transit Authority is a transit agency serving City of Richmond.

**WWTP**
Waste water treatment plant is a facility that treats sewage.

**YES**
Nature to Neighborhoods is a community-based organization.

**Y-PLAN**
Youth Plan Learn Act Now is a University of California Berkeley program offering project-based civic learning experiences for youth.

**Zero Net Energy**
For buildings, use of no more energy over the course of a year than can be generated onsite through renewable resources such as solar, wind, or geothermal power.

**ZEV**
Zero-emission vehicle is a type of vehicle.
City of Richmond
Climate Action Plan
CHAPTER 1
In the last decade, cities across the globe have taken the lead in addressing climate change at the local level. Municipal and regional climate action plans are becoming standard operations across the nation, as cities have a responsibility and a unique capacity to tailor and develop programs to reduce community greenhouse gas (GHG) emissions and prepare for the impacts of climate change.

Climate change presents the City of Richmond with complex challenges and tremendous opportunities. The City is committed to creating a healthy, equitable community for all of its residents. The Richmond Climate Action Plan (CAP) is a multi-objective plan that addresses environmental, social and economic issues related to climate change. The CAP builds on the goals and policies in the City’s General Plan and the Health in All Policies Strategy (HIAP) to further the City’s efforts to build health equity through the reduction of local GHG emissions, and to simultaneously ensure that the community is well prepared for the impacts of climate change. It elevates health equity priorities in the selection of climate action measures, building on the City’s existing policy framework to support a healthy, vibrant, and equitable City.

In addition to reducing GHG emissions, successful implementation of the CAP will result in numerous co-benefits to the community, and will position the City to obtain grant funding for sustainable development programs such as affordable housing, transit-oriented development, and urban forestry.

1.1 Vision and Mission

The CAP expands and operationalizes the community vision for health equity, and energy and climate change established in the Richmond General Plan 2030. The Richmond CAP Community Vision is as follows:
Introduction

Community Vision

The City of Richmond plays a pivotal role in developing climate policy at a local level that, in turn, influences regional, state, and national objectives. The City relies on clean energy sources, waste reduction practices, sustainable buildings and innovative land use planning to reduce energy and climate impacts. These measures have resulted in broad community benefits including dramatic reductions in fossil fuel use, cost savings, emission reductions, improved health equity, water conservation, and an enhanced quality of life. City officials and community members value and protect natural resources and continue to work together to reduce the impacts of a changing climate. A renewed focus on education and local and regional partnerships further supports sustainable practices that will nurture human health and environmental quality for future generations. The City builds resiliency to climate change impacts through actions focused on transitioning to renewable energy, strengthening critical transportation infrastructure, creating safe and affordable housing, enhancing local jobs and wages, creating healthy local food systems, and protecting natural resources and habitat.

Co-benefits of Implementing the City of Richmond Climate Action Plan

- Improve community health and air quality
- Increase investment in homes and buildings
- Complete streets and increased urban tree canopy
- Conserve water and other natural resources
- Increase home and building values
- Create local/green jobs
- Reduce utility bills and maintenance costs
- Increase educational and training opportunities
- More resilient infrastructure prepared for climate change impacts
In support of this vision, the mission of the Richmond CAP is to serve as a roadmap for how the City will reduce GHG emissions, create local jobs, and prepare for the impacts of climate change on public health, infrastructure, ecosystems, and public spaces in our community. The CAP supports the community’s goals and policies in the City’s General Plan, and builds upon other local policies such as the Health-in-All-Policies Strategy. It also enables the City to implement strategies that successfully fulfill the requirements of state initiatives Assembly Bill 32 (AB 32) and Senate Bill 375 (SB 375).

1.2 Goals
The Richmond CAP is founded on four overarching goals that represent the aim or desired result of climate action planning in the City.

1. **GHG Emissions Reduction:** The City is committed to substantially reducing GHG emissions originating from the community and from its government operations. The City will contribute its fair share of emissions reduction needed to achieve statewide targets and reduce the societal and environmental risks associated with climate change.

2. **Healthy and Resilient Community:** Richmond is committed to sustainable growth that provides a healthy, resilient and equitable environment for all. Richmond will continue to invest resources in residents, businesses, infrastructure, and public spaces to better prepare for the impacts of climate change. Every resident should have access to walkable neighborhoods, and good jobs. Homes must be safe, affordable, and efficient, and resilient urban trees and green space should be located throughout the city.

3. **Prosperous Local Economy:** The City will work with the local business community to capitalize on emerging clean technology economic opportunities in energy, transportation, land use, and general consumption. Local jobs creation will create more employment options and reduce the need to commute by City residents to distant employment centers.

4. **Engaged Community and Educated Youth:** Students, residents, and businesses are essential partners in confronting the climate change challenge. An engaged community is more cohesive and capable of achieving City climate program goals in energy efficiency, waste reduction, water conservation, sustainable transportation, and sustainable resources such as community gardens and healthy food. In Richmond's youth lies its foundation for a sustainable and resilient future. Young people empathize and embrace climate-smart behaviors, and are empowered to take ownership of Richmond’s future as active citizens within the local climate change policy decision-making processes.

1.3 CAP Development Process
The Richmond CAP is the culmination of several years of work within the City, and organizes the City’s past and future path with that of the growing state and worldwide movement to address the causes of human-induced climate change.

In 2007, the City signed the U.S. Mayors Climate Protection Agreement, a pledge to meet the Kyoto Protocol’s goal to reduce GHG emissions to 1990 levels by 2020. In 2009, the City published its 2005 baseline GHG inventory as a first step to understand its sources of GHG emissions across the community. That same year, Richmond became a member of ICLEI: Local Governments for Sustainability, an international network for municipalities dedicated to addressing climate change. In 2008, the City Council adopted Resolution 108-08 committing to the GHG emissions target established by AB 32, and to achieving an 80 percent reduction below 1990 levels by 2050.

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**Assembly Bill 32 (AB 32)**
California’s Global Warming Solutions Act of 2006, or AB 32, seeks to fight climate change through a comprehensive program reducing GHG emissions from virtually all sources statewide. The landmark law requires the California Air Resources Board (CARB) to develop regulations and market mechanisms that will cut statewide GHG emissions to 1990 levels by 2020.
Richmond strengthened its commitment to climate action in 2012 with the adoption of an Energy and Climate Element into the City’s General Plan 2030 update, which seeks to recognize and responsibly address the impacts of climate change. Developing a CAP is an implementing action of the General Plan.

Preparation of the Richmond Draft CAP began in earnest in 2013, and commenced with a community workshop to discuss the CAP with partners from UC Berkeley. The City collaborated with the UC Berkeley School of City Planning and Public Health to develop a 2012 update of the GHG inventory, survey current best practices for the Plan, and evaluate policy synergies with state and federal initiatives. In 2014, the City also sought input on CAP strategies and actions from 250 Richmond High School students via the Youth Plan Learn Act Now (Y-PLAN) Program, sponsored by the UC Berkeley Center for Cities + Schools and the City of Richmond. The Y-PLAN program analyzed what actions residents, businesses, schools, and the City could undertake to reduce greenhouse gas emissions.

In 2015, the City held two additional community workshops and hosted three luncheons with stakeholders representing community-based organizations, businesses, and utilities, franchisees, and industry groups. These events provided ample opportunity for stakeholder input, informed the strategies and actions included in the CAP, and helped identify and strengthen important partnerships for pursuing funding and implementing the CAP.

The City also held meetings with The Bay Area Regional Collaborative (BARC), Bay Area Air Quality Management District (BAAQMD), Association of Bay Area Governments (ABAG), Metropolitan Transportation Commission (MTC), The Bay Conservation and Development Commission (BCDC), and UC Berkeley’s School of Public Health. These meetings were designed to capture important stakeholder concerns regarding the City’s climate action planning, to help align the CAP with regional transportation plans, state and regional climate programs, and funding opportunities.

This CAP reflects the vast breadth and depth of input received at these events and through these programs. Appendix A includes the City’s CAP Community Engagement Plan, as well as a summary of input received during community and stakeholder engagement events. Appendix E provides a timeline of state and local actions to date that address climate change.

1.4 Relationship to Other City Plans

The City of Richmond understands that addressing climate change goes beyond environmental concerns. Efforts to reduce GHG emissions and improve resilience to climate change will improve the local economy, sustainability, health, and well-being of the entire community. The City is continuously working to address climate change through policy, and has adopted numerous plans and strategies that directly or indirectly support climate action. The Richmond CAP was influenced by, and builds upon, these plans and strategies, including the City’s General Plan, the Health in All Policies Strategy (HIAP), Draft Urban Greening Master Plan, Parks Master Plan, Richmond Bicycle Master Plan, and Richmond Pedestrian Plan. The CAP not only directly supports policies within these plans, it provides actions that implement requirements of these policies.
1.5 Relationship to State Policies on Climate Change

Many strategies for monitoring and addressing climate change have emerged at the international, national, and state levels. California remains a leader in the effort to reduce GHG emissions through mitigation and adaptation strategies. With AB 32, California became the first state in the U.S. to mandate GHG emissions reductions across its entire economy. To support AB 32, California has been developing policy and passing legislation that seeks to control emissions of gases that contribute to climate change. These have included regulatory approaches such as mandatory reporting for significant sources of GHG emissions and caps on emission levels, as well as market-based mechanisms, such as the state’s Cap and Trade program. The state policies and regulations most relevant to the Richmond CAP are briefly described below.
Richmond Health in All Policies Strategy (HiAP)

The City is fully committed to achieving the highest level of health for all Richmond residents. The City’s HiAP Strategy reflects this pledge to health equity by integrating health and wellness throughout City policy, programs, and operations. The HiAP Strategy established the following two, interrelated goals: 100% health equity and 0% health inequities. The City defines health equity as attaining the highest level of health for all people, while describing health inequity as differences in health that are unfair and unjust. Environmental conditions, socioeconomic conditions, and other root causes contribute to health inequity.

Health Equity is incorporated into the CAP in the following ways:

- **Commitment to Health Equity:** The City’s vision for a healthy, climate-resilient City includes a commitment to improving the overall health of all its residents (health equity) by implementing GHG reduction measures that also address unnecessary and unjust health burdens faced by some of its most disadvantaged residents (health inequities).

- **Strategies and Actions:** The CAP includes specific strategies and actions that work towards these goals by:
  - Encouraging physical activity through bicycle and pedestrian infrastructure.
  - Advancing state, regional, and local efforts to reduce GHG emissions, criteria pollutants, and short-lived climate pollutants through enforcement of existing emission regulations.
  - Supporting local agriculture and food production to ensure residents have better access to healthy local foods.
  - Building healthy schools through partnerships to reduce energy and water consumption, and increase solid waste diversion.
  - Developing partnerships with community-based organizations that support workforce development and green jobs.
  - Targeting specific programs such as energy efficient upgrades and solar installation to low-income facilities.
  - Encouraging safe, affordable, and healthy housing.

Executive Order S-3-05

Executive Order (EO) S-3-05, signed on June 1, 2005 by Governor Arnold Schwarzenegger, set the stage for multiple legislative actions to reduce GHG emissions in California. EO S-3-05 established the following statewide GHG emissions targets:

- By 2010, reduce GHG emissions to 2000 levels;
- By 2020, reduce GHG emissions to 1990 levels; and
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

EO-S-3-05 provided the basis for subsequent regulation to reduce GHG emissions, including AB 32 and SB 375 (described below). It also created the California Climate Action Team (CAT), which is tasked with preparing biennial science assessment reports on climate changes and adaptation options for California.
Richmond General Plan 2030

On April 25, 2012, the Richmond City Council adopted a new General Plan to guide the City’s sustainable growth and development. The General Plan provides a comprehensive framework for developing a healthy city and healthy neighborhoods.

The Energy and Climate Change Element of the General Plan provides Richmond’s community vision for energy and climate in 2030. The element examines how the City’s land use and transportation network will affect energy consumption and determines what measures can be implemented to reduce greenhouse gas emissions. The element also provides policy direction for protecting energy resources and responding to climate change, and provides goals, policies, and actions to address energy conservation, renewable energy generation and use, sustainable business development, and responsible community revitalization.

The Richmond CAP stems from, and supports implementation of these General Plan goals, policies, and actions. The first goal in the Energy and Climate Change Element is “Leadership in Managing Climate Change” (Goal EC1). General Plan policies supporting this goal include:

- Policy EC1.1 Leadership and Advocacy: Take a leadership role in advocating for local, regional and national solutions to climate change at all levels of government and with the private sector.
- Policy EC1.2 Public Awareness and Support: Provide incentives to encourage residents and businesses to reduce their carbon footprint by raising their awareness about the impacts of climate change and by building support for climate change initiatives in Richmond and the greater region.

Moreover, the structure and content of the CAP meet the directive of General Plan Action EC1A, which calls for development of a CAP for reducing GHG emissions to meet or exceed state reduction targets.

Assembly Bill 32 – California Global Warming Solutions Act of 2006

AB 32 was approved by the legislature and signed by Governor Schwarzenegger in 2006. The landmark legislation requires the state to reduce GHG emissions to 1990 levels by 2020 and directs the California Air Resources Board (CARB) to develop the plans, programs, and regulations needed to achieve reductions in a technologically feasible and cost-effective manner. Under the legislation, CARB is mandated to:

- Identify early action items that can be quickly implemented to achieve GHG reductions. These early action items were adopted by CARB in 2007 and include regulations affecting landfill operations, motor vehicle fuels, car refrigerants, and port operations, among other regulations.
- Create and adopt regulations that require the state’s largest industrial emitters of GHGs to report and verify their emissions on an annual basis.
- Develop and maintain a Climate Change Scoping Plan to identify the most technologically feasible and cost-effective measures to achieve the necessary emissions reductions to reach 1990 levels by 2020. The first Scoping Plan,¹ adopted in 2008, put forth a variety of programs, regulations, incentives, and market-based mechanisms to reduce GHG emissions across the state, including:
  - Expanding and strengthening existing energy efficiency programs;
  - Achieving a statewide renewables energy mix of 33 percent for electricity generation;

¹ CARB 2008 Scoping Plan. Available at http://arb.ca.gov/cc/scopingplan/scopingplan.htm
Introduction

- Developing a California Cap and Trade program affecting major industrial facilities and power plants in the state as well as companies that import power from other states for sale in California;
- Establishing targets for transportation-related GHGs for regions throughout California and pursuing policies and incentives to achieve those targets;
- Adopting measures pursuant to existing laws including clean car standards and low carbon fuel standards;
- Creating targeted fees on high global warming potential gases and a fee to fund the administrative costs of the state’s long term commitment to AB 32 implementation; and
- Adopting measures to increase commercial recycling.

CARB’s 2014 update to the Climate Change Scoping Plan outlined the challenges to reducing statewide GHG emissions to 80 percent below 1990 levels by 2050, clarified the role of local governments in reducing GHG emissions within their jurisdictions, and highlighted the need for targeted investment, new policy developments, and rapid market uptake of new technologies in transportation, energy, agriculture, water, waste management and land management. The next update to the Scoping Plan, due to be released in late 2016, is expected to include new program and policy details that will demonstrate how the state expects to meet its long-term GHG targets.

Senate Bill 97 – California Environmental Quality Act (CEQA) Guideline Amendments of 2007

Senate Bill (SB) 97 amends the CEQA Guidelines to address GHG emissions. Local governments may now use adopted plans consistent with the amended CEQA Guidelines to assess the cumulative impacts of projects on climate change, if the plan for the reduction of GHG emissions accomplishes the following:

- Quantifies GHG emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;
- Establishes a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable;
Identifies and analyzes the GHG emissions resulting from specific actions or categories of actions anticipated within the geographic area;

Specifies measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level;

Establishes a mechanism to monitor the plan’s progress toward achieving the specified emissions level and to require an amendment if the plan is not achieving it; and

Is adopted in a public process following environmental review.

SB 375 – Sustainable Communities and Climate Protection Act of 2008

SB 375, also known as the Sustainable Communities and Climate Protection Act of 2008, builds off of AB 32 and aims to reduce GHG emissions by linking transportation funding to land use planning. It requires the state’s metropolitan planning organizations (MPOs) to create a sustainable communities strategy (SCS) in their regional transportation plan (RTP) for the purpose of reducing urban sprawl and reliance on automobiles. Under SB 375, CARB established for each MPO a regional target for GHG emissions reductions from passenger vehicle use. The regional GHG reduction targets for the Metropolitan Transportation Commission (MTC) region, which is the MPO with jurisdiction over Richmond, are 7 percent per capita by 2020 and 15 percent per capita by 2035 from 2005 levels.²

Executive Order B-30-15 calls on CARB to update the AB 32 Climate Change Scoping Plan to incorporate the 2030 statewide target. In June 2016, CARB released a 2030 Draft Scoping Plan Update concept paper describing policy scenarios for achieving the target. The scenarios present the various ways in which industrial emissions could be reduced (e.g., cap & trade, carbon tax, new regulations) and how aggressive the state would need to be in expanding the use of zero emission and plug-in hybrid vehicles by 2030. All scenarios call for enhancing reductions from existing programs (e.g., increase the use of zero emission and plug-in electric vehicles) along with aggressive implementation of existing policies like SB 350 and the state’s Proposed Short-Lived Climate Pollutant (SLCP) Reduction Strategy. Although the paper states that local actions are critical for implementation of California’s ambitious climate agenda, there is no specific guidance for setting post-2020 reduction targets for local climate action plans. The City is expecting more concrete guidance from the state with the eventual release of the 2030 Scoping Plan Update later in the year.

Senate Bill 535 – Greenhouse Gas Reduction Fund and Disadvantaged Communities (2012)

SB 535 requires the California Environmental Protection Agency (CalEPA) to identify disadvantaged communities, and requires that 25 percent of all funds allocated pursuant to an investment plan for the use of state moneys collected through a Cap and Trade program be allocated to projects that benefit disadvantaged communities and at least 10 percent of the 25 percent to be spent on projects located in disadvantaged communities.

Senate Bill 350

In October 2015, the California legislature passed the Clean Energy and Pollution Reduction Act of 2015 (SB 350), requiring the State to 1) generate half of its electricity from renewable energy sources; 2) double energy efficiency for both electricity and natural gas end uses in all buildings by 2030; and 3) substantially improve the infrastructure for electric vehicle transportation.

Executive Order B-30-15

On April 29, 2015, Governor Jerry Brown signed Executive Order (EO) B-30-15 to establish an interim GHG emission reduction target to reduce GHG emissions to 40 percent below 1990 levels by 2030. This new target represents the most aggressive goal set by any government in North America to reduce GHG emissions by 2030. The EO also establishes a climate adaptation directive for state investments and agencies, and requires state agencies to “take current and future climate change impacts into account” and consider “full life-cycle cost accounting” when making future planning and investment decisions, particularly as applied to infrastructure planning.
OPPORTUNITIES AND CHALLENGES

Climate change presents the City with enormous challenges and tremendous opportunities. Taking meaningful action on climate change can mean challenging the status quo and questioning long-held beliefs. But the urgent need to take action provides the City with a unique opportunity to build a thriving community based on sustainable, equitable and resilient systems. This chapter provides a summary of the science behind climate change and the local impacts expected in Richmond. It introduces the City’s primary vulnerabilities to climate change, describes the nexus between climate change and public health, and concludes with a discussion of the economic opportunities associated with reducing emissions and increasing community resilience.

2.1 Building a Better Community in the Face of Climate Change

Climate change is happening, as evidenced by larger, more powerful storms, changing precipitation patterns, and rising seas. Climate change is a challenge that demands action in both reducing greenhouse gas (GHG) emissions to minimize future hazards, and investing in resilience and adaptation measures for the impacts we are experiencing now and expect to worsen in the coming decades.

Although climate change presents serious long-term challenges to the City of Richmond, it also presents opportunities. For example, strategies to dramatically reduce community-wide GHG will also invest in homes and infrastructure and provide public health benefits. Strong public policy that provides funding for climate change mitigation and adaptation has multiple benefits. By investing in skilled workers and new low carbon technologies like clean energy, renewable materials, and bio-based fuels, the City can develop new engines for job growth and sustainable economic prosperity. By investing in adaptation strategies, such as flood and tidal defenses, the City can lessen the impact of future natural disasters while simultaneously driving economic growth by strengthening infrastructure. By instituting public health measures to deal with heat waves, and air quality impacts, the City can plan for climate change in a way that protects vulnerable populations and provides an equitable distribution of costs, benefits, and opportunities for all members of the Richmond community.
2.2 Greenhouse Gases and their Impact on Climate

The Greenhouse Effect is a natural phenomenon whereby greenhouse gases trap heat in the atmosphere and regulate the Earth's temperature. This natural effect is responsible for maintaining a habitable climate, but over the last century human activities have greatly increased atmospheric concentrations of greenhouse gases. According to the Intergovernmental Panel on Climate Change (IPCC), it is very likely that this increase of human-generated GHG emissions, which has accelerated since the mid-20th century, is a primary cause of climate change. Atmospheric concentrations of GHG emissions now far exceed the average of the past several thousand years. Land use changes, burning of fossil fuels, and agricultural practices have all contributed to this observed increase. Global climate models clearly show that human activity is having an effect on global temperatures.

Figure 2-1: The Greenhouse Effect

The most prevalent GHGs are carbon dioxide (CO2) and water vapor. Others important GHGs are methane (CH4), nitrous oxide (N2O), chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6). These gases are emitted through a variety of natural processes and human activities, as follows:

- CO2 and N2O are byproducts of fossil fuel combustion;
- N2O is associated with agricultural operations, such as fertilization of crops;
- CH4 is commonly created by off-gassing from agricultural practices (e.g., manure from cows), anaerobic composting, and landfills;
- CFCs were widely used as refrigerants, propellants, and cleaning solvents; their production has been mostly eliminated by international treaty, but past emissions remain in the atmosphere due to their long lifespan;
- HFCs are now used as a substitute for chlorofluorocarbons in refrigeration and cooling; and
- PFCs and SF6 emissions are common byproducts of industries such as aluminum production and semiconductor manufacturing.

**Figure 2-2: Impact of Sea Level Rise on City of Richmond Transportation and Energy Assets**
Opportunities and Challenges

The City of Richmond has also completed its first Climate Change Adaptation Study (see Appendix F) which includes an evaluation of climate change impacts at the local scale and a vulnerability and risk assessment of the City’s most important assets to rising temperatures, rising seas, extreme weather events, and more extreme droughts.\(^1\) The methodology used to develop the City’s Adaptation Study expands on the Adapting to Rising Tides (ART) methodology\(^2\) developed by the Bay Conservation and Development Commissions (BCDC) and National Oceanic and Atmospheric Administration (NOAA) Coastal Services Center, to evaluate how San Francisco Bay Area communities can adapt to sea level rise and storm event flooding. The findings from the City of Richmond Climate Change Adaptation Study, which incorporate a wide range of analyses done for the Contra Costa County ART Project,\(^3\) are summarized in the following sections.

**Rising Seas**

Historical records show that sea level in San Francisco Bay has risen more than 7 inches (18 cm) over the past 100 years. Scientists agree that the rate of sea level rise is accelerating, but projections of future sea levels vary considerably. The State of California has adopted sea level rise projections for the San Francisco Bay region from the National Research Council (NRC), which includes an allowance for vertical land motion (tectonic uplift, or subsidence from compaction of sediments). For the Bay Area, the NRC projects 11 inches of sea level rise (measured at Mean Higher High Water, or MHHW) over current levels by 2050 (with a range of 5 to 24 inches) and 36 inches by 2100 (with a range of 17 to 66 inches by 2100). The Contra Costa County ART Project mapped these sea level rise scenarios, as well as higher Bay water elevations ranging from 77 to 108 inches above MHHW. These higher levels are above current predictions for sea level rise likely to occur before 2100, but they illustrate short-term flooding that could occur in that time frame when extreme tides are coupled with SLR. For example, 77 inches above MHHW is approximately equal to a 36-inch sea level rise plus 100-year extreme tide.

As described in the Adaptation Study, critical infrastructure including roads, railways, and wastewater treatment plants are vulnerable to sea level rise and coastal flooding, as are recreational areas at Point Isabel Recreational Shoreline, Miller Knox Regional Shoreline, and Point Pinole Regional Shoreline. Figure 2.2 illustrates the anticipated impact of sea level rise on transportation and energy assets in the City of Richmond, using a projection of 77 inches above MHHW (equivalent to 36-inch sea level rise plus 100-year extreme tide). Chevron refinery is located in a high risk area for sea level rise, as is the Port of Richmond, and critical stretches of important highways and rail lines.

**Rising Temperatures**

California in general expects overall hotter conditions for both average and extreme temperatures. An increase in heat waves and wildfires are expected to be among the earliest climate impacts experienced across the state.\(^4\) According to the State’s climate adaptation planning tool known as Cal-Adapt, the City of Richmond area can expect to experience a rise in average annual temperature of about 3 to 6 degrees Fahrenheit above the historical average by the end of the century. Urban areas with lots of pavement and few trees will tend to heat up even more. Though extreme heat events in coastal areas like Richmond are not expected to be as severe or as long-lasting as further inland, the residents of these historically cooler areas are less accustomed to hot weather and may not be as well prepared or equipped to deal with it. Air conditioning is far less common, for example. Outdoor workers, elderly populations, and infants are particularly vulnerable to extreme temperatures.\(^5\)

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2. San Francisco Bay Conservation and Development Commission (BCDC) and the NOAA Coastal Services Center, 2011: Adapting to Rising Tides; project information and resources available at [http://www.adaptingtorisingtides.org/](http://www.adaptingtorisingtides.org/)
3. Project information available at: [http://www.adaptingtorisingtides.org/project/contra-costa-county-adapting-to-rising-tides-project](http://www.adaptingtorisingtides.org/project/contra-costa-county-adapting-to-rising-tides-project)
Opportunities and Challenges

Precipitation and Drought

Climate models indicate that the San Francisco Bay Area is likely to continue with its Mediterranean climate of cool wet winters and hot dry summers, but that conditions will be drier than the historical average in the second half of the century. While average conditions may be drier, the expectation is that more intense downpours will occur during a somewhat shorter rainy season. Since the City already has an arid climate, it is sensitive to a decrease in annual local precipitation, which can cause local drought, impacting local flora and contributing to wildfire risk. An increase in local precipitation during extreme storms can increase the peak storm runoff, thereby increasing the risk of flooding due to the overtopping of stormwater channels, pipes, pumps, and creeks.

Regional changes in precipitation and temperature patterns present a long-term risk to the City’s water supply. Climate models predict reductions in the average annual Sierra snowpack with a shift in snowmelt runoff to earlier in the year, changes in the timing, intensity and variability of precipitation, and an increased amount of precipitation falling as rain instead of as snow.

Long-term changes in watershed vegetation and increased incidence of wildfires could affect water quality in local reservoirs. Higher temperatures would also increase evaporation, which in turn would increase irrigation demand.

2.3 Vulnerabilities and Potential Consequences in Richmond

In its recently published update to the California Climate Adaptation Strategy, the California Natural Resources Agency outlines the significant climate change impacts facing the Bay Area, including sea level rise, public health problems arising from more extremely hot days and poorer air quality; longer and more intense wildfire conditions; more frequent droughts with possible disruptions in fresh water supplies; and vastly different natural resource conditions. The report emphasizes the unprecedented levels of leadership and cooperation needed amongst multiple stakeholders to effectively address adaptation.

The local impacts on climate described in the prior section will affect community infrastructure and resources. The City of Richmond Climate Change Adaptation Study assesses vulnerabilities for the following eleven categories of community assets, which include City-owned or operated facilities deemed critical for operations, utility services, and risk management, and other tangible and non-tangible assets that are important to community health, safety, and well-being. Assets are categorized as follows:

1. Community Services and Public Facilities
2. Public Health
3. Housing
4. Water Supply
5. Wastewater Management
6. Stormwater Management
7. Transportation Infrastructure
8. Shoreline Flood Management
9. Energy Security and Infrastructure
10. Solid Waste/Hazardous Materials Management
11. Natural Areas/Ecosystems/Recreation Assets
12. Commercial and Industrial Assets

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7 San Francisco Bay Area Integrated Regional Water Management Plan, September 2013. Available at: [http://bairwmp.org/](http://bairwmp.org/)

Richmond’s greatest risks related to climate change result from the City’s shoreline, the inherent sensitivities of its Mediterranean climate, and its dependence on imported water from the distant Sierra Nevada as its primary water supply. Some of the City’s most critical assets are located in close proximity to the low-lying shoreline where risk of damage or disruption from sea level rise is significant. These include wastewater treatment facilities, stormwater management infrastructure, residential neighborhoods, the Chevron Refinery and other industrial areas including the Port of Richmond, highways, rail lines, emergency response facilities, and parks. Climate change is expected to bring hotter and drier summers and winter storms that are predicted to be fewer in number but higher in intensity. These changes can stress natural habitats and public health while posing a potentially serious risk to the long-term reliability of the City’s potable water supply.

Based on this study, the City-owned and community assets at highest risk from climate change by the year 2100 include the following:

1. Property and infrastructure located in areas along the bay shore prone to coastal flooding. Current levees are not designed to protect these assets from sea level rise;
2. The City’s long-term potable water supply, which is largely dependent on runoff from the Sierra Nevada Mountains, especially during dry years;
3. Road transportation assets including streets and highway approaches that are located in flood-prone areas near the bay shore;
4. The health and well-being of the most vulnerable of the City’s residential populations, and its natural inhabitants (flora and fauna), which can experience severe stress from extreme heat, drought and extreme precipitation events; and
5. Parks, roads and residential areas in the Richmond Hills that become increasingly high risk zones for wildfires by the year 2100.

Richmond is already engaged in multiple planning efforts that address some or all of these risks. However, the Adaptation Study represents the City’s first widely coordinated effort to identify and document vulnerabilities across a broad range of community assets, and assess the risk of climate-related impacts to those assets over near-term (to 2050) and longer-term (to 2100) planning horizons.

2.4 Climate Change and Public Health

Climate change presents a significant risk to community health. More extreme weather events, worsening air quality, and increased transmission of infectious disease may negatively affect human health, health behaviors, and the socio-economic factors that influence health outcomes. Some existing health threats may intensify, while new health threats may emerge. The impacts of climate change will not affect everyone equally. It is expected that already burdened and vulnerable populations, such as the elderly, infants and children, minority communities, and people living in poverty, will be disproportionately impacted by climate change. Fortunately, many of the actions that address climate change also improve the health and wellbeing of vulnerable communities, helping to address the existing, unequal health burdens faced by some of the City’s most disadvantaged residents.

Health Effects and Vulnerable Populations

Climate change, together with other stressors, is expected to impact many facets of public health. Extreme heat, poor air quality, sea level rise, and regional drought may negatively affect human health, health behaviors, and the socio-economic factors that influence health outcomes. For example, extreme heat can cause premature death, cardiovascular stress or failure, and heat-related illness such as heat stroke, heat exhaustion, and kidney stones. Air pollution can cause increased asthma attacks, allergies, chronic obstructive pulmonary disease, and other cardiovascular and respiratory diseases. Any of these stressors can lead to mental health disorders such as depression, anxiety, Post-traumatic Stress Disorder (PSD), substance abuse, and other conditions.
The City's most vulnerable populations (the elderly, low-income families, communities of color, and individuals already suffering from chronic diseases) face significant risk from extreme heat events. These populations will also face higher risk of health problems from worsening air quality and new disease vectors. The City has an important role, in partnership with public agencies and community-based organizations, to educate and engage the public on climate change issues, and to promote community involvement in actions to reduce climate change risks, using linguistically and culturally appropriate approaches that are effective for diverse populations.

Health Co-benefits

Climate change will have significant health impacts and it is important that people are prepared to mitigate and adapt to our changing climate. Many climate change mitigation and adaptation efforts can bring multiple health co-benefits to Richmond residents. For example, reducing vehicle miles traveled by increasing safe and accessible walking and bicycling infrastructure can increase physical activity, reduce air pollution, and decrease injury collisions. Corresponding health co-benefits include reductions in chronic disease, obesity levels, and respiratory diseases, and improvements in mental health.

Promoting local agriculture and food systems can increase access to healthy and fresh foods, reduce upstream energy use, and increase local social cohesion. Urban greening is another strategy that helps reduce energy use, moderate temperature and the urban heat island health effect, reduce air and noise pollution, and enhance safety. Likewise, having access to urban green space can improve physical and mental health.

Finally, climate actions can indirectly improve health. Actions that reduce residential building energy use can reduce household energy cost and promote healthy homes while at the same time creating local green jobs with living wages. Better employment, housing, and other physical environment factors are all factors that affect health and wellbeing.

Climate Change and Health Equity

Climate change will act as a stress multiplier for many existing health problems which already disproportionately impact low-income populations and communities of color in Richmond. While climate change is expected to affect environmental conditions such as temperature and air quality, which can result in more illness and injury, it is also expected to impact socio-economic conditions and access to basic goods and services, such as health care, food, and housing, exacerbating existing cumulative stresses.
Opportunities and Challenges

The map in Figure 2.3 shows the existing, disadvantaged communities in Richmond designated by California Environmental Protection Agency (CalEPA) for the purpose of implementing SB 535, which allocates twenty-five percent of available moneys in the State’s Greenhouse Gas Reduction Fund (GGRF) to projects that provide benefits to disadvantaged communities.\(^9\) These areas are disproportionately affected by environmental pollution and other hazards that can lead to negative public health effects, exposure or environmental degradation. Their location is determined by CalEnviroScreen 2.0,\(^10\) a screening tool that uses a set of twenty-one indicators to identify communities most burdened by pollution from multiple sources and most vulnerable to its effects, taking into account their socioeconomic characteristics and underlying health status. These areas tend to have high concentrations of people with low income, high unemployment, low levels of home ownership, high rent burden, health sensitivities, or low levels of educational attainment. Communities in North Richmond, Central Richmond, and the Richmond Annex are among those designated by these criteria as Disadvantaged Communities.

**Figure 2-3: Disadvantaged Communities in Richmond**

Actions focusing on the most burdened and vulnerable communities can help alleviate existing health and social inequities by helping to address some of the upstream root causes of those inequities. As opportunities to build local capacity, engage and empower the community, and implement cross-sector partnerships are integrated into the City’s climate change efforts, the CAP will be leveraged to maximize health co-benefits and reduce existing inequities. Furthermore, by strengthening local capacity to respond to natural hazards when they occur, the City can reduce the number and severity of injuries and illnesses when they do happen.

### 2.5 Economic Opportunities

The City is already home to many prominent, innovative green businesses and clean tech companies, and is poised to be a new center of innovation in the low carbon economy. Studies conducted by CARB and others show that economic growth does not have to be compromised to achieve deep reductions in GHG emissions in line with the state’s goal of 80 percent below 1990 levels by 2050.\(^11\) The state is committed to meeting this challenge through innovation and investment that will drive technology development and advance social progress. Recent legislation and policy developments are providing clear signals that the transformation to a low carbon economy is upon us, encouraging businesses to invest in clean technology and develop products and services that do not come at the expense of future generations, but instead, provide even more opportunity for growth in the future.

Achieving GHG reductions of this magnitude requires innovation and investment in energy, transportation, agriculture, water, waste management, and land management. It also requires scaling up the market adoption of new technologies in these sectors. Already, public and private investment in new technologies has reaped broad economic benefits for the state along with significant GHG reductions. Energy policies in particular have enabled the state to emerge

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\(^10\) CalEnviroScreen is the state’s Environmental Health Screening Tool used to help identify California communities that are disproportionately burdened by multiple sources of pollution. CalEPA has used the tool to designate California communities as disadvantaged pursuant to Senate Bill 535.

\(^11\) California Air Resources Board (CARB), 2014: First Update to the Climate Change Scoping Plan, May 2014.
as the national leader in both clean energy jobs and clean energy investment. Title 24 and other energy standards have saved Californians $74 billion in energy costs since 1977. California has the fourth lowest per-capita energy-related GHG emissions in the country and produces on average twice as much economic value for every unit of electricity used. The state’s AB 32 Scoping Plan Update references multiple studies that show how businesses in the U.S. could collectively cut energy-related GHG emissions by more than 20 percent by 2020, and generate hundreds of billions of dollars in net savings.\textsuperscript{13}

New economic opportunities will continue to emerge as state and regional agencies direct investment, policy and planning towards reducing GHG emissions. Electrification of the transportation and building sectors, decarbonization of electricity supply, and designing new buildings to be net energy producers are just three examples of the transformative developments required for the state to meet its long term GHG targets. Many of the technologies needed to accomplish these outcomes are cost-competitive and available today. As technologies improve and supporting infrastructure becomes available, costs will come down, accelerating market uptake and saving consumers money that will be re-directed elsewhere into the economy.

The City of Richmond recognizes future business growth opportunities in the bioscience and green/clean technology sectors and has set has set a long-term vision to be nationally recognized for business development in these sectors. Richmond has an abundance of marketable assets that position it for growth in the low-carbon economy, including robust transportation and transit networks, proximity and partnerships with world-class universities and urban innovation centers, and relatively affordable real estate.\textsuperscript{14}

2.6 The Role of State and Regional Action

The Richmond CAP contains many strategies and actions designed to enhance and leverage existing State policies and programs. Building on the State’s existing policies and programs improves the effectiveness of the CAP and increases State funding opportunities.

The State is providing an important leadership role in climate protection through policy development, planning, regulations, research, legislation, and funding programs. California has established a broad framework, across all sectors of the economy, to reduce GHG emissions to 80 percent below 1990 levels by 2050. This framework, outlined by the California Air Resources Board (CARB) in the Climate Change Scoping Plan Update of 2014, identifies the following six sectors that must undergo profound transformation in order for the State to meet its 2050 goal:

1. Energy
2. Transportation (Vehicles/Equipment, Land Use, Fuels, and Infrastructure)
3. Agriculture
4. Water
5. Waste Management
6. Natural and Working Lands

\textsuperscript{12} California Air Resources Board (CARB), 2014: First Update to the Climate Change Scoping Plan, May 2014.

\textsuperscript{13} City of Richmond Marketing Plan, 2013, by Social Sector Solutions (S3), a project of the UC Berkeley Haas Business School MBA program.

\textsuperscript{14} California Energy Commission web site, accessed November 28, 2015: http://www.energy.ca.gov/efficiency/savings.html
California’s Scoping Plan measures are designed to reduce State-wide emissions from each of these sectors. State measures include developing new policies, supporting emerging technologies, and growing the markets for those technologies. Market transformation is a recurring theme of the Scoping Plan Update, which acknowledges the role that the State must play in developing infrastructure and commercial markets for low-carbon solutions to grow to the scale required. Convergence of technologies and market objectives is needed across multiple sectors and will require integrated planning among dozens of State agencies as well as closely coordinated efforts with locally-driven GHG reduction efforts, such as the City of Richmond CAP.

Many of the State’s transportation measures, including the Advanced Clean Car standards and the Low Carbon Fuel Standard (LCFS), are designed to achieve consistent GHG reductions statewide by increasing vehicle efficiency and reducing the carbon intensity of fuels. These measures have been incorporated into the City’s forecasted GHG emissions through the year 2050.

California’s energy policies have enabled the State to emerge as the national leader in both clean energy jobs and infrastructure investment. With respect to energy, California has the fourth lowest per-capita emissions in the country and produces on average twice as much economic value for every unit of electricity used. The State adopted SB 350 in 2015 establishing requirements that by the year 2030 the State’s buildings increase energy efficiency by 50 percent, and electricity be generated from 50 percent renewable energy sources. The Richmond CAP builds on these policies, facilitates effective implementation within the City, and in some cases goes beyond the State’s standards and policy goals to achieve deeper reductions.

As described in CAP Chapter 1, Introduction, the Sustainable Communities and Climate Protection Act of 2008 (SB 375) aims to reduce GHG emissions from cars and light-duty trucks by incentivizing denser development that reduces urban sprawl. Plan Bay Area is the Region’s required Sustainable Communities Strategy (SCS), which demonstrates how the Bay Area region will integrate transportation, land-use and housing to reduce GHG emissions. Plan Bay Area concentrates approximately 80 percent of housing growth and 66 percent of job growth in Priority Development Areas (PDAs). A majority of PDAs are infill development areas located near existing or planned public transit, and in communities where there is local commitment to develop more housing. The One Bay Area Grant (OBAG) program associated with Plan Bay Area provides discretionary funds geared toward transit-oriented housing projects and transportation infrastructure that supports growth in the PDAs. These funds can be spent on infrastructure items such as new bicycle lanes and more pedestrian-friendly sidewalks. Transportation and land use strategies in the CAP are geared toward leveraging the OBAG program.

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15 Association of Bay Area Governments (ABAG) and Metropolitan Transportation Commission (MTC), 2013. Plan Bay Area 2013: Strategy for a Sustainable Region, July 2013

16 PDAs in Richmond include the Central Richmond and 23rd Street Corridors, South Richmond, and North Richmond. For maps and more information, see the Plan Bay Area web site: http://gis.abag.ca.gov/website/PDAShowcase/
City of Richmond
Climate Action Plan
CHAPTER 3
EMISSIONS INVENTORIES, FORECASTS, AND REDUCTION TARGET

The City of Richmond greenhouse gas (GHG) emissions inventory quantifies the annual GHG emissions resulting from activities within the City by residents, businesses, and local government. The community inventory provides an understanding of where GHG emissions are originating and informs development of effective strategies and actions to reduce emissions.

The City's baseline Community GHG Inventory for 2005 forms the basis for setting emissions reduction targets and measuring future progress. In developing the CAP, the City revised its existing 2005 inventory with better transportation and solid waste data, and compiled a 2012 inventory update that allows the City to start assessing emissions trends over time. Detailed information regarding the boundaries of analysis, methods of quantification, data sources, and changes that occurred between the 2005 and 2012 inventories is provided in Appendix B.

The 2005 baseline and 2012 updated inventories account for GHG emissions in metric tons of carbon dioxide equivalent (MTCO2e)\(^1\) from four sectors: energy, transportation, solid waste, and water. The GHG inventories are presented as:

1. Community GHG Inventory: Includes all emission sources within the community with the exception of large industrial sources that are regulated by CARB and are a part of California’s Cap and Trade Program per the requirements of Assembly Bill 32 (AB 32). These sources are referred to in this chapter as “AB 32-regulated facilities.”

2. Community GHG Inventory with AB 32-Regulated Sources: Includes emissions from all sources located within the City of Richmond including large industrial facilities regulated by the State.\(^2\)

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\(^1\) MTCO2e combines the global warming potential (GWP), or extent to which each GHG is able to trap heat, for carbon dioxide (CO2), methane (CH4) and/or nitrous oxide (N2O) into a single unit of measurement for purposes of comparison.

\(^2\) These sources were not regulated per the requirements of AB 32 in 2005, as AB 32 was not signed until 2006.
Emissions Inventories, Forecast, and Reduction Targets

This approach is consistent with guidance from the BAAQMD, which recommends presenting community GHG inventories with and without large industrial sources that are regulated by the State through CARB. The adjusted inventory approach 1) provides City directives and actions that advance sustainability for community emission sources; and 2) institutionalizes and formalizes City support of State cap-and-trade regulation of large industrial facilities.

3.1 Community Inventory

As shown in Table 3.1, the baseline (2005) Community GHG Inventory for the City of Richmond includes 693,426 MTCO2e. In 2012, community emissions rose by 0.4% to 696,407 MTCO2e.

If large industrial sources currently regulated by AB 32 are added to the Community Inventory, total 2005 emissions from sources within the City of Richmond amount to more than 5.6 million MTCO2e.

<table>
<thead>
<tr>
<th>Sector</th>
<th>2005 MTCO2e (baseline)</th>
<th>2012 MTCO2e</th>
<th>Change from 2005 to 2012 MTCO2e</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential Energy Use</td>
<td>126,118</td>
<td>120,248</td>
<td>-5,870</td>
<td>-4.7</td>
</tr>
<tr>
<td>Commercial/Industrial/Municipal Energy Use</td>
<td>226,591</td>
<td>225,736</td>
<td>-855</td>
<td>-0.4</td>
</tr>
<tr>
<td>Transportation (On- and Off-road)</td>
<td>287,916</td>
<td>299,701</td>
<td>11,785</td>
<td>4.1</td>
</tr>
<tr>
<td>Solid Waste</td>
<td>50,214</td>
<td>48,999</td>
<td>-1,215</td>
<td>-2.4</td>
</tr>
<tr>
<td>Wastewater</td>
<td>222</td>
<td>239</td>
<td>17</td>
<td>7.6</td>
</tr>
<tr>
<td>Water</td>
<td>2,364</td>
<td>1,484</td>
<td>-880</td>
<td>-37.2</td>
</tr>
<tr>
<td>Community GHG Inventory</td>
<td>693,426</td>
<td>696,407</td>
<td>2,982</td>
<td>0.4</td>
</tr>
<tr>
<td>Large Industrial Energy Use (Regulated by AB 32)</td>
<td>4,914,982</td>
<td>4,169,879</td>
<td>-745,103</td>
<td>-15.2</td>
</tr>
<tr>
<td>Community GHG Inventory with AB 32-Regulated Sources</td>
<td>5,608,407</td>
<td>4,866,206</td>
<td>-742,121</td>
<td>-13.2</td>
</tr>
</tbody>
</table>

Figure 3-1 illustrates the results of the 2005 community inventory, with and without emissions from AB 32-regulated sources. Without the emissions from AB-32 regulated sources, the Richmond Community GHG Inventory resembles that of most other cities in California. Contributing the largest share of emissions to adjusted Community GHG Inventory is On-road Transportation, accounting for approximately 38 percent of total emissions. Commercial/Industrial/Municipal Energy Use (from electricity and natural gas) accounts for around 33 percent of total emissions, while 18 percent is attributed to Residential Energy Use. The remaining emissions are comprised of GHGs from Solid Waste (7 percent), Off-road Transportation (3 percent), Water and Wastewater (1 percent).

In 2012 the City emitted approximately 4.9 million MTCO2e, of which almost 4.2 MTCO2e (82 percent) is attributed to large industrial emissions regulated by AB 32 (see Table 3.1). The 2012 inventory is similar to the 2005 inventory in terms of total emissions and relative contribution by sector. The vast majority of emissions were the result of large industrial sources that are regulated by AB 32, and when those sources are excluded, the biggest contributions are from On-road Transportation (54 percent), followed by Commercial/Industrial/Municipal Energy Use (25 percent), and Residential Energy Use (13 percent).

2 These sources were not regulated per the requirements of AB 32 in 2005, as AB 32 was not signed until 2006.
How does the Richmond Cap Consider “AB 32 Regulated” Sources?

The Richmond CAP is largely focused on GHG emissions sources that the City controls or influences. Consistent with the Contra Costa County CAP, guidance from the BAAQMD, and ICLEI’s Draft Community-wide Protocol, the City has elected to utilize and support AB 32 as the primary vehicle to regulate and reduce emissions from large industrial facilities (Chevron, West Contra Costa County Landfill, and New NGC, Inc.) in its community-wide GHG reduction target for the following reasons:

1. These facilities’ GHG emissions are regulated by CARB under the state’s Cap and Trade program, which requires that power generators, refineries, and other large industrial emitters that emit more than 25,000 metric tons of carbon dioxide equivalent per year (which collectively represent approximately 85 percent of the state’s emissions) reduce their emissions over time in line with the California Global Warming Solutions Act of 2006 (AB 32). The Cap and Trade program provides a limit on emissions with the state as the enforcing agency; the City does not have the same jurisdictional authority.

2. These facilities are also regulated through the Federal Energy Regulatory Commission (FERC) and the California Energy Commission (CEC), and are subject to air quality and emissions standards set forth by the Environmental Protection Agency, CARB, and the BAAQMD.

3. Chevron’s GHG emissions are currently limited by the Conditional Use Permit the City recently issued for the Chevron Refinery Modernization Project. Mitigation included in the project’s Environmental Impact Report (EIR) ensures compliance with AB 32 by requiring the refinery, even operating at full capacity (100% utilization), to maintain no net increase (NNI) in GHG emissions, and include numerous measures to reduce GHG emissions from operations. In addition, the subsequent Environmental and Community Investment Agreement (ECIA) between Chevron and the City identifies a number of Community-based GHG Reduction Programs (CGRPs) designed to mitigate the refinery’s operational GHG emissions that fall outside of California’s Cap and Trade Program, and allocates funding to those programs and to community programs that overlap those in the CAP, covering the transportation and mobility, energy, solid waste, and biological sequestration sectors.
Comparison of the 2005 and 2012 inventories shows that the City saw a reduction in total GHG emissions, including Large Industrial Energy Use by sources regulated under AB 32, of 742,121 MTCO2e over the seven year period (a 13.2 percent reduction). Excluding sources regulated by AB 32, emissions increased by 0.4 percent (2,982 MTCO2e). As shown in Table 3.1, every sector saw a reduction in emissions with the exception of Transportation and Wastewater, which exhibited increases of 4.1 and 7.6 percent, respectively. The sectors that exhibited the greatest decrease in emissions were Water (37.2 percent) and Large Industrial Energy Use (15.2 percent).

### Municipal Inventory

The GHG emissions associated with municipal facilities and operations, referred to as the Municipal Inventory, are a subset of the community-wide inventory. The Municipal Inventory represents less than one percent of the Community Inventory. Despite this low percentage, the City of Richmond recognizes the importance of providing leadership to the community and is committed to introducing policies and programs to reduce GHG emissions associated with its operations. Table 3.2 shows the municipal emissions for 2005 and 2012, which are estimated to be around 7,845 MTCO2e and 8,175 MTCO2e, respectively. In 2005 municipal energy use for Buildings accounted for the greatest share of emissions at approximately 46 percent, followed by the City’s Vehicle Fleet at 18 percent and Streetlights at 17 percent. In 2012, the City’s Vehicle Fleet had surpassed energy use as the greatest source of municipal emissions at around 35 percent, followed by Buildings at approximately 33 percent, and Water and Sewerage at 13 percent.
Table 3-2: Municipal Inventory Results

<table>
<thead>
<tr>
<th></th>
<th>2005 MTCO2e</th>
<th>2012 MTCO2e</th>
<th>Percent Change 2005-2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buildings</td>
<td>3,599</td>
<td>2,669</td>
<td>-26%</td>
</tr>
<tr>
<td>Streetlights</td>
<td>1,312</td>
<td>930</td>
<td>-29%</td>
</tr>
<tr>
<td>Water and Sewerage</td>
<td>1,005</td>
<td>1,033</td>
<td>3%</td>
</tr>
<tr>
<td>Waste</td>
<td>543</td>
<td>701</td>
<td>29%</td>
</tr>
<tr>
<td>Vehicle Fleet</td>
<td>1,386*</td>
<td>2,842</td>
<td>105%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>7,845</strong></td>
<td><strong>8,175</strong></td>
<td>4%</td>
</tr>
</tbody>
</table>

*2005 data unavailable, 2008 used as proxy year

3.3 Emissions Forecasts and Reduction Targets

Business as Usual Forecast

Business-as-usual (BAU) emissions forecasts for 2020 and 2030 were derived based on demographic growth projections from the City of Richmond General Plan 2030 for future population, jobs, and households. Emissions forecasts for 2040 and 2050 were derived by continuing the average annual growth rates from 2005 to 2030. Excluding sources regulated by AB 32, the City of Richmond’s community emissions are expected to increase approximately 11 percent between 2005 (the baseline year) and 2020, from 693,426 to 767,673 MTCO2e; by 2030 emissions would increase approximately 46 percent from baseline conditions to approximately 1,015,000 MTCO2e; by 2050 emissions would increase to nearly 1.3 million MT CO2e. The BAU emissions forecasts are depicted in Figure 3.3. (For additional information on how these forecasts were derived see Appendix B.)

Adjusted Business as Usual Forecast

The adjusted business as usual (Adjusted BAU) forecast accounts for the local impact of state measures designed to reduce GHG emissions. Through its Climate Change Scoping Plan Update of 2014, the State of California establishes a broad framework to reduce GHG emissions to 80 percent below 1990 levels by 2050, across all sectors of the economy. Transportation measures in particular are designed to achieve consistent GHG emissions reductions across the state by increasing vehicle efficiency and reducing the carbon intensity of fuels used by the statewide vehicle fleet. These measures include the Pavley II/CAFÉ (Corporate Average Fuel Economy) Vehicle standards (known as the Advanced Clean Car initiative in California), the Low Carbon Fuel Standard (LCFS), the Tire Pressure Program, the Tire Tread Standard, and the Heavy Duty Vehicle Emission Reduction Program. Collectively, these measures are expected to reduce statewide transportation emissions by nearly 35 percent from the 2030 BAU forecast, and by extension should reduce community-wide emissions in the City of Richmond by the same percentage.

The Adjusted Business-As-Usual forecast for the City accounts for these state-level transportation measures. Figure 3-3 shows how the BAU forecast compares to the Adjusted BAU forecast that accounts for state measures.

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3 The BAU forecast takes into consideration emissions reductions resulting from implementation of statewide mandates including the California’s Advanced Clean Car Initiative (Pavley II standards) to reduce GHG emissions from passenger vehicles and the Low Carbon Fuel Standard to reduce the carbon intensity of vehicle fuels. For additional information on how future emissions were calculated, see Appendix B.

4 Note that state measures affecting energy efficiency (e.g., SB 350) and renewable energy (Renewables Portfolio Standard) are not accounted for here.
Governor Schwarzenegger’s Executive Order S-3-05 established a statewide GHG emissions goal of 80 percent below 1990 levels by 2050. In its Climate Change Scoping Plan of September 2008, and confirmed in the Scoping Plan Update in 2014, CARB recommends that local governments adopt a GHG reduction target consistent with the State’s commitment to reach 1990 levels by 2020. This was identified as equivalent to 15% below “current” levels at the time of writing (2008). In its GHG Plan Level Guidance, BAAQMD also recommends using a baseline year of 2008 or earlier.

Under California’s constitutional system, the Legislature, not the Governor, is entrusted to make statewide laws. (See Santa Ana Hospital Medical Center v. Belshe (1997) 56 Cal.App.4th 819, 836; see also Cal. Const. Art. 4 § 8(b)). The Legislature did not include EO S-3-05 goals in AB 32, and has not incorporated the EO in any implementing legislation or applicable plans.

Governor Brown’s Executive Order B-3-15 established the statewide interim GHG emission reduction target at 40% below 1990 levels.

The City’s 2020 GHG emissions target, equivalent to 15 percent below 2005 levels, is 589,412 metric tons CO2e. Figure 3-4 illustrates the 2020 target in relation to deeper reductions needed for the City to maintain an emissions trajectory in line with the longer term statewide goals established by Executive Orders S-3-05 and B-3-15.

As outlined in the next chapter, Objectives and Strategies, the CAP provides a clear roadmap to meeting the 2020 target mandated by AB 32, and includes measures that will enable the City to accomplish much deeper reductions by 2030 and beyond, consistent with City commitments to support the state’s progress toward deeper emissions reductions as called for in Executive Orders S-3-05 and B-3-15. As the State enacts new policies and regulations for reducing GHG emissions, the CAP and the City’s own GHG reduction targets will be revised accordingly.

**Figure 3-4: Richmond GHG Emissions Baseline, Forecasts, and 2020 Target**

- **Business as Usual (BAU) Emissions**
- **Adjusted forecast BAU emissions, with State transportation measures**
- **Emissions trajectory based on state targets**
OBJECTIVES AND STRATEGIES

Climate Action Plan objectives and strategies were co-developed by the City with input from members of the public during community workshops and meetings, and through consultations with key local community groups and agencies. The eight objectives support the four CAP goals, and the goals, policies, and actions of the City’s General Plan 2030 and other adopted City plans and ordinances.

Climate Action Plan Goals

| GHG Emissions Reduction |
| Healthy and Resilient Community |
| Prosperous Local Economy |
| Engaged Community and Educated Youth |

4.1 Organization of Objectives and Strategies

These four goals are supported by eight CAP objectives, which are derived from one or more Richmond General Plan 2030 policies.

2. Increase Use and Generation of Renewable Energy
3. Sustainable Transportation and Land Use
4. Zero Waste
5. Water Conservation
6. Green Infrastructure and Local Agriculture
7. Green Business and Industry
8. Resiliency to Climate Change

Leadership in Managing Climate Change

All eight CAP objectives are supported by the City’s two policies pertaining to leadership in managing climate change:

- Policy EC1.1 Leadership and Advocacy. Take a leadership role in advocating for local, regional and national solutions to climate change at all levels of government and with the private sector.
- Policy EC1.2 Public Awareness and Support. Provide incentives to encourage residents and businesses to reduce their carbon footprint by raising their awareness about the impacts of climate change and by building support for climate change initiatives in Richmond and the greater region.
The eight objectives provide an organizing framework for the forty CAP strategies presented in the following pages. Table 4.1 summarizes the estimated GHG reductions from each strategy, showing relative contributions toward meeting Richmond’s 2020 GHG reduction target and maintaining reductions consistent with the State’s longer term target for 2030. Methods of quantifying annual energy and GHG savings are documented in Appendix D. The GHG reduction estimates are based on standard methods and assumptions recommended by State and regional agencies, augmented by data obtained from local organizations and agencies, recent trends, relevant case studies, or reasonable assumptions regarding program participation. Some strategies are difficult to quantify or do not reduce emissions directly, but support other strategies or programs in the CAP. These strategies are identified as “Supporting Actions.”

Figure 4-1: Relationship of CAP Components

<table>
<thead>
<tr>
<th>Table 4-1: Summary of Strategies and GHG Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Objective 1: Increase Energy Efficiency of Buildings and Facilities</td>
</tr>
<tr>
<td>Strategy EE1</td>
</tr>
<tr>
<td>Strategy EE2</td>
</tr>
<tr>
<td>Strategy EE3</td>
</tr>
<tr>
<td>Strategy EE4</td>
</tr>
<tr>
<td>Objective 2: Increase Use and Generation of Renewable Energy</td>
</tr>
<tr>
<td>Strategy RE1</td>
</tr>
<tr>
<td>Strategy RE2</td>
</tr>
<tr>
<td>Strategy RE3</td>
</tr>
<tr>
<td>Objective 3: Sustainable Transportation and Land Use</td>
</tr>
<tr>
<td>Strategy TL1</td>
</tr>
<tr>
<td>Strategy TL2</td>
</tr>
<tr>
<td>Strategy TL3</td>
</tr>
<tr>
<td>Strategy TL4</td>
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<tr>
<td>Strategy TL5</td>
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<tr>
<td>Strategy</td>
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<td>----------</td>
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<td>Strategy TL6</td>
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<td>Strategy TL7</td>
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<tr>
<td>Strategy TL8</td>
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<tr>
<td>Strategy TL9</td>
</tr>
<tr>
<td>Objective 4: Zero Waste</td>
</tr>
<tr>
<td>Strategy SW1</td>
</tr>
<tr>
<td>Strategy SW2</td>
</tr>
<tr>
<td>Strategy SW3</td>
</tr>
<tr>
<td>Strategy SW4</td>
</tr>
<tr>
<td>Strategy SW5</td>
</tr>
<tr>
<td>Objective 5: Water Conservation</td>
</tr>
<tr>
<td>Strategy WA1</td>
</tr>
<tr>
<td>Strategy WA2</td>
</tr>
<tr>
<td>Strategy WA3</td>
</tr>
<tr>
<td>Strategy WA4</td>
</tr>
<tr>
<td>Objective 6: Green Infrastructure, Urban Forestry and Agriculture</td>
</tr>
<tr>
<td>Strategy GA1</td>
</tr>
<tr>
<td>Strategy GA2</td>
</tr>
<tr>
<td>Strategy GA3</td>
</tr>
<tr>
<td>Objective 7: Green Business and Industry</td>
</tr>
<tr>
<td>Strategy GB1</td>
</tr>
<tr>
<td>Strategy GB2</td>
</tr>
<tr>
<td>Strategy GB3</td>
</tr>
<tr>
<td>Strategy GB4</td>
</tr>
<tr>
<td>Strategy GB5</td>
</tr>
<tr>
<td>Strategy GB6</td>
</tr>
<tr>
<td>Objective 8: Resiliency to Climate Change</td>
</tr>
<tr>
<td>Strategy RC1</td>
</tr>
<tr>
<td>Strategy RC2</td>
</tr>
<tr>
<td>Strategy RC3</td>
</tr>
<tr>
<td>Strategy RC4</td>
</tr>
</tbody>
</table>
In addition to GHG reductions, each strategy was evaluated using a broad set of criteria, including public health benefits and other co-benefits, including local economic benefits, availability of funding, financial impact to the City, and the ability to track and measure effectiveness. Key evaluation criteria are presented for each strategy in the following pages. The figure below explains the icons used to represent public health and other community co-benefits.

In-depth strategy evaluations, including discussion of relevant existing programs and planned implementing actions, are provided in Appendix E (CAP Implementing Actions). Implementing actions generally include changes in municipal codes, ordinances, and policies, new City programs and initiatives, and establishing or strengthening partnerships with outside organizations. The evaluations in Appendix E consider several criteria for each strategy, including costs, GHG reduction potential, funding sources, implementation responsibility, co-benefits, and potential implementation partners.

### Objective 1: Energy Efficient Buildings and Facilities

Support energy conservation by businesses, residents, City government, and schools. Promote efficient use of energy in the design, construction, and operation of public and private facilities, infrastructure, and equipment.

Emissions associated with consumption of electricity and natural gas account for approximately 38 percent of the City’s 2012 Community GHG emissions with 25 percent associated with commercial buildings and industrial use, and 13 percent associated with residential buildings. Significant opportunities exist to leverage existing programs to reduce energy demand, and maximize energy efficiency, as well as develop new programs and strategies. Richmond’s strategies and implementing actions are consistent with California’s clean energy policy, which prioritizes energy efficiency in the state’s quest to meet energy demand.\(^1\)

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\(^1\) As determined by the energy resource loading order adopted in the state’s 2003 Energy Action Plan, and established by California’s principal energy agencies: the California Energy Commission, the California Public Utilities Commission, and the California Consumer Power and Conservation Financing Authority.
Senate Bill 350 (SB 350) requires California to 1) generate half of its electricity from renewable energy sources; 2) double energy efficiency for both electricity and natural gas end uses in all buildings by 2030; and 3) substantially improve the infrastructure for electric vehicle transportation. Richmond is already on track to exceed SB 350’s renewables portfolio requirement, through its participation in Marin Clean Energy’s (MCE’s) green electricity programs. The City can also expect to make rapid progress toward SB 350’s energy efficiency goal for existing buildings, with a wealth of funding sources, incentives, and financing tools currently available for local improvement projects, and a reasonable expectation that additional State programs and funding sources will continue to develop.

Commercial and industrial building stock represents an important opportunity for energy efficiency and conservation programs, as 4.7 percent of City land use is for commercial activities, and 21.7 percent is for industrial and port activities. Richmond has approximately 2.6 million square feet of office space, and the City estimates that substantially more will be required in the near future. By 2035, current job projections suggest demand for as much as 1.0 million to 1.3 million square feet of office space; even if current vacancies absorb some of this demand, these estimates still represent a significant addition of new space. The City houses approximately 11.3 million square feet of warehouse and manufacturing space, which is also projected to grow by 2035.

Single family homes make up more than half (57 percent) of the local housing stock in Richmond. Housing units are equally split between the number of renters and homeowners, with 52 percent of homes owner-occupied and 48 percent of homes renter-occupied. Seventy percent of the City’s homes were built before 1980. Older homes are typically less efficient, resulting in both higher energy bills and higher GHG emissions. These are all homes built prior to when California building energy efficiency standards went into effect, which ensure new and existing buildings maximize energy efficiency and preserve outdoor and indoor environmental quality. Even making small changes in homes can provide significant contributions in reducing GHG emissions and will save money. Actions such as switching to LED light bulbs, replacing old and inefficient appliances, and repairing leaky faucets and drafty doors and windows are some of the most effective ways to save energy. Such measures reduce energy costs, increase home values, and improve indoor air quality for residents.

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2 City Facts, City of Richmond. September 3, 2015.
4 City Facts, City of Richmond. September 3, 2015.
5 American Community Survey. (2013). Table DP04. Selected housing characteristics.
Objectives and Strategies

PACE Programs

Property Assessed Clean Energy (PACE) programs provide financing for energy and water efficiency improvements and renewable energy systems. The repayment of the loan is collected on the property owner’s tax bills over the course of several years, and the loan remains with the property if it is sold. Since the loan is tied to the property, it provides less risk to property owners to undertake energy efficiency measures with a longer term payback. There are currently three PACE programs available to businesses and residents in Richmond: HERO Financing, California First Efficiency Financing, and Figtree Financing. The City has adopted an open marketplace policy and will add additional PACE programs as they become available.

Assistance for low-income households

The Low Income Home Energy Assistance Program (LiHEAP), administered by Contra Costa County Community Services Bureau, provides income qualified homes with building envelope improvements, appliance upgrades, and other cost-effective improvements that improve energy efficiency. Lower income households can spend four times more of their income on energy costs than higher income households. Weatherization services can reduce this cost burden by lowering their energy consumption by up to 35 percent, saving an average of $400 on a household’s heating and cooling bills in the first year alone.

Promoting energy efficient building and facilities will provide many health and equity co-benefits to residents, business owners, students, faculty, and staff in Richmond. Enhanced indoor air quality and healthier homes can be achieved by improving ventilation and duct systems, sealing drafty leaks to crawl spaces and attics, and testing of carbon monoxide sources caused by appliances. These improvements can also control moisture, reducing mold and other indoor allergens that contribute to and exacerbate asthma, while lessening noise pollution by sealing the building. Efficient buildings tend to have more natural light, which is associated with improved productivity. All of these outcomes can lead to enhanced personal, fewer sick days, and higher performing students and employees.

Compared with the greater Bay Area, many Richmond residents have less disposable income, making them more vulnerable to rising energy costs. Richmond has a high percentage of households that are low income, renter occupied, and housing cost burdened. Nearly half (48 percent) of all renters in Richmond are housing cost burdened. These are families that pay more than 30 percent of their income on housing, meaning they have limited disposable income, making it difficult to make energy retrofit and climate ready upgrades. Lower-income residents also tend to live in older, less efficient buildings. These homes are less likely to have energy-efficient features and appliances, and it is more challenging for these households to invest in longer-term cost saving energy efficiency upgrades. These same residents are also the most vulnerable to housing and cost of living increases across the Bay Area. Targeting energy upgrades to low-income residents living in older homes is one of the most cost-effective strategies to improve energy efficiency while providing multiple co-benefits to the community. Energy efficiency upgrades reduce utility bills and increase financial stability thereby freeing up funds for essential needs such as healthy food and health care.

6 American Community Survey. (2013). Table B25106. Tenure by Housing Costs.
Several energy efficiency programs are available to Richmond’s low-income populations and communities of color, including the County’s Low Income Home Energy Assistance Program (LiHEAP) (see inset) and the Richmond Distressed Housing Rehabilitation Program, administered by the Richmond Community Foundation, which leverages social impact bonds to restore blighted homes (including energy and water upgrades) and sell to first time home buyers, including those participating in the SparkPoint Contra Costa program. Rising Sun Energy Center’s California Youth Energy Services (CYES) Program hires youths ages 15 to 22 during the summer to provide green house calls for residents to identify and install energy and water efficiency home improvements, at no cost to the resident. The program focuses on non-English speaking households, renters, moderate income households, and seniors.

General 2030 Plan Alignment

CAP Objective 1 supports the following General Plan 2030 policies:

- **Policy EC3.2 Energy Efficiency and Conservation.** Promote efficient use of energy and conservation of available resources in the design, construction, maintenance and operation of public and private facilities, infrastructure and equipment.

- **Policy EC3.5 City Government Operation.** Promote climate-friendly standards, practices, technologies and products in all City facilities and operations.

- **Policy EC4.3 Green Buildings and Landscaping.** Require energy and resource efficient buildings and landscaping in all public and private development projects.

- **Policy HW10.1 Citywide Energy Footprint.** Work towards reducing the overall energy footprint from residential, industrial, transportation and City operations.
## Strategies to Increase Energy Efficiency of Buildings and Facilities

<table>
<thead>
<tr>
<th>GHG Reduction:</th>
<th>Health Co-benefits:</th>
<th>Other Co-Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>261,728 MT CO2e by 2030</td>
<td>Improved indoor air quality &amp; comfort, reduced mold, reduced noise pollution, improved lighting</td>
<td>![Icon] ![Icon] ![Icon] ![Icon] ![Icon]</td>
</tr>
</tbody>
</table>

### Strategy EE1: Leverage Existing Programs and Rebates to Improve Efficiency of Existing Buildings.

<table>
<thead>
<tr>
<th>Performance Goal</th>
<th>Timeframe</th>
<th>Tracking Metrics</th>
<th>GHGs Reduced - 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve the energy efficiency of all existing buildings (residential, commercial, and industrial) by 50 percent by 2030.</td>
<td>Ongoing</td>
<td>Electricity and natural gas use (total and per capita). Number of buildings retrofitted.</td>
<td>145,860 MT CO2e</td>
</tr>
</tbody>
</table>

### Strategy EE2: Leverage Existing Funding Programs and Financing Tools.

<table>
<thead>
<tr>
<th>Performance Goal</th>
<th>Timeframe</th>
<th>Tracking Metrics</th>
<th>GHGs Reduced - 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase energy program participation rates.</td>
<td>Ongoing</td>
<td>Electricity and natural gas use (total and per capita). Number of buildings retrofitted.</td>
<td>Supports EE1</td>
</tr>
</tbody>
</table>

### Strategy EE3: Promote Green Building.

<table>
<thead>
<tr>
<th>Performance Goal</th>
<th>Timeframe</th>
<th>Tracking Metrics</th>
<th>GHGs Reduced - 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>All new buildings meet or exceed Title 24 standards at time of construction; by 2020 all new residential buildings will be ZNE; by 2030 all new commercial buildings will be ZNE.</td>
<td>Ongoing</td>
<td>Square footage of new construction meeting/exceeding Title 24 Square footage of new construction achieving ZNE</td>
<td>115,867 MT CO2e</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Performance Goal</th>
<th>Timeframe</th>
<th>Tracking Metrics</th>
<th>GHGs Reduced - 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support Strategies EE1 through EE3.</td>
<td>Ongoing</td>
<td>City energy outreach budget Program participation rates</td>
<td>Supports EE1</td>
</tr>
</tbody>
</table>
Objective 2: Increase Use and Generation of Renewable Energy

Promote the generation, transmission, and use of a range of renewable energy sources, such as solar, wind power and waste energy to meet current and future demand. Encourage new development and redevelopment projects to generate a portion of their energy needs through renewable sources.

The City is committed to promoting renewable and alternative energy generation in its own operations and throughout the community. Renewable energy sources include solar, wind and alternative fuels that aim to replace energy generated by conventional fossil fuels. Renewable energy systems should be combined with cost-effective efficiency and conservation measures to maximize cost savings and community co-benefits.

Through a series of legislation that began in 2002, California has placed requirements on electric utilities to procure a portion of their energy from renewable sources. The standard, known as the Renewables Portfolio Standard (RPS), applies to investor-owned utilities, publicly-owned utilities, electricity service providers, and community choice electricity aggregators. To comply with the legislation, utilities in California must procure a minimum of 25 percent of its retail electricity sales from qualifying renewable sources by 2016, 33 percent by 2020, and 40 percent by 2035. As of 2015, Pacific Gas and Electric (PG&E) sourced 27 percent of its retail sales from renewable sources, surpassing the standard for 2016.

In 2016 Richmond will be home to MCE’s Solar One, a 10.5 MW ground mount solar farm. One of the largest solar projects in the Bay Area, Solar One is being constructed on a 49-acre parcel at a former Chevron Richmond Refinery brownfield site. MCE has teamed with RichmondBUILD to train and hire employees for the Solar One Project. The project will create 344 local jobs and will generate enough power for nearly 3,000 homes per year.

The City of Richmond is already well beyond compliance with the RPS. In 2013 the City joined Marin Clean Energy (MCE) to increase renewable energy choices for local businesses and residents. A “Community Choice Aggregation” program, MCE procures electricity from renewable sources – solar, wind, bioenergy, geothermal, and small hydro – and then partners with PG&E to deliver electricity to homes and businesses. As of 2015, over 80 percent of Richmond’s electrical customers have enrolled in MCE; of these, 99 percent are enrolled in the Light Green Option that sources 56 percent of its energy supply from renewable energy sources, and less than 1 percent were enrolled in the Deep Green option, which provides a 100 percent renewable energy option. The City will help residents and ratepayers understand their choice and promote enrollment in the MCE Light Green, Deep Green, and Local Sol (100 percent locally generated solar energy) programs. The City will continue to work with both PG&E and MCE to increase the percent of electricity that is sourced from renewable systems. Specifically, the City will support MCE in achieving their goal of providing 100 percent of its electricity from renewable sources by 2025.
Richmond’s industrial base and its large concentration of warehouses provide significant potential for increasing solar production throughout the City. And if the West Contra Costa Unified School District (WCCUSD) installed solar on the roofs of all of its schools and administration buildings in Richmond, they would produce the equivalent of enough electricity to power more than 2,700 homes, saving more than 1,300 MT CO2e annually.⁸

MCE offers businesses in Richmond the opportunity to choose 50 to 100 percent renewable energy at highly competitive rates. Businesses that voluntarily “opt-UP” to MCE’s Deep Green 100% renewable energy service—and effectively eliminate the carbon pollution associated with their electricity usage—are entitled to complimentary marketing benefits by joining MCE’s Deep Green Champions (http://mcecleanenergy.org/deep-green-champions/). These include free publicity on MCE’s webpage and social media platforms; printed advertisements and outreach material; and a variety of co-branding opportunities. The Catahoula Coffee Company, for example, has appeared in MCE’s public service announcements, and features a customized “100% Renewable” logo on all of its coffee bags. By partnering together, MCE and Richmond’s business community are providing dynamic examples of how the twin goals of earning a profit and protecting the planet can be mutually reinforcing.

Generating large quantities of energy within Richmond reduces dependency on fossil fuels and benefits the community by creating local green jobs, improving health, and increasing community resilience. Generating electricity from renewable sources also reduces harmful air pollutants and benefits public health, especially for people living and working near power plants. Replacing fossil fuels with renewable energy improves air quality and can result in direct health benefits such as decreased respiratory ailments, lost workdays, and overall healthcare costs, and indirect health benefits such as local, green jobs creation that supports Richmond residents.

Renewable energy can also make Richmond more resilient to power outages. Distributed energy systems spread throughout the community are more able to withstand equipment system failure during earthquakes, extreme heat events, localized flooding, or other natural disasters.

Investments in renewable energy will ensure that a broad range of Richmond residents have access to the improvements. The equity benefits and impacts of these programs can be addressed through measures such as specific programs that target low-income qualified populations (e.g. the Single-family Affordable Solar Homes [SASH] program), workforce development for green jobs (e.g., RichmondBUILD), and partnerships with local community-based organizations.

Natural gas is used extensively throughout Richmond for residential, commercial, and industrial energy applications, accounting for 31 percent of the baseline Community GHG Inventory. A good portion of natural gas emissions can be reduced by efficiency improvements outlined in the energy efficiency strategies in the previous section; however, the City recognizes that to meet its GHG reduction goals, it must promote conversion of natural gas systems to solar thermal systems or electric systems that are powered with renewable electricity.

General Plan 2030 Alignment

CAP Objective 2 supports the following General Plan 2030 policies:

- **Policy EC3.1 Renewable Energy.** Promote the generation, transmission and use of a range of renewable energy sources such as solar, wind power and waste energy to meet current and future demand and encourage new development and redevelopment projects to generate a portion of their energy needs through renewable sources.

- **Policy HW10.1 Citywide Energy Footprint.** Work towards reducing the overall energy footprint from residential, industrial, transportation and City operations.
## Objectives and Strategies

### Strategies to Increase Use and Generation of Renewable Energy

<table>
<thead>
<tr>
<th>GHG Reduction:</th>
<th>Health Co-benefits:</th>
<th>Other Co-Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>113,520 MT CO2e by 2030</td>
<td>Improved air quality, reduced premature mortality</td>
<td></td>
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</table>

### Strategy RE1: Increase Local Solar Energy Generation

The City will promote the installation of distributed, small-scale solar photovoltaic systems (solar PV), as well as other renewable energy generation systems, in existing buildings and new construction. Richmond is leading local solar development in the Bay Area through innovative policy decisions that create competition and marketplaces for local renewable energy development.

<table>
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</thead>
<tbody>
<tr>
<td>By 2030, 1,010 new residential solar installations averaging 4 kW per system; 69 new commercial solar installations averaging 174 kW per system.</td>
<td>Ongoing</td>
<td>Number of homes and businesses solarized</td>
<td>8,422 MT CO2e</td>
</tr>
<tr>
<td><strong>Total local solar generation capacity; quantity installed per year</strong></td>
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</table>

### Strategy RE2: Promote and Maximize Utility Clean Energy Offerings

The City will promote renewable and alternative energy generation in its own operations and throughout the community.

<table>
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<tbody>
<tr>
<td>In partnership with MCE supply at least 87 percent of community electricity from sources that are 95 percent renewable, by 2025; PG&amp;E will supply the remainder of community electricity from sources that are at least 50 percent renewable by 2030.</td>
<td>Ongoing</td>
<td>Enrollment in MCE Green Energy programs</td>
<td>57,390 MT CO2e</td>
</tr>
<tr>
<td>Average CO2e content of PG&amp;E and MCE electricity</td>
<td></td>
<td></td>
<td></td>
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</table>

### Strategy RE3: Promote Conversion From Natural Gas to Clean Electricity

The City will promote conversion of residential and commercial natural gas systems to electric systems powered by renewable energy or solar thermal systems.

<table>
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</thead>
<tbody>
<tr>
<td>Residential: Convert 1,328 water heaters annually from natural gas to electric in Richmond homes by 2030.</td>
<td>Ongoing</td>
<td>Number of natural gas systems electrified</td>
<td>42,486 MT CO2e</td>
</tr>
<tr>
<td>Commercial: 6 percent of currently forecasted natural gas use is electrified by 2020, and 17 percent by 2030.</td>
<td></td>
<td>Therms reduced by electrification per year</td>
<td></td>
</tr>
</tbody>
</table>
Objective 3: Sustainable Transportation and Land Use

Encourage the use of low-emission and renewable fuel vehicles by residents and businesses, schools, public agencies, and City government. Support and promote enhanced and expanded public transit; walkability and bicycling; mixed-use urban streets; and creation of an urban landscape that reduces reliance on private automobiles. Promote the safe and efficient movement of goods by truck, rail and ship to support port operations and industrial uses.

The transportation sector accounts for the largest source of emissions in the City. In 2012, GHG emissions associated with transportation and land use patterns represented approximately 43 percent of the Community Inventory. The majority of transportation emissions were generated by vehicles travelling on state highways and City streets. The remainder was generated by vehicles engaged in off-road activities, like construction, agricultural production, and recreation.

Land use patterns and transportation are fundamentally related and together can determine community reliance on automobiles or proclivity to use public transportation. Existing development patterns and the inclusion of transportation infrastructure are critical factors in supporting sustainable transportation options. The strategies and actions in the Richmond CAP help the City shift from an auto-dependent culture that relies on personal motor vehicle trips to one that relies more on walking, biking, and public transit, and build on the City’s existing transportation policies, such as those in the Richmond General Plan, Bicycle Master Plan, and Pedestrian Master Plan. The resulting reductions in vehicle miles traveled (VMT), in conjunction with state and regional policies and programs mandating more fuel efficient vehicles and lower carbon fuels, are expected to result in significant GHG savings, decreased smog and toxic air pollutants, and reduced automobile engine oil runoff into local ecosystems.

The Richmond Bay Specific Plan (RBSP) proposes to develop a sustainable shoreline district designed to capitalize on the planned Berkeley Global Campus at Richmond Bay. RBSP proposes a high density, mixed-use district that includes an extensive transit, bicycle, pedestrian, and open space connectivity network, reduced parking standards for vehicles, and requirements for bicycle and pedestrian amenities to reduce vehicle trips and encourage active transportation.

The City will use smart growth strategies, which accompany a range of development and conservation strategies that support economic growth, environmental health, and GHG reductions. Smart growth is primarily a land use strategy, which places higher density, mixed-use developments near or within existing development, and near transit services. Infill development, or the redevelopment of underutilized sites within existing developed areas, is a key smart growth approach that increases the land use intensity and resulting social and economic activity within the existing urban footprint. Smart growth encourages mixed-use neighborhoods that offer a variety of housing types within close proximity to various commercial and retail services, as well as schools and parks. Smart growth strategies thereby direct new growth towards existing urban areas, and help concentrate City investments to reach more residents and preserve existing open space and critical habitat areas for enjoyment by future residents of Richmond.
The City has already begun weaving smart growth strategies into planning strategies. The City developed the Richmond Livable Corridors Form-Based Code (FBC) as a means of guiding the revitalization of three major commercial corridors in the City. The FBC describes development standards for various zones within each corridor, and incorporates principles of smart growth into the plan for these areas. The City may supplant existing zoning regulations in other areas in the City with similar form-based codes in the future as a means of continuing to implement and expand smart growth development. Areas that have already been identified as candidates for smart growth prioritization include downtown Richmond, the City’s existing and future mixed-use corridors, areas surrounding key traffic intersections, future designated pedestrian priority districts, and multi-use trails that connect high-density areas of the City to parks and open space.

Expanding public transit options and improving multi-modal network connectivity is a key component of achieving the Sustainable Transportation objective. Residents and employees in the City of Richmond have multiple transit options that provide connections throughout the Bay Area and greater Northern California region. The Amtrak Capitol Corridor line originates in Sacramento and runs south through Richmond, ending in San Jose and providing connections to most cities in between. The Richmond-Fremont Bay Area Rapid Transit (BART) line originates near Downtown Richmond and extends through San Francisco to Millbrae, northeast to the Pittsburg/Bay Point area or southeast to the Dublin/Pleasanton area, and south to Fremont. The Richmond Circular Shuttle service provides a connection between Amtrak and BART. Bus service is provided by the Alameda Contra Costa Transit District (AC Transit) and Western Contra Costa Transit Authority (WestCAT), with local and regional connecting lines. Richmond Paratransit and East Bay Paratransit are also available to residents. In addition, a new ferry line is proposed that would provide a direct connection from a new terminal at the Ford Peninsula (1.5 miles from Downtown Richmond) to San Francisco as early as 2018. Extending and increasing transit service will be essential as the City grows in the future and new employment opportunities in the City and the greater Bay Area increase the number of commuters traveling to or passing through Richmond.

Zero-emission vehicles (ZEVs) and charging stations are becoming increasingly common in the Bay Area. ZEVs include plug-in battery electric vehicles (PEVs) and hydrogen fuel cell electric vehicles (FCEVs). The availability of new vehicle

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Objectives and Strategies

models, improved battery storage, increased availability of charging infrastructure and vehicle range coupled with incentives such as carpool lane access stickers, federal tax credits, and state and air district rebates have contributed to an expanding market for PEVs. The Chevron ECIA specifies that funding is available to expand PEV infrastructure and use in Richmond. Funding from the ECIA can be used for programs and actions such that support the adoption and use of PEVs and expansion of PEV charging stations.

Transportation demand management (TDM) describes strategies to reduce demand for roadway travel, particularly in single-occupancy vehicles, or to redistribute this demand in space or in time. TDM strategies can aim to change travel behavior patterns through either voluntary incentives or requirements. The nine-county Bay Area Commuter Benefits Program, the largest TDM program in the country, is based on successful ordinances in San Francisco, Richmond, Berkeley and at San Francisco International Airport. In San Francisco alone, the local commuter benefits ordinance has helped reduce GHG emissions by as much as 286,547 metric tons annually. Richmond's Commuter Benefits Ordinance, contained in Chapter 9.62 of the City’s Municipal Code, requires all businesses with ten or more employees, who work an average of 10 or more hours per week, to offer a pre-tax election program, an employer-paid transit benefit, or employer provided transit options.

The Yellow Brick Road

In a 2008 summer youth program, a group of teen-agers from Richmond, California’s Iron Triangle neighborhood were asked to think of a project that would improve their neighborhood. They came up with a brilliantly simple idea: the Yellow Brick Road. They envisioned Iron Triangle residents identifying key community assets (e.g., schools, parks, churches, community centers, transportation hubs, etc.). Then they would connect those assets via the Yellow Brick Road — a network of “safe, green, and clean” (their words) walking and biking paths designated by brightly colored yellow bricks, stenciled on sidewalks and roads. The City of Richmond and its partners, the Local Government Commission and Pogo Park, received an Environmental Justice Transportation Planning Grant for the Yellow Brick Road from the Caltrans in 2012 to further develop this neighborhood vision into what would become the Yellow Brick Road Iron Triangle Walkable Neighborhood Plan. The plan was adopted in 2015 as an appendix to the Pedestrian Plan, and the City is currently seeking funding to implement the plan.

Health Co-Benefits of Active Travel

Active travel promotes numerous health co-benefits, such as reduced chronic disease and obesity rates and reduced traffic injuries and fatalities. Strategies to reduce GHG from transportation benefit respiratory and cardiovascular health due to changes in air pollution.

In addition to reducing GHG emissions, improving the City's transportation and land use systems has significant benefits to public health, equity and community resilience. The design of neighborhoods, streets, and homes can determine whether
children can safely play outside and walk to school, whether families can easily access basic goods and services, and whether neighbors are familiar and supportive of one another. Supporting complete neighborhoods, transit supportive development, and a variety of housing types can increase access to jobs, parks, healthy food, health and social services and encourage healthier active transportation options such as walking, biking, and utilizing public transit.

The returns on investment associated with active modes of travel are also significant. Residents who choose active transportation directly save on costs from purchasing a motor vehicle, insurance and maintenance, and may indirectly reduce healthcare costs. Lower rates of car ownership can free up parking space for wider sidewalks, “parklets,” and other beneficial uses of urban property. Having fewer cars on the road also reduces air pollution and noise, and alleviates traffic jams.10

**General 2030 Plan Alignment**

CAP Objective 3 supports the following General Plan 2030 policies:

- **Policy EC2.1 Climate-Friendly Vehicles and Equipment.** Encourage the use of available climate-friendlier vehicles and equipment to reduce energy use and carbon emissions and support the use of low-emission or renewable fuel vehicles by residents and businesses, public agencies and City government.

- **Policy EC2.2 Climate-Friendly Fuel.** Support production and distribution of climate-friendlier fuels (when and if any are identified) and identify appropriate locations for fuel storage and distribution.

- **Policy EC2.3 Expanded and Affordable Public Transit.** Coordinate with regional transportation agencies and support enhanced and expanded public transit to improve mobility options for residents and visitors.

- **Policy EC2.4 Safe and Convenient Walking and Bicycling.** Promote walking and bicycling as a safe and convenient mode of transportation.

- **Policy LU6.1 Pedestrian and Transit-Oriented Urban Environment.** Promote walkability and public transit by encouraging mixed-use, higher-density development close to community amenities.

- **Policy LU6.2 Complete Streets.** Promote mixed-use urban streets that balance public transit, walking and bicycling with other modes of travel.

- **Policy EC2.5 Regional Passenger Rail.** Support efforts by transit agencies to provide regional and long-distance passenger rail service.

- **Policy EC2.6 Private Automobile Use.** Work toward creation of an urban landscape that will reduce reliance on private automobiles through land use planning and by providing amenities and infrastructure that encourage safe and convenient use of public transit, walking and bicycling.

- **Policy EC2.7 Climate-Friendly Goods Movement.** Promote the safe and efficient movement of goods by truck, rail and ship to support port operations and industrial uses.

- **Policy EC4.2 Compact Walkable Neighborhoods and Livable Streets.** Promote safe and walkable neighborhoods and inter-connected streets through the design of streetscapes, public gathering places and all types of physical development.

- **Policy LU6.4 Long-Term Environmental Sustainability.** Promote development standards and land use patterns that encourage long-term sustainability.

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### Strategies for Sustainable Transportation and Land Use

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<thead>
<tr>
<th>GHG Reduction:</th>
<th>Health Co-benefits:</th>
<th>Other Co-Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>55,059 MT CO2e by 2030</td>
<td>Improved air quality, increased physical activity, decreased obesity, illness, and reduced premature mortality</td>
<td></td>
</tr>
</tbody>
</table>

#### Strategy TL1: Promote Smart Growth and Complete Neighborhoods

The City will promote a range of development and conservation strategies that support economic growth, environmental health, and GHG reductions, including but not limited to placing higher density, mixed-use developments near or within existing development, and near transit services.

<table>
<thead>
<tr>
<th>Performance Goal</th>
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<th>Tracking Metrics</th>
<th>GHGs Reduced - 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>By 2030, increase residential and employment density by 15% as compared to BAU.</td>
<td>Ongoing</td>
<td>Percent density increase in PDAs and citywide</td>
<td>4,768 MT CO2e</td>
</tr>
</tbody>
</table>

#### Strategy TL2: Complete Streets

The City will design its streets so that they enable safe access to goods and services for all pedestrians, bicyclists, motorists, and transit users. Complete streets in dense urban areas will encourage people to walk, bicycle, or take transit rather than drive.

<table>
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<tbody>
<tr>
<td>By 2030, make vehicle calming and speed reduction enhancements to intersections and roadways that carry 25 percent of the City's traffic.</td>
<td>Ongoing</td>
<td>Percent of total intersections and roadways retrofitted</td>
<td>668 MT CO2e</td>
</tr>
</tbody>
</table>

#### Strategy TL3: Improve Bicycle and Pedestrian Infrastructure

The City will maintain and accelerate implementation of Richmond’s Bicycle and Pedestrian Master Plans, and provide additional actions that support pedestrian and bicyclist safety and comfort, expand the bicycle and pedestrian network, and increase amenities throughout the City.

<table>
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<tbody>
<tr>
<td>Increase 50% of Master Plan implemented by 2030 with 300% increase in bicycle trips (commute and non-commute).</td>
<td>Ongoing</td>
<td>Percent of Master Plan improvements completed Percent increase in bicycle trips (commute and non-commute)</td>
<td>4,150 MT CO2e</td>
</tr>
</tbody>
</table>

#### Strategy TL4: Improve Signal Timing

The City will time groups of traffic signals along priority arterials to provide smooth movement of traffic with minimal stops.

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>Increase number of coordinated traffic signals.</td>
<td>One-time; ongoing coordination</td>
<td>Percentage of total signals coordinated</td>
<td>Supporting strategy</td>
</tr>
</tbody>
</table>
### Objectives and Strategies

#### Strategy TL5: Expand Public Transit Options and Improve Multi-Modal Network Connectivity

The City will improve the efficiency of public transit services by coordinating transit schedules and ensuring all parts of Richmond are provided access to transit options. The City may also improve amenities at existing transit stops and stations to improve rider comfort and safety.

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<tbody>
<tr>
<td>30 percent increase in transit network coverage, 30 percent reduction in headways, and conversation of 50 percent of routes to BRT by 2030; Ferry service provides 400 commute trips daily by 2030.</td>
<td>Ongoing</td>
<td>Transit ridership rates</td>
<td>9,427 MT CO2e</td>
</tr>
</tbody>
</table>

#### Strategy TL6: Expand Car Sharing, Bike Sharing and Ride Sharing

The City will expand existing and promote new car sharing, bike sharing, and ride sharing programs within Richmond and the Bay Area.

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<tbody>
<tr>
<td>75 percent of City residents and employees are within half a mile of a car share pod by 2030.</td>
<td>Ongoing</td>
<td>Percent of residents within half-mile of bike share station and/or car sharing pod, Program participation rates</td>
<td>1,433 MT CO2e</td>
</tr>
</tbody>
</table>

#### Strategy TL7: Promote Low-Carbon Vehicles and Fuels

The City will act to increase adoption of zero-emission vehicles (ZEVs) including plug-in battery electric vehicles (PEVs) and hydrogen fuel cell electric vehicles through actions including but not limited to supporting the expansion of PEV charging stations, creating a program that offers rental income for unused EVs, offering PEV car rentals, providing longer range PEV vehicles for rent to reduce range anxiety, sharing the City’s underused EVs with other residents, providing subsidies for residential developers to provide EV car share stations and subsidies for sales/leases, and developing a robust educational campaign.

<table>
<thead>
<tr>
<th>Performance Goal</th>
<th>Timeframe</th>
<th>Tracking Metrics</th>
<th>GHGs Reduced - 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>By 2030, 17% of vehicles used by residents and businesses are Plug-in electric vehicles (PEVs) or other zero emission vehicles (ZEVs).</td>
<td>Ongoing</td>
<td>ZEV vehicle penetration (percent of total fleet), Number of ZEV stations installed</td>
<td>21,549 MT CO2e</td>
</tr>
</tbody>
</table>
Strategy TL8: Outreach and Education to Support Public Transit and Active Transportation

The City will partner with local agencies, schools, and community groups to engage students, residents, and businesses in confronting the climate change challenge. Together, we will continue identify and implement opportunities for school and community improvements related to active transportation (i.e., walking and biking) and public transportation.

<table>
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<tbody>
<tr>
<td>Increase number of residents knowledgeable about transportation options by 20 percent.</td>
<td>Ongoing</td>
<td>Number of residents who report using transit or active transportation</td>
<td>1,530 MT CO2e</td>
</tr>
</tbody>
</table>

Strategy TL9: Support Transportation Demand Management

The City will support transportation demand management (TDM) programs within private businesses by continuing to employ a staff member responsible for enforcement of the Bay Area and Richmond Commute Benefits Ordinances. This staff member will continue to help businesses comply with these ordinances, and will also promote additional TDM strategies, particularly for larger businesses where these strategies are the most effective. The City will also consider new ways to incentivize TDM strategy implementation alongside basic compliance.

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<tbody>
<tr>
<td>10 percent increase in participation and number of employees provided transit subsidies and a doubling of employees able to work from home (from 5 percent to 10 percent) at least one day a week.</td>
<td>Ongoing</td>
<td>Percent participation in TDM programs Percent of employees able to work from home one day per week</td>
<td>3,097 MT CO2e</td>
</tr>
</tbody>
</table>

Objective 4: Zero Waste

Reduce the City’s overall waste stream by reducing the City’s consumption of goods and materials, and by adopting a zero-waste philosophy. Promote waste reduction and recycling to minimize materials that are processed in landfills.

Solid waste that decomposes in landfills generates methane gas (CH4), a GHG that is at approximately 25 times more potent than carbon dioxide (CO2) over a 100-year time frame, and even more potent over shorter time spans (see inset). GHG emissions resulting from the decomposition of solid waste account for approximately five percent of the 2012 Community Inventory. In addition, the collection, transportation, and handling of waste cause emissions from trucks and facility operations. Waste reduction and diversion programs prevent materials from ending up in landfills, and recycling reduces GHG emissions associated with the energy embodied in material goods and their packaging.

The City, through its franchise agreement with Republic Services, currently offers garbage collection, recycling, and food-scrap composting collection services to residents and businesses within Richmond. Garbage, recyclables and green waste are picked up weekly for residential customers. Customers pay for garbage collection services, while recycling and composting services and materials are offered free of charge. Richmond has implemented a volume-based fee structure for garbage collection services, or Pay-As-You-Throw (PAYT) collection, that charges customers based on the volume of the garbage container service subscription, and the frequency of pickup. Customers who use smaller containers for garbage are charged less money, thus creating a financial incentive to increase composting and recycling. Meanwhile, the City has made great strides in reducing illegal dumping in its neighborhoods with the Bulky Item and On-Call Cleanup programs.
The Importance of Methane Reduction

The State of California is actively working to reduce methane emissions as part of broader efforts to reduce “Short-Lived Climate Pollutants” (SLCPs). Methane is a powerful greenhouse gas that remains in the atmosphere for a much shorter period of time than carbon dioxide (CO2). However, its relative potency, when measured in terms of how it heats the atmosphere, is at least 25 times greater than that of CO2 over a 100-year time frame, and more than 80 times more potent than CO2 over a 20-year span. Reducing methane emissions can make an immediate beneficial impact on climate change.

California’s 2014 Climate Change Scoping Plan Update contains actions to reduce SLCPs, including methane, and SB 605 (Lara, Chapter 523, Statutes of 2014) directs ARB to develop a comprehensive SLCP strategy by January 1, 2016. California has taken, and will continue to take, steps to reduce methane emissions from the agricultural, waste treatment, and oil and gas sectors.

For more information on methane’s impact on climate change and reduction strategies, see the California Air Resources Board website at http://www.arb.ca.gov/cc/shortlived/shortlived.htm.

The City will continue to encourage waste diversion from landfills by promoting recycling, composting, and the appropriate disposal of hazardous waste. Republic Services provides educational materials through bill inserts, quarterly newsletters, and on its website to help customers properly dispose of their waste. RecycleMore, the regional recycling agency, is tasked with ensuring Richmond and its neighboring cities achieve the solid waste diversion goals established by the State. RecycleMore has several programs aimed at helping residents, businesses, and institutions achieve Zero Waste by promoting backyard composting, construction and demolition (C&D) diversion, the adoption of reusable bag ordinances, and proper hazardous waste disposal. RecycleMore also offers free workshops, field trips, and classroom presentations to schools in Contra Costa County.

Contra Costa County Green Business Program, as part of the Bay Area Green Business Program, provides certifications to businesses that demonstrate compliance with certain environmental regulations and that implement certain practices and procedures that are considered environmentally sustainable. Some of these practices include waste diversion through enhanced recycling and composting, environmentally preferable purchasing policies, best practices in source reduction (i.e., double sided printing, reduced printing, and/or reduced junk mail) and reuse of waste materials where possible.

The City will work with its franchise haulers to increase commercial and multi-family recycling and organics diversion by setting service rates that incentivize diversion. In addition, the City will work with RecycleMore to adopt a Zero Waste Ordinance that sets a goal to achieve maximum waste diversion by 2030. The City will also develop a Zero Waste Strategic Plan to outline a path to achieving the target established in the ordinance. The Strategic Plan would include: strategies to expand existing recycling and composting facilities; various regulations and incentives to reduce total waste disposed by residents, businesses, and institutions; programs to educate the public on Zero Waste strategies and promote the participation of community members; and policies to advocate for manufacturer responsibility for product waste.

Composting at Schools: It’s the Law

Current California law requires schools and school districts that generate four cubic yards or more of waste per week to recycle, and requirements commenced on April 1, 2016:

- April 1, 2016: Schools that generate eight cubic yards of organic waste per week shall arrange for organic waste recycling services.
- January 1, 2017: Schools that generate four cubic yards of organic waste per week shall arrange for organic waste recycling services.
- January 1, 2019: Schools that generate four cubic yards or more of commercial solid waste per week shall arrange for organic waste recycling services.
The City will work with RecycleMore and WCCUSD to develop programs at Richmond schools, and work with WCCUSD staff to ensure they have the resources needed to increase solid waste diversion at each school facility. Specifically, the City will support WCCUSD in implementing a District-wide three-bin collection system for trash, recycling, and compost. School programs will develop educational activities for students, faculty, and parents to increase awareness of recycling best practices.

As of July 1, 2014, CALGreen, the State’s Green Building Standards Code, requires jurisdictions to divert a minimum of 50 percent of the nonhazardous construction and demolition (C&D) waste from landfills. C&D debris typically includes materials such as lumber, drywall, metals, masonry, carpet, plastic, and other building materials. Richmond will promote the deconstruction of buildings, rather than demolition, in which buildings are carefully disassembled and component parts are recycled or locally repurposed and reused. When buildings are demolished, workers, neighbors and the environment can be exposed to toxic chemicals. The deconstruction of buildings requires that developers plan how to manage materials after the building is deconstructed, and in doing so identify hazards or potentially dangerous waste.

Recycling and waste reduction results in numerous co-benefits for residents and business owners. Diverting waste from landfills reduces the City’s reliance on landfills, which can be costly to permit and locate in or near an urbanized area. Fewer waste collection vehicles results in less traffic, and better roads and air quality. Minimizing solid waste in landfills can improve community health by reducing exposures to methane gas and toxic stormwater runoff that can contaminate groundwater and surface water.

Another benefit to minimizing waste includes empowering the community to be more environmentally conscious with every day, tangible decisions. As the community works towards zero-waste, residents and businesses may become more conscious consumers. The zero-waste approach to food preparation can result in healthier, less processed, and more affordable food. Additionally, community members may save money by reducing trash bills or repairing existing material possessions instead of purchasing new ones.

General Plan 2030 Alignment

CAP Objective 4 supports following General Plan 2030 policy:

- **Policy EC3.3 Solid Waste Reduction and Recycling.** Promote waste reduction and recycling to minimize materials that are processed in landfills.

The General Plan includes Goal EC3 (Sustainable and Efficient Energy Systems) that includes reducing the City’s overall waste stream by reducing the City’s consumption of goods and materials, and adopting a zero-waste philosophy.
### Objectives and Strategies

#### Strategies for Solid Waste

<table>
<thead>
<tr>
<th>GHG Reduction:</th>
<th>Health Co-benefits:</th>
<th>Other Co-Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>52,755 MT CO2e by 2030</td>
<td>Improved air quality, reduced exposure to toxic materials, reduced potential for ground water and surface water contamination</td>
<td></td>
</tr>
</tbody>
</table>

#### Strategy SW1: Establish a Zero Waste Framework

The City will implement Zero Waste strategies aimed to prevent waste, and increase recycling, reuse, and composting of waste materials so that fewer materials are sent to landfills. Strategies will include but not be limited to developing a Zero Waste Ordinance and a Zero Waste Strategic Plan.

<table>
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<tbody>
<tr>
<td>By 2030, 90 percent of all solid waste is diverted from landfills.</td>
<td>Ongoing; Adopt Zero Waste Ordinance by 2017</td>
<td>Citywide solid waste generation, Percent solid waste diverted from landfill</td>
<td>48,421 MT CO2e (this accounts for Strategies SW1 through SW5)</td>
</tr>
</tbody>
</table>

#### Strategy SW2: Increase Participation in Recycling Programs and Incentives

The City will work with local waste haulers and agencies to increase recycling and composting, and ensure appropriate disposal of hazardous waste.

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<tbody>
<tr>
<td>By 2030, 90 percent of all solid waste is diverted from landfills.</td>
<td>Ongoing</td>
<td>Annual tonnages of recyclables and organics diverted from landfill</td>
<td>Accounted for in Strategy SW1</td>
</tr>
</tbody>
</table>

#### Strategy SW3: Establish and Support Garbage Collection Service Rates and Schedules that Maximize Participation in Composting and Recycling Programs

The City will work with its franchise haulers to increase commercial and multi-family recycling and organics diversion by setting garbage service rates (i.e., costs) and schedules that incentivize diversion.

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<tr>
<td>By 2030, 90 percent of all solid waste is diverted from landfills.</td>
<td>Ongoing</td>
<td>Citywide solid waste generation, Annual tonnages of recyclables and organics diverted from landfill</td>
<td>Accounted for in Strategy SW1</td>
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</table>
Objective 5: Water Conservation

Promote the use of existing and develop new incentives to encourage schools, government facilities, residences, commercial businesses, and industrial users to reduce water consumption and increase the use of graywater and recycled water. Promote water efficient features and landscaping in all new development.

While GHG emissions associated with the energy needed for pumping and conveyance of water represent less than 1 percent of the Community Inventory, strategies to reduce water consumption have important co-benefits to the local water supply and they are outlined here to support water conservation goals established by the State and by East Bay Municipal Utilities District’s (EBMUD’s) Urban Water Management Plan (UWMP).

Maintaining a safe and plentiful water supply is a basic necessity for individuals and communities. Promoting conservation programs and supporting water infrastructure improvements helps to maintain the quality and reliability of tap water and prevents consumers from having to purchase bottled water. Water conservation can offer financial savings allowing families to spend more money on healthy food, health care, housing, or other necessities. Identifying and fixing leaking pipes can reduce or prevent the unhealthy growth of indoor molds and mildews which can improve indoor air quality, reduce allergens, and improve respiratory health. Replacing lawns with drought tolerant native plants and trees can expand the City’s urban forest and provide a shade and a cooling effect for residents, especially for those in homes without air conditioning. Incentive programs can target low-income and communities of color to ensure an equitable distribution of resources.

A wide range of outreach and conservation programs are available to Richmond residents and businesses. EBMUD, the water provider for the City of Richmond, offers a variety of incentives to encourage customers to reduce indoor and outdoor water consumption during normal and dry years. EBMUD’s WaterSmart Calculator helps households calculate their water use and identify areas where efficiency improvements may conserve water and save money. Residents
may sign up for My Water Report for bi-monthly statistics on their water use compared to other similar households. The Home Survey Kit can help a household identify leaking toilets, high-flow fixtures, and irrigation components that may be resolved through simple fixes or replacements. Alternatively, residential customers may opt for an On-Site Home Water Survey completed by EBMUD. On its web site, EBMUD also offers simple tips and advice for saving water. Rebates are provided for: toilet replacement, clothes washer upgrades, and installation of graywater systems. EBMUD also offers free low flow showerheads, faucet aerators, hose nozzles, shower diverters, and dye tablets (for detecting toilet leaks).

EBMUD’s WaterSmart Gardener program provides incentives, outreach, and education for outdoor water conservation, including: rebates for converting lawn space to water efficient landscaping; information on installing drip irrigation; irrigation surveys; landscape water budgets; rebates for graywater system installation; grants for creating community gardens; and a multitude of resources for designing and installing water efficient landscapes.

EBMUD offers similar resources and incentives for business customers, including Water Surveys and Water Budgets, a variety of rebates for indoor and outdoor efficiency upgrades, and a WaterSmart Guidebook with information on water saving technologies for new design and retrofits. The EBMUD WaterSmart Business Certification Program works with customers to identify and implement water saving measures.

In addition, EBMUD offers a wide variety of resources and programs to support water conservation education in the West Contra Costa Unified School District (WCCUSD). EBMUD offers free water conservation workbooks and water pollution prevention materials to all public and private schools in its service area. EBMUD deploys ranger-naturalists in an outdoor classroom setting to promote watershed stewardship through teaching students about creek restoration, reforestation, and other natural history programs. At Contra Costa County science fairs, EBMUD offers an Excellence in Water and Wastewater Research Awards that recognize water related projects and provide cash prizes. Through the Drought Education Theater Program, EBMUD partnered with three theater groups to provide 20-minute educational theater shows teaching the importance of water conservation, each using a unique approach.

EBMUD offers WaterSmart garden grants that can be used to fund the design and construction of community gardens or urban farm projects that demonstrate water conservation principles. In partnership with Water Education for Teachers and the Water Education Foundation, EBMUD provides periodic training sessions to teachers through the Project WET Teacher Training program, which covers various water topics that teachers can use to enhance their curriculum in line with Common Core and Next Generation Science Standards.

Are Property Assessed Clean Energy (PACE) Programs for Water Too?

Yes! PACE programs provide financing for water efficiency and conservation improvements such as solar thermal, low flow bathroom fixtures, high efficiency toilets, lawn replacements, and more. The repayment of the loan is collected on the property owner’s tax bills over the course of several years, and the loan remains with the property if it is sold. Since the loan is tied to the property, it provides less risk to property owners to undertake water efficiency measures with a longer term payback.

There are currently three PACE programs available to businesses and residents in Richmond: HERO Financing, California First Efficiency Financing, and Figtree Financing. The City has adopted an open marketplace policy and will add additional PACE programs as they become available.
Reclaiming Water in Richmond

Water reclamation is reusing treated wastewater for beneficial purposes such as agricultural and landscape irrigation, industrial processes, toilet flushing, and replenishing a ground water basin (referred to as ground water recharge).

EBMUD operates two water reclamation facilities in Richmond, the North Richmond Water Reclamation Plant and the Richmond Advanced Recycled Expansion (RARE) Water Project, that combined can produce up to 8.9 million gallons a day (mgd) of recycled water.

In addition, the City of Richmond owns and operates the Richmond Municipal Sewer District, which provides service to an area that encompasses 13.5 square miles in the City. The District’s wastewater treatment plant located in Point Richmond treats the wastewater collected by the District. The City will work with the District to begin evaluating reclamation projects within the Port of Richmond and nearby commercial areas.

The City will further support green building strategies for water conservation, by ensuring the successful implementation of the California Green Building Standards (CalGREEN) Code, which requires new construction and major remodels to use high efficiency plumbing fixtures, including toilets, urinals, showerheads, and faucet fixtures. For outdoor water use, CalGREEN maintains that irrigation controllers shall be weather- or soil-moisture based, and shall automatically account for rainfall, or else be attached to a rainfall sensor. The City may also offer incentives to comply with the water efficiency requirements of the GreenPoint Rated system and/or the U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED) Standards.

In addition, the City is committed to improving and expanding the water supply, water reclamation (recycling), and water reuse infrastructure in Richmond. The City will support EBMUD’s efforts to expand recycled water use to serve its City of Richmond customers, and support the use of graywater and rainwater catchment systems by local residents and businesses. The City will support EBMUD’s efforts to maintain and upgrade water infrastructure and conveyance systems to minimize leaks and prevent waste.

General Plan 2030 Alignment

CAP Objective 5 supports the following General Plan 2030 policies:

- **Policy EC3.4 Water Conservation and Reuse.** Promote water conservation and recycled water use.
- **Policy EC3.5 City Government Operation.** Promote climate-friendly standards, practices, technologies and products in all City facilities and operations.
- **Policy EC4.3 Green Buildings and Landscaping.** Require energy and resource efficient buildings and landscaping in all public and private development projects.
- **Policy EC4.4 Green Infrastructure.** Develop green infrastructure standards that rely on natural processes for stormwater drainage, groundwater recharge and flood management.
## Strategies for Water Conservation

<table>
<thead>
<tr>
<th>GHG Reduction:</th>
<th>Health Co-benefits:</th>
<th>Other Co-Benefits (Symbols)</th>
</tr>
</thead>
<tbody>
<tr>
<td>800 MT CO2e by 2030</td>
<td>Reduced mold, reduced illness, increased indoor comfort, reduced incidents of heat-related illness</td>
<td>$\text{$}$, $\text{\leaf}$, $\text{\hand}$, $\text{\leaf}$, $\text{\hand}$</td>
</tr>
</tbody>
</table>

### Strategy WA1: Promote East Bay Municipal Utilities District (EBMUD) Outreach and Conservation Programs

The City will promote programs EBMUD outreach and conservation programs (WaterSmart Calculator, water surveys, WaterSmart Gardener, WaterSmart Business Certification, etc.), as well as Property Assessed Clean Energy (PACE) programs that provide financing for water efficiency and conservation improvements.

<table>
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<tr>
<td>By 2020, 20 percent per capita reduction in water consumption from 2012 levels (per Senate Bill 7x); by 2030, 30 percent per capita reduction.</td>
<td>Ongoing</td>
<td>Gallons saved per year Citywide</td>
<td>800 MT CO2e</td>
</tr>
</tbody>
</table>

### Strategy WA2: Expand School Programs

The City will expand upon existing water conservation efforts in schools in the West Contra Costa Unified School District (WCCUSD) to further engage students through water usage assessments, water reduction targets, and tracking programs of school facilities to teach students how to perform a water audit, with a follow up assignment to apply these auditing, target setting, and tracking skills at home.

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<tr>
<td>25 percent of WCCUSD schools participating in water conservation programs by 2020; 100 percent participating by 2030.</td>
<td>Ongoing</td>
<td>Percent of schools participating in EBMUD programs</td>
<td>N/A (Supporting action)</td>
</tr>
</tbody>
</table>

### Strategy WA3: Green Building Strategies for Water Conservation

The City will employ a variety of strategies to reduce water use via green building techniques, such as ensuring that all projects demonstrate compliance with, at minimum, the 2013 CalGREEN standards; offering incentives for certification through GreenPoint Rated, LEED, or other green building rating systems; considering adopting a retrofit-on sale ordinance in conjunction with a Building Energy Saving Ordinance (BESO); and providing information to developers, homeowners, and businesses on water efficiency and green building rating systems.

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<tr>
<td>100 percent compliance with CalGREEN Code or more stringent water standards.</td>
<td>Ongoing</td>
<td>CalGREEN compliance Number of GreenPoint rated or LEED certified buildings</td>
<td>N/A (Supporting action)</td>
</tr>
</tbody>
</table>

### Strategy WA4: Support Water Infrastructure Improvements and Expand Water Reclamation and Reuse

The City will support EBMUD’s efforts to expand recycled water use to serve its City of Richmond customers, and support the use of graywater and rainwater catchment systems by local residents and businesses. The City will support EBMUD’s efforts to maintain and upgrade water infrastructure and conveyance systems to minimize leaks and prevent waste.

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<tbody>
<tr>
<td>Annual increases in the number of graywater and rainwater catchment permits issued; increase in capacity of purple pipe installed and volume of reclaimed water provided to City by Richmond Municipal Sewer District.</td>
<td>Ongoing</td>
<td>Number of graywater and rainwater catchment permits issued</td>
<td>N/A (Supporting action)</td>
</tr>
</tbody>
</table>
Objective 6: Green Infrastructure, Urban Forestry and Agriculture

Restore and protect the natural environment to help sequester GHG emissions and mitigate impacts of climate change, while updating Richmond’s built environment to also allow the City to adapt to potential climate change impacts such as sea-level rise and flooding. Promote development standards and land use patterns that encourage long-term sustainability, such as supporting the restoration of natural features and ecological systems to support the natural functions of soil, water, tree canopies, creeks, open space and other natural resources. Protect neighborhoods, infrastructure, buildings, and other facilities from the impacts of climate change such as sea level rise, and flooding. Collaborate with local urban agriculture and tree planting organizations to identify sites with urban forestry and/or agriculture potential.

Green infrastructure uses vegetation, soils, and natural processes to manage water and improve the overall health of urban environments. Traditionally, stormwater runoff travels from rooftops, streets, and parking lots into the City’s sewer or storm drainage system, which directs discharged water into nearby water bodies, including the San Francisco and San Pablo bays. As runoff travels across impervious surfaces, it collects garbage, bacteria, heavy metals, oil, and other pollutants from the urban environment that are released along with the runoff, degrading the quality of the receiving waters. In addition, runoff travels more rapidly through urban environments, resulting in erosion and flooding that may damage habitat, property, and infrastructure. By partially retaining runoff onsite, green infrastructure systems reduce the quantity of stormwater sent to the City drainage system, which in turn reduces the amount of pollutants being discharged in nearby water bodies, and reduces physical damage resulting from flooding and erosion. Instead, stormwater runoff permeates the soil, reducing the need for irrigation, and recharges groundwater. Green infrastructure benefits flood control, water supply, pollution reduction, recreational open space, urban agriculture, and urban wildlife habitat.
Urban trees provide aesthetic, environmental, and economic benefits including cleaner air, arboreal habitats, and increased property values. The State of California recognizes the key role that forests, including urban forests, and all natural and working lands must play in meeting the state’s GHG emission reduction goals, by providing a carbon sink that removes CO2 from the atmosphere.\(^\text{11}\) Urban trees also help lower peak-load energy demands during the hottest months, providing shade for parking lots and other paved areas, reducing the urban heat island effect. Properly selected and located shade trees can help reduce air conditioner use and associated energy costs. Forested parks and tree-lined streets mitigate the impact of the urban heat island and minimize local climate by cooling and cleaning the air. Public parks and green spaces allow people to congregate, socialize, and be more physically active. Making public parks and green spaces available and accessible to all residents is an important City priority.

Several volunteer organizations support the expansion of Richmond’s urban forestry through canvassing and planting trees, providing ongoing tree care, organizing community events, education, and sharing best practices. The City will continue to collaborate with community-based organizations (e.g., Richmond Trees, Groundwork Richmond) to organize plantings of shade trees along public right-of-ways. The City will also work with community-based organizations to continue to promote the Adopt-A-Tree program, and will distribute existing resources providing tree care tips.

\(^\text{11}\) California Air Resources Board (CARB), 2014: First Update to the Climate Change Scoping Plan, May 2014.
Richmond’s current zoning locates agricultural uses primarily on the eastern edge of the City, adjacent to Wildcat Canyon Regional Park. Despite Richmond's close proximity to major agricultural hubs such as the Napa Valley, Sonoma County, and the Central Valley, some economically disadvantaged areas within the City are considered “food deserts” where access to fresh and affordable foods is disproportionately lower than in other areas. To confront this challenge, the City helps support a local food system by promoting urban agriculture and connecting local farmers with Richmond residents through farmers markets and community programs. In addition, resident gardening and urban agriculture incorporate food production into our City's green infrastructure and culture. The Richmond Urban Agriculture Assessment has identified opportunity sites for urban agriculture on underutilized parcels, roof tops, within courtyards, and other public areas within such neighborhoods. Distributed urban agriculture sites increase access to food and reduce the GHG emissions associated with transporting food over long distances to reach consumers.

A ll of these actions can improve access to healthy foods and better nutrition, which in turn helps prevent obesity and type 2 diabetes. Low-income residents are particularly affected by diet-related diseases and will benefit from improved healthy food access. Local agriculture also benefits GHG emissions reduction by reducing the transportation needed to supply food to local residents.

**General Plan 2030 Alignment**

CAP Objective 6 supports the following General Plan 2030 policies:

- **Policy EC4.4 Green Infrastructure.** Develop green infrastructure standards that rely on natural processes for stormwater drainage, groundwater recharge and flood management.

- **Policy LU6.4 Long-Term Environmental Sustainability.** Promote development standards and land use patterns that encourage long-term sustainability.

- **Policy EC4.5 Local Food System (Urban Agriculture).** Collaborate with local urban agriculture advocates to identify sites with urban agriculture potential.

- **Policy EC6.1 Habitat and Biological Resource Protection and Restoration.** Natural habitat is essential to ensuring biodiversity and protecting sensitive biological resources.

- **Policy EC6.2 Low-Lying Areas in Richmond.** Protect and manage low-lying areas that are likely to be affected by sea level rise and storm surges.

- **Policy EC6.3 Adapting to Climate Change.** Prepare for and adapt to future impacts of changing weather patterns and sea level fluctuations.
### Strategies for Green Infrastructure, Urban Forestry and Agriculture

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<th>GHG Reduction:</th>
<th>Health Co-benefits:</th>
<th>Other Co-Benefits</th>
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<tbody>
<tr>
<td>1,081 MT CO2e by 2030</td>
<td>Reduced heat related illness, improved air quality, lower energy costs, improved nutrition, decreased obesity, decreased illness and premature mortality</td>
<td></td>
</tr>
</tbody>
</table>

#### Strategy GA1: Support Urban Tree-Planting Programs

The City will continue to collaborate with community-based organizations to organize plantings of shade trees along public right-of-ways, promote the Adopt-A-Tree program, and distribute existing resources providing tree care tips. The City will consider developing a shade tree incentive program that provides a rebate or covers the full cost of the tree.

<table>
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<tbody>
<tr>
<td>5 percent of all new and existing homes in Richmond will plant a shade tree by 2030.</td>
<td>Ongoing</td>
<td>Annual trees planted by residents, Number of homes and businesses participating in tree planting program</td>
<td>1,081 MT CO2e</td>
</tr>
</tbody>
</table>

#### Strategy GA2: Support Local Agriculture and Food Production

The City will promote urban agriculture to increase access to healthy food; continue to promote its weekly farmers markets; partner with schools and other community organizations to bring urban agriculture to neighborhoods, schools, and parks; and use its purchasing power to advance locally-produced and health eating options.

<table>
<thead>
<tr>
<th>Performance Goal</th>
<th>Timeframe</th>
<th>Tracking Metrics</th>
<th>GHGs Reduced - 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double the acreage of urban gardens in Richmond from baseline conditions by 2030.</td>
<td>Ongoing</td>
<td>Number of urban and school gardens, Acreage of urban gardens, Number of weekly farmer’s markets</td>
<td>Not calculated; supporting action</td>
</tr>
</tbody>
</table>

#### Strategy GA3: Support Green Infrastructure and Streetscape Design

The City will encourage property owners and developers to incorporate green infrastructure (e.g., bioswales, permeable pavement, rainwater catchment, planter strips, etc.) into existing and new developments, continue to utilize the same green infrastructure design principles in City-owned property as outlined in the City’s Parks Master Plan, incorporate green infrastructure into new City developments, and retrofit existing City facilities with green infrastructure as funding becomes available.

<table>
<thead>
<tr>
<th>Performance Goal</th>
<th>Timeframe</th>
<th>Tracking Metrics</th>
<th>GHGs Reduced - 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase green infrastructure projects Citywide by 2030.</td>
<td>Ongoing</td>
<td>Number of green infrastructure projects completed annually</td>
<td>N/A (Supporting action)</td>
</tr>
</tbody>
</table>
Objective 7: Green Business and Industry

Reduce and mitigate carbon dioxide and other GHG emissions from large commercial and industrial sources. Promote "green" industries while providing jobs and training to Richmond residents. Encourage existing businesses and industries to become environmentally advanced and continue making positive contributions to the community. Work with businesses and industry, residents, and regulatory agencies to reduce the impact of direct, indirect, and cumulative impacts of pollution from industry, the Port, railroads, diesel trucks, and busy roadways.

Commercial businesses and industrial facilities in Richmond use large quantities of natural gas and electricity for lighting, heating, cooling, ventilation, computers, electronics, refrigeration and other office equipment and processes. Many also emit significant quantities of short-lived climate pollutants (SLCPs) that have an outsized impact on atmospheric warming, including industrial refrigerants like hydrofluorocarbons (HFCs). The strategies under this objective will help reduce emissions of GHGs, SLCPs, and criteria pollutants, leading to cleaner air and better public health.

California's Cap and Trade program is the cornerstone of the State's strategy to reduce GHG emissions from electric power plants, oil and gas producers, and large industrial plants. Regulated facilities under the program generate approximately 85 percent of the State's total GHG emissions. Starting January 1, 2012, an overall limit on GHG emissions from capped sectors was established and facilities subject to the cap are now issued trade permits (allowances) to emit GHGs, through a mix of free allocation and quarterly auctions. Regulated entities can purchase or sell allowances in the carbon market as needed to meet their emissions obligation. The quantity of allowances declines approximately 3 percent each year, thereby increasing industry incentive to invest in clean technologies. The quantity of allowances under California's program is flexible and can be reduced at an accelerated rate if the State’s other measures to reduce GHG emissions have less impact than anticipated. The Cap and Trade program therefore acts as a backstop to ensure that the State's overall GHG target is met.

Richmond is also committed to reducing industrial carbon emissions through promotion of other existing programs. PG&E’s Permanent Load Shift – Thermal Energy Storage Program offers financial incentives for their commercial/industrial electricity customers to implement technologies that permanently shift electric load by storing thermal cooling capacity during off-peak hours (e.g., by chilling water or making ice) in order to meet cooling load during subsequent peak hours. California Public Utilities Commission's (CPUC) Self-Generation Incentive Program (SGIP), administered through PG&E provides incentives to businesses to support existing, new, and emerging distributed energy resources, including energy storage systems and efficient combined heat and power systems. In addition, local public agencies and equipment owners involved in the movement of freight can apply for grants from CARB's Goods Movement Emission Reduction Program, administered through BAAQMD, which provides funding for equipment that reduces air pollution emissions and health risk from freight movement along California's trade corridors. The program currently provides funding for truck replacements, truck engine repowering, truck charging/fueling infrastructure and truck stop electrification projects.

Large Industrial Sources in Richmond

There are three entities operating in Richmond that are subject to the California Cap and Trade program: the Chevron Richmond Refinery, the West Contra Costa County Landfill, and New NGC, Inc. (National Gypsum). The Chevron Refinery alone accounts for the vast majority of the City's total emissions, as demonstrated in Chapter 3. Chevron's GHG emissions are also regulated by the Conditional Use Permit the City recently issued for the Chevron Refinery Modernization Project, as described in Chapter 3. The City will continue to partner with capped entities, CARB, and BAAQMD to support compliance with AB 32 Cap and Trade emissions reduction targets for regulated industries, and to support the BAAQMD requirement that requires the installation of best-available control technology for businesses and industry during the entitlement process.
Other strategies in this section focus on supporting green businesses that help reduce community GHG emissions, and attracting businesses in the “cleantech” industry that are developing the innovative solutions needed to achieve deep GHG reductions across the state (and global) economy. With an abundance of marketable assets, including robust transportation and transit networks, proximity to world-class universities and urban innovation centers, and relatively affordable real estate, Richmond is well-positioned to attract economic growth in the bioscience and green/clean technology sectors, and has set a long-term vision to be nationally recognized for business development in these sectors. There is tremendous entrepreneurial opportunity in developing and marketing new technologies and services that are geared toward reducing the GHG footprint of energy, transportation, agriculture, water, materials, waste management, and land management.

Richmond Green Business Highlight: Hero Arts

Hero Arts is a Certified Green Business that designs and manufactures art supplies in Richmond. Hero Arts is committed to reducing their carbon footprint. In 2005, they pledged to reduce packaging, waste, and energy consumption, and carbon emissions, by 90% over 10 years. Today, their Richmond warehouse is lined with windows and glass rolling doors to let in sunlight and act as a natural heat sinks, eliminating the need for heat and lighting, and in side rooms, sensors now turn off lights when rooms are not in use. They have also eliminated all toxics chemicals and solvents in all manufacturing processes and products, and require all suppliers to sign a green a pledge to do the same. Through these efforts, in 5 years they reduced their GHG emissions by 240 tons and electricity usage by 15%, saving the company an estimated $6,000.

Source: Hero Arts, 2016.
The City is already home to many prominent, innovative green businesses and clean tech companies, including Sunpower and Heliodyne, and is poised to become a new center of innovation in the low carbon economy. There are multiple programs in the private sector that provide incubator services to businesses in the Bay Area. The East Bay Economic Development Alliance (EDA) provides services, analysis and cross sector partnerships, and have created a guide to help grow small and medium sized businesses and develop industries throughout the Bay Area. EDA is particularly dedicated to growing the region’s international economic focus by providing assistance to companies interested in importing and exporting products, trading with foreign nationals, and working with local maritime ports. Other organizations include: AnewAmerica Community Corporation, which offers a three-year program of support for micro-business incubation, asset building, and social responsibility; and Communications Technology Cluster (CTC) which is a business acceleration center providing strategic consulting, business and financial services.

RichmondBUILD

RichmondBUILD is a public private partnership aimed at providing job training and hands-on experience in solar installations and green industry businesses. This unique training opportunity delivers a triple benefit: participants experience effective, real-world training in solar installation; homeowners receive a solar system financed by a low-interest loan that immediately reduces their energy bills; and the planet benefits from a reduction in carbon emissions.

All of RichmondBUILD students are low-income and most are young people of color, including those with a history with the justice system. Since 2007, more than 200 participants have graduated receiving an average wage of $18.33 an hour, while maintaining a robust job retention rate of 85 percent.
Objectives and Strategies

The growing green economy is attracting new industry while helping the City achieve its GHG reduction goals. Investing in renewable energy creates living-wage, green collar jobs, generates local business revenue, and spurs economic growth. The City will promote growth of its green business and industry sectors and support training and development of a local workforce that has the skills to support the City’s economic future. Focusing workforce development program opportunities within underemployed and low-income communities will ensure that all of the City’s youth and communities are included in the transition to a cleaner, more sustainable economy.

Since 2007, the RichmondBUILD program has offered 35 low-income and at-risk youth trainings in the construction and renewable energy fields each year. Participants complete the core Carpentry Pre-Apprenticeship track, and 80 percent of graduates are placed in jobs paying an average of $18.33 an hour utilizing the skills they were taught. The Rising Sun Energy Center’s Green House Calls program offers summer job training for youth ages 15-22 in outreach, customer service, and energy efficiency. Participants work in teams to perform energy efficiency audits for customers, install simple energy efficiency upgrades, and provide advice to residents on ways to further increase their energy savings. The City’s YouthWORKS program provides case-managed services to at-risk and in-risk youth ages 16 to 21. The program provides pre-employment training and life skills, among other services. The Solar Richmond program offers solar training and green business ownership opportunities for low income and under-employed residents. Serving as a solar and green-jobs advocate, the program works with partners to promote solar and inclusive green economic development in Richmond and the greater Bay Area.

General Plan 2030 Alignment

CAP Objective 7 supports the following General Plan 2030 policies:

- **Policy EC5.1 Green Businesses and Jobs.** Promote “green” industries to provide goods and services to fill the growing need for clean and sustainable technologies, fuels, vehicles and equipment, while providing jobs and training to Richmond residents.
- **Policy EC5.2 Environmentally Progressive Businesses and Industries.** Encourage existing businesses and industries to become increasingly environmentally progressive and continue making positive contributions to the community.
- **Policy EC5.3 Air Quality.** Support regional policies and efforts that improve air quality to protect human and environmental health and minimize disproportionate impacts on sensitive population groups.
- **Policy HW6.1 Local Employment Base.** Expand and diversify the local employment base to provide quality jobs for all Richmond residents, especially those that face barriers to employment such as youth, seniors, the formerly incarcerated, and residents with limited English proficiency.
- **Policy HW6.2 Workforce Training and Recruitment.** Support and enhance jobs-skills training and recruitment programs and services.
- **Policy HW6.3 Local Small Businesses.** Promote and support locally owned and cooperative enterprises and businesses, particularly along major corridors, to maximize economic and community benefits for Richmond residents.

Health Co-Benefits of Green Businesses

Promoting the growth of green businesses and industry provides many health co-benefits to business owners and the community in Richmond. Residential neighborhoods located near industrial zones typically have lower income and higher proportions of residents of color than other neighborhoods. As large industries in Richmond reduce their carbon emissions, these residents benefit from reduced pollution levels. Employees, too, benefit when businesses commit to sustainability and reducing emissions. Buildings with good environmental quality can enhance worker performance and reduce the rate of respiratory disease, allergy, asthma, sick building symptoms. By taking steps to ensure compliance with environmental regulations, businesses are protecting the health of their employees.
## Strategies for Green Business and Industry

<table>
<thead>
<tr>
<th>GHG Reduction:</th>
<th>Health Co-benefits:</th>
<th>Other Co-Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,315 MT CO2e by 2030</td>
<td>Improved air quality &amp; comfort, reduced mold, reduced noise pollution, reduced illness and premature mortality</td>
<td></td>
</tr>
</tbody>
</table>

### Strategy GB1: Reduce Industrial Carbon Emissions

The City will partner with local industries, the Bay Area Air Quality Management District (BAAQMD) and the California Air Resources Board (ARB) to ensure compliance with AB32 Cap and Trade emissions reduction targets for regulated industries and local carbon emission limits for industries that are not regulated by AB 32.

<table>
<thead>
<tr>
<th>Performance Goal</th>
<th>Timeframe</th>
<th>Tracking Metrics</th>
<th>Total GHGs Reduced - 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>GHG reduction by local regulated (capped) facilities.</td>
<td>Ongoing</td>
<td>GHG reductions by local regulated (capped) facilities</td>
<td>N/A (Supporting action)</td>
</tr>
</tbody>
</table>

### Strategy GB2: Green Workforce Development

The City will continue to support and expand workforce development programs for the City’s residents and youth through actions such as working with WCCUSD to incorporate green technology education and job training into the curriculum of area high schools; considering partnering with WCCUSD, UC Berkeley, and local industries and businesses to host an annual green tech career fair; and pursuing other technical training programs that could be provided to residents in Richmond.

<table>
<thead>
<tr>
<th>Performance Goal</th>
<th>Timeframe</th>
<th>Tracking Metrics</th>
<th>GHGs Reduced - 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase number of individuals trained for green jobs.</td>
<td>Ongoing</td>
<td>Number of individuals trained, total training hours by discipline or program</td>
<td>N/A (Supporting action)</td>
</tr>
</tbody>
</table>

### Strategy GB3: Support Green/Clean Technology Incubator Programs

The City will promote networking and training organizations in the Bay Area, will promote the various sources of financial assistance available throughout the Bay Area. The City will be home to the UC Berkeley Global Campus at Richmond Bay, and will partner with UC to promote local cleantech industry spinoffs.

<table>
<thead>
<tr>
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<th>Timeframe</th>
<th>Tracking Metrics</th>
<th>GHGs Reduced - 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promote networking and training organizations and raise awareness of financial assistance sources available to entrepreneurs.</td>
<td>Ongoing</td>
<td>Number of local businesses participating in local energy and green business programs</td>
<td>N/A (Supporting action)</td>
</tr>
</tbody>
</table>
Objectives and Strategies

Strategy GB4: Support Participation in Local Energy and Green Business Programs

The City will work with PG&E and MCE to develop an outreach and education plan that targets businesses and industries with the greatest potential for GHG reduction opportunities; cross-promote transportation demand management programs that go beyond the requirements of the Bay Area Commuter Benefits ordinance; educate businesses regarding fuel switching and electrification, reducing reliance on diesel fuel, and reducing hydrofluorocarbons (HFCs); and provide supportive guidance to companies interested in reducing their carbon footprint, and identify ways to promote their accomplishments in the community and throughout the greater Bay Area.

<table>
<thead>
<tr>
<th>Performance Goal</th>
<th>Timeframe</th>
<th>Tracking Metrics</th>
<th>GHGs Reduced - 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximize participation in local energy and green business programs.</td>
<td>Ongoing</td>
<td>Number of businesses locating in Richmond and enrolling in support programs</td>
<td>N/A (Supporting action)</td>
</tr>
</tbody>
</table>

Strategy GB5: Reduce Emissions from Goods Movement

The City will reduce diesel fuel emissions through measures to address goods movement, or the transportation of imported and exported goods through or within the City of Richmond.

<table>
<thead>
<tr>
<th>Performance Goal</th>
<th>Timeframe</th>
<th>Tracking Metrics</th>
<th>GHGs Reduced - 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce Port of Richmond GHG emissions by 20%, below 2005 baseline by 2030.</td>
<td>Ongoing</td>
<td>Port’s MTC02e emissions reduced below 2005 baseline</td>
<td>2,315 MT CO2e</td>
</tr>
</tbody>
</table>

Strategy GB6: Reduce Use of Short-Lived Climate Pollutants (SLCPs)

The City will work with the California ARB, BAAQMD, the Department of Toxic Substance Control, and other agencies to assist local business and industry in choosing or shifting to alternative refrigerants that don’t use hydrofluorocarbons (HFCs). Where feasible, the City shall encourage new development and redevelopments to eliminate the use of HFCs in building construction by using alternative methods of heating and refrigeration.

<table>
<thead>
<tr>
<th>Performance Goal</th>
<th>Timeframe</th>
<th>Tracking Metrics</th>
<th>GHGs Reduced - 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase diversion of organics from landfill, and work with local industry to reduce use of refrigerants and SLCP emissions</td>
<td>Ongoing</td>
<td>SLCP emissions levels, as measured by CARB or BAAQMD</td>
<td>N/A (Supporting action)</td>
</tr>
</tbody>
</table>

Objective 8: Resiliency to Climate Change

Prepare Richmond residents, workers and businesses for future impacts of climate change, including changing weather patterns, sea level rise, prolonged periods of heat exposure, poor air quality, and associated health impacts. Ensure that community-members have access to resources and programs that protect public health. Ensure affordable, safe, and climate-resilient housing, and access to local food and agriculture.

A resilient community is one that is prepared and ready to withstand social and environmental challenges, and can recover equitably from disasters and disruptions. As climate change impacts become more frequent and significant, the City must ensure that the community is resilient in terms of basic survival needs like shelter, food, water, and medical care, but is also prepared for long-term impacts to infrastructure and natural systems that support public health and provide important services to the local economy and the well-being of its residents. In turn, these improvements will enhance community disaster preparedness in general and make Richmond less susceptible to a changing climate.
Objectives and Strategies

Adaptation Study are derived from the county-wide Adapting to Rising Tides project\(^{13}\) led by the Bay Conservation and Development Commission (BCDC).

Climate change presents a significant opportunity and risk to community health in Richmond, threatening to exacerbate existing inequities. Climate change may lead to more extreme weather events, worsened air quality, and increased transmission of infectious disease that could negatively affect community health. The impacts of climate change will not affect everyone equally. It is expected that already burdened and vulnerable populations, such as the elderly, infants and children, minority communities, and people living in poverty, may be disproportionately impacted by climate change. As such, the strategies included in this section encompass actions identified in the Richmond Adaptation Study that will increase Richmond's social, physical, environmental and economic resilience to climate change hazards. Increasing resiliency to climate change means increasing the capacity of the City's residents, infrastructure, response systems, and natural systems to absorb the impacts of climate change. It also means identifying the human populations that are most vulnerable to those impacts, and focusing on social agents that can yield positive change in support of overall resiliency.

Effective resilience-building requires strong governance and a well-developed network of social, political, economic and financial institutions that can take on the work of identifying and addressing the risks posed by climate change.

Many strategies under other CAP objectives also bolster community resilience, including those that support local agriculture, green infrastructure, water conservation, and renewable energy. The strategies under “Resiliency to Climate Change” focus on the aspects of resilience that are not covered under those objectives, including safe and resilient housing, emergency response capabilities, flood management, healthy natural systems, and a local community that is prepared for climate shocks.

13 San Francisco Bay Conservation and Development Commission (BCDC) and the NOAA Coastal Services Center, 2011: Adapting to Rising Tides; project information and resources available at http://www.adaptingtorisingtides.org

Youth and Climate Adaptation

In 2014, the City sought input on CAP strategies and actions from 250 Richmond High School students via the Youth Plan Learn Act Now (Y-PLAN) Program, sponsored by the UC Berkeley Center for Cities + Schools and the City of Richmond. Youth engagement is a key component of creating a healthy and resilient City. By integrating climate change considerations into the school curriculum and their daily environment, students, teachers and school administrators can all play a role in raising awareness about climate change impacts. Finding ways to engage students in understanding both the risks to the community and actions that the City government and community-members can undertake provide a key opportunity to enrich Richmond youth in energy, and environmental science and policy, and will make our future generations more climate conscious citizens.
Objectives and Strategies

Improving community preparedness for climate emergencies is of paramount importance to the City of Richmond. The City will focus on raising community awareness of climate change impacts, vulnerabilities, and risks, and working with government agencies, CBOs, and the community, to increase neighborhood and city-wide resilience. This includes strengthening social networks and emergency response systems to support communities in times of climate emergencies, ranging from floods, extreme heat events, extreme droughts, wildfires, and the cascading impacts that can result from such events.

As part of such efforts, the City will prioritize the health and well-being of its most vulnerable populations (elderly, low-income, and health-compromised residents) who face significant risk from extreme heat events by 2100. These populations will also face higher risk of health problems from worsening air quality and new disease vectors (see Strategy RC6 for actions focused on public health and health equity). The City has an important role, in partnership with public agencies and community based organizations, to educate and engage the public on climate change issues, and to promote community involvement in actions to reduce climate change risks, using linguistically and culturally appropriate approaches that are effective for diverse populations.

As part of its adaptation efforts, the City will develop a comprehensive vision for its extensive shoreline that addresses climate change impacts to private property, commercial and industrial assets, public infrastructure, water quality, ecological protection, public access, public health and recreation. This strategy complements General Plan Action EC6.G, which calls for the City to develop a shoreline protection system that is initially built to accommodate a mid-term rise in sea level of 16 inches, along with an Adaptive Management Plan that outlines an institutional framework, monitoring triggers, and a decision-making process, and creates an entity with taxing authority that would pay for infrastructure improvements necessary to adapt to higher than anticipated levels of sea level rise. The City will engage stakeholders in a discussion on shoreline resiliency that considers multiple objectives, which could lead to more effective capital improvement plans, better access to different financial and material resources, and approaches that provide co-benefits to issues beyond climate change.

Protecting Richmond’s Natural Shoreline

Richmond’s natural shorelines provide an array of recreational, flood protection, and ecosystem service benefits. Natural shorelines help reduce incoming wave heights, protecting shoreline structures from wind waves and tidal energy. Their loss can place shoreline communities at greater risk of flooding by increasing the likelihood that structural shoreline protection is overtopped or fails, and can increase the cost of maintaining, repairing and upgrading these already expensive structural protection assets. Scientific results from regional water quality monitoring programs and ecosystem restoration activities are suggesting the need to adjust priorities for the management of wastewater, sediment and flooding while continuing to protect the Bay’s ecological resources.

In addition, the City will take immediate, short-term steps to reduce risk to climate change exposures and increase local preparedness efforts. Many actions focus on integrating climate change into existing planning and preparedness processes to better understand the vulnerabilities of specific populations to climate change, and to target programs, capacity building, and resources in those areas in culturally- and linguistically-appropriate ways.

The City recognizes the critical role it plays in increasing resilience of local housing and critical infrastructure to climate change. The following sections provide brief summaries of

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14 This is based on a 2012 study by the National Research Council (NRC), Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future, which projects 11 inches of sea level rise in the San Francisco Bay by 2050 (with a range of 5 to 24 inches) and 36 inches by 2100 (with a range of 17 to 66 inches).
the climate change vulnerabilities and associated risks faced by housing and infrastructure, as presented in the City of Richmond Climate Change Adaptation Study (Appendix F).

LOCAL HOUSING
Within the City of Richmond, hundreds of single-family residential parcels are at risk from either current or future flooding that will be more frequent and/or extensive due to sea level rise. Many parcels in Brickyard Cove and Point Richmond are at risk from less than 3 feet of sea level rise, which is also the same water level that could occur during a 50-year return period coastal storm event. Excessively dry periods will increase the risk of wildfires at the urban-wild interface along the eastern portion of the City, endangering nearby homes and property. Public infrastructure at risk includes ground transportation networks, energy infrastructure such as power lines and natural gas distribution networks, water supply infrastructure, wastewater management facilities, and stormwater management infrastructure.

GROUND TRANSPORTATION
The ground transportation infrastructure in Richmond includes railways, state and federal highways, local arterials and access roads, and bridge approaches that are vulnerable to sea level rise and localized flooding. At risk are a number of roads the City of Richmond owns and manages in the Point Richmond, Marina Bay, and Iron Triangle neighborhoods. This includes segments of Richmond Parkway/Castro Street and Central Avenue, which both are major truck and transit routes as well as important arterials for commuters and emergency service vehicles. Current levees are not likely to adequately protect these assets from sea level rise; as an intermediate measure, the City may develop contingency plans for temporary loss of these assets.

Portions of Interstate I-80 (approach to the Carquinez Bridge and San Pablo Avenue interchange) and I-580 (from the Castro Street Interchange to the Contra Costa County line) are also at risk of future flooding and storm events. Even temporary damage or partial closures of these highways could impact traffic at a regional scale. There are limited alternatives to re-routing goods movement, and loss of these segments would have significant impacts on worker access to local and regional jobs, and would greatly affect access to local and regional shoreline recreation.

The rail lines that run through Richmond are critically important, and support important inter- and intra-region goods and commuter movement. Goods moved by rail in Richmond include rail carload commodities (e.g., motorized vehicles and petroleum products other than gasoline or fuel oils) and intermodal rail shipments (shipping containers that can be moved by container ship, rail or truck). The rail lines are also used for passenger drains and freight trains daily. The Union Pacific (UP) rail line in particular is primarily located adjacent to the shoreline and crosses many tidal creeks and channels as well as coastal floodplains. The rail line serves as ad-hoc flood protection in many locations, with some that have tidal marshes and mudflats on the bayside of the rail track that help reduce wind, wave and tidal energy. However, these marshes and mudflats that protect the rail line from erosion and flood damage are themselves vulnerable to sea level rise.

Stronger Housing, Safer Communities
The Association of Bay Area Governments (ABAG) and BCDC recently completed a study, **Stronger Housing, Safer Communities** (2015) that looked at vulnerability and resilience of housing in the Bay Area to flooding from sea level rise, seismic shaking, and liquefaction. The project includes a focused community profile for the Richmond Inner Harbor area, which includes all or part of eight neighborhoods: Atchison Village, Iron Triangle, Santa Fe, City Center, Coronado, Cortez, Marina Bay and Southwest Annex. It also includes all of the City’s Richmond Bay Specific Plan area, the Ford Peninsula major activity center in Marina Bay, and two Districts, Regatta/Marina Bay and Southern Gateway. Much of this area is within the current 100-year flood plain and is susceptible to future flooding as sea level rises. There are also pockets of Bay fill that are susceptible to liquefaction. Many residents in the profile area are very low income and are burdened by housing and transportation costs. Neighborhoods are ethnically diverse with many areas having a high percentage of non-English speaking households. Established residents in the profile area are likely limited in their ability or resources to invest in housing resilience, and are more likely to be displaced if their homes are damaged.
Objectives and Strategies

Given the interconnected nature of rail, and lack of redundancy, a disruption of any segment, either within or outside of Richmond, could have significant impacts. Collaboration between private rail owners (UP and BNSF), local agencies that own or manage adjacent lands, and those that rely on rail either for providing service or for flood protection will be necessary to find and implement appropriate, multi-benefit solutions to address flood risks.

Many roads in the Richmond Hills are in high risk zones for wildfires by the year 2100. The vulnerability of these assets should be better defined, along with consequences of failure and contingency plans in the event they become damaged or inaccessible.

ENERGY INFRASTRUCTURE

Numerous studies by the California Energy Commission\(^\text{15}\) (CEC) and others have highlighted the impact of climate change on California's energy infrastructure, which in turn impacts power availability to the City. Potential negative impacts on the energy grid system include higher temperature stressing power plant capacity, electricity generation, transmission lines, substation capacity, and peak electricity demand; increased wildfire frequency or severity and the resulting impacts near transmission lines; and sea level encroachment upon power plants, substations, and natural gas facilities.

A potential climate risk to the City's natural gas infrastructure is inundation of pipelines and pumping stations due to temporary flooding or sea level rise. Buried pipelines are directly and indirectly sensitive to higher groundwater table and salinity intrusion. Exposure to salt water can corrode pipelines that are not protected as specified in federal and state regulations. Rising groundwater levels could increase liquefaction potential leading to additional damage during a seismic event. In the event of flooding, pipelines that are not weighted or anchored may float and become exposed, particularly during prolonged flooding and in marshy or sandy soils. PG&E's natural gas distribution network includes mains and service lines that which connect customers with the service mains. The location of mains and service lines is restricted information, and is beyond the scope of the City of Richmond Adaptation Study.

WATER SUPPLY

The City's current water supply is highly vulnerable to drought, but the risk of failure is uncertain. The City is dependent on the East Bay Municipal Utility District (EBMUD) for its long-term water supply. EBMUD sources its water from the Mokelumne River Basin which collects snowmelt and runoff from the Sierra Nevada Mountains. California's current long-term drought is putting added emphasis on long-term water security and forcing public agencies to redouble conservation efforts and expand contingency planning. Both EBMUD and the City of Richmond are increasing efforts to improve conservation, upgrade storage and delivery systems, and diversify local water supplies.

EBMUD delivers water to the East Bay through a large and complex conveyance system that includes aqueducts, reservoirs, water treatment plants, pumps, water mains and other infrastructure. Some of this infrastructure is at risk from climate change impact. None of EBMUD's reservoirs or treatment plants in Contra Costa County are at risk of flooding; however, EBMUD relies on the three Mokelumne Aqueducts that could be exposed to flooding as a result of Delta levee failure. These aqueducts provide built-in redundancy but if all three failed, EBMUD would rely on water from a local terminal reservoir that could provide 4-6 months of service. EBMUD has documented reliability risks for all major infrastructures from various hazards, including flooding. Redundancies in the water system that address seismic hazard vulnerabilities could also help avoid service disruption during a flood event.

Sea level rise could have its greatest impact on local water service by increasing salinity in the Sacramento-San Joaquin Delta, impacting EBMUD's water quality. Additionally, increased liquefaction potential during seismic events, storm event flooding, and rising sea levels will increase the potential for failure of Delta levees. Failure of the levees could result in damage to the Mokelumne Aqueducts and disruption of water supply to the entire region. To ensure water supply reliability EBMUD has built redundancy into their distribution and treatment systems. However, as a growing city in the fastest growing county in the Bay Area, with an expected population

growth of 27 percent between 2010 and 2040, Richmond will need to find new opportunities to improve water supply resilience to both accommodate growth and adapt to a changing climate.

**WASTEWATER MANAGEMENT**

The City has three sanitary sewer districts: Richmond Municipal Sewer District, managed by the City of Richmond; West County Wastewater District (WCWD); and Stege Sanitary District (SSD), managed by East Bay Municipal Utility District (EBMUD). Richmond maintains about half of the sewer lines within the City’s boundaries. Many of the residents living in the northern half of Richmond are served by WCWD. Residents in the southern section of the Richmond Annex are serviced by Stege Sanitation District.

Richmond’s wastewater treatment infrastructure is subject to multiple physical and functional vulnerabilities related to sea level rise, as outlined by the Contra Costa County ART Project and summarized in the City of Richmond Climate Change Adaptation Study. The consequences of system disruption or failure would be far ranging:

- A wastewater system disruption could potentially have wide-ranging consequences in the communities serviced by the wastewater treatment plants. Cumulative impacts on commercial and industrial businesses and the associated employment, goods, and services they provide could also be significant. Operations and maintenance cost, as well as capital improvement costs could increase with storm event and sea level rise flooding.

- Wastewater treatment facilities provide a critical public health and safety function. If storm events or sea level rise overwhelm and compromise the system, it could affect a plant's ability to treat and discharge wastewater. Shutdown of the plant would require directing its wastewater to another treatment plant, and/or sewer backups could occur in Richmond, causing residents to be out of their homes at least temporarily and businesses to close.

- If storm events or sea level rise overwhelm and compromise wastewater system assets, untreated sewage could overflow into the environment. Toxic substances and excessive nutrients degrade water quality and harm fish and other aquatic organisms.

**STORMWATER MANAGEMENT**

City stormwater assets that are directly exposed to flooding, or have their lowest elevation below future high tides, are vulnerable to sea level rise. Assets that are not directly exposed but rely on gravity drainage or have insufficient capacity to store and convey both stormwater and Bay water are also vulnerable. Because of their inherent function and location, large pipes, culverts, outfalls, storm gates, weirs, pump stations and force mains are especially at risk. For example, pipes and culverts are larger and carry more flow the closer they are to the receiving waters, and pump stations and their attached force mains are typically located in low-lying areas, such as road underpasses or roads that are below grade. The City has very limited resources to conduct studies to better understand the current condition of the stormwater system and the changes that are needed to reduce its future vulnerability to sea level rise.

The City of Richmond recently conducted an assessment to determine which components of the storm system assets are at risk from 6 feet of sea level rise plus mean higher high water (MHHW) or have their lowest point (invert elevations) below 6 feet of sea level rise. For more information see the City of Richmond Climate Change Adaptation Study (Appendix F), which summarizes key findings from the Contra Costa County ART Project, including a map of affected assets and a table listing the number of collection devices by category, those with invert elevation below 6 feet SLR, and the percent at risk.
Outfalls are the first line of defense against sea level rise in the city’s stormwater system. An exposure analysis conducted by the city indicates that 79 outfalls would be inundated at high tide with 6 feet of sea level rise. As these outfalls do not have storm gates to prevent Bay water from entering the stormwater system, where upstream pipe capacity is insufficient to store both stormwater and Bay water, there could be street and basement flooding during extreme tides or even the daily high tide. This is already a problem in many low-lying areas along the Richmond shoreline where historic marshes were filled for development. Higher water tables associated with sea level rise could also infiltrate the stormwater system and further reduce pipe capacity, and pipes and other infrastructure that was not constructed for saline conditions may be vulnerable to corrosion. Although some of the city outfalls have storm gates, these are often inaccessible to city staff and there is no plan in place to repair and maintain over time.

General Plan 2030 Alignment

CAP Objective 8 supports the following General Plan 2030 policies:

- **Policy EC6.2 Low-Lying Areas in Richmond.** Protect and manage low-lying areas that are likely to be affected by sea level rise and storm surges.
- **Policy EC6.3 Adapting to Climate Change.** Prepare for and adapt to future impacts of changing weather patterns and sea level fluctuations.
- **Policy EC5.31 Air Quality.** Support regional policies and efforts that improve air quality to protect human and environmental health and minimize disproportionate impacts on sensitive population groups.
### Strategies for Resiliency to Climate Change

<table>
<thead>
<tr>
<th>GHG Reduction:</th>
<th>Health Co-benefits:</th>
<th>Other Co-Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA</td>
<td>Improved health equity, better disaster preparedness, lower emotional stress, reduced heat island effect and associated heat-related illness, decreased exposure to infectious diseases</td>
<td><img src="image" alt="Economic Resilience Icon" /> <img src="image" alt="Aesthetics Icon" /> <img src="image" alt="Equity Icon" /> <img src="image" alt="Awareness Icon" /> <img src="image" alt="Environmental Icon" /></td>
</tr>
</tbody>
</table>

#### Strategy RC1: Improve Community Preparedness for Climate Emergencies

The City will raise community awareness of climate change impacts, vulnerabilities, and risks, and will work with government agencies, community-based organizations, and the community to increase neighborhood and city-wide resilience.

<table>
<thead>
<tr>
<th>Performance Goal</th>
<th>Timeframe</th>
<th>Tracking Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Update Local Hazard Mitigation Plan, General Plan Safety Element, and building codes as appropriate to incorporate sea level rise and other climate change hazards</td>
<td>Ongoing</td>
<td>Adoption of updated plans and building codes</td>
</tr>
</tbody>
</table>

#### Strategy RC2: Increase Resilience of Local Housing to Climate Change

The City will increase the resilience of local housing such that physical structures can withstand anticipated climate hazards including sea-level rise and flooding.

<table>
<thead>
<tr>
<th>Performance Goal</th>
<th>Timeframe</th>
<th>Tracking Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Update Local Hazard Mitigation Plan, General Plan Safety Element, and building codes as appropriate to incorporate sea level rise and other climate change hazards.</td>
<td>Ongoing</td>
<td>Adoption of updated plans and building codes</td>
</tr>
</tbody>
</table>

#### Strategy RC3: Increase Resilience of Critical Infrastructure to Climate Change

The City will increase the resilience of critical infrastructure (both existing and planned) such that physical structures can withstand anticipated climate hazards including sea-level rise and flooding.

<table>
<thead>
<tr>
<th>Performance Goal</th>
<th>Timeframe</th>
<th>Tracking Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Update Local Hazard Mitigation Plan, General Plan Safety Element, and building codes as appropriate to incorporate sea level rise and other climate change hazards.</td>
<td>Ongoing</td>
<td>Adoption of updated plans and building codes</td>
</tr>
</tbody>
</table>

#### Strategy RC4: Increase Resilience of Parks and Ecosystems to Climate Change

The City will protect parks, natural areas and ecosystems that provide recreational and aesthetic value, are critical to local flora and fauna, and provide ecosystem services that are valuable to the community.

<table>
<thead>
<tr>
<th>Performance Goal</th>
<th>Timeframe</th>
<th>Tracking Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Update the City's Parks Master Plan to incorporate sea level rise and other anticipated climate change impacts; protect vulnerable local and regional park assets.</td>
<td>2018</td>
<td>Adoption of updated parks Plan and approved street tree list</td>
</tr>
<tr>
<td>Update the City's approved street tree list to include species that will thrive under the future climate conditions anticipated for Richmond.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

City of Richmond California Climate Action Plan 77
### Strategy RC5: Develop a Long-term Shoreline Development Vision and Protection Plan

The City will develop a comprehensive vision for its extensive shoreline that addresses climate change impacts to private property, commercial and industrial assets, public infrastructure, water quality, ecological protection, public access, public health and recreation.

<table>
<thead>
<tr>
<th>Performance Goal</th>
<th>Timeframe</th>
<th>Tracking Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop an Adaptive Management Plan that outlines an institutional framework, monitoring triggers, and a decision-making process, and creates an entity with taxing authority that would pay for infrastructure improvements necessary to adapt to higher than anticipated levels (GP Action EC6.G).</td>
<td>2018</td>
<td>Adoption of Adaptive Management Plan</td>
</tr>
</tbody>
</table>

### Strategy RC6: Support Programs and Adaptation Responses that Protect Public Health and Promote Health Equity

The City will take initial, short-term actions to reduce risk to climate change exposures and increase local preparedness efforts, including but not limited to integrating climate change into existing planning and preparedness processes to better understand the vulnerabilities of specific populations to climate change, and to target programs, capacity building, and resources in those areas in culturally- and linguistically-appropriate ways.

<table>
<thead>
<tr>
<th>Performance Goal</th>
<th>Timeframe</th>
<th>Tracking Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Update Local Hazard Mitigation Plan, General Plan Safety Element, and building codes as appropriate to incorporate public health impacts of climate change.</td>
<td>Ongoing</td>
<td>Adoption of updated plans and building codes</td>
</tr>
</tbody>
</table>
IMPLEMENTATION AND MONITORING

5.1 Overview
For Richmond to advance toward meeting its CAP Goals and Objectives, the CAP strategies and actions must be implemented in a timely and efficient manner. The City will monitor each strategy to assess whether performance objectives are being met, and to inform what adjustments may be needed to keep performance on track. This chapter describes who is responsible for implementing the CAP strategies; how funding opportunities will be used to implement the strategies; and which metrics will be used for monitoring.

5.2 Responsibility and Outreach Channels
Successful implementation of the CAP strategies will require commitment and coordination from staff throughout the City. The City Manager will work with Department Heads to assign staff members, including a new staff position of Richmond CAP Coordinator, to serve on the Richmond Sustainable Communities Team of the 5-year Business Plan to oversee the successful implementation and tracking of the CAP. The Sustainable Communities Team will directly report to the City Manager and is responsible for working within municipal departments and local entities to gather data, report on progress, track completed projects, and ensure that scheduling and funding of upcoming projects is discussed at key meetings. The Sustainable Communities Team may also advise in development review processes for new projects, determining whether development projects are consistent with the CAP.

The City is responsible for initiating the local actions to reduce emissions, but success for many measures will ultimately depend on state and regional actions as well as public participation. Community involvement is an essential component of the CAP implementation process, as many strategies depend on active participation by residents, businesses, community-based organizations (CBOs), regional organizations, or other government agencies. Coordination between Richmond City departments and these entities will be needed to ensure that existing state, regional, and community efforts are leveraged, and that CAP actions are well-managed and cost-effective.

The City will continue to use its existing community outreach channels to communicate with all sectors of the Richmond community, including traditionally underrepresented or underserved groups. The primary means of communicating news and progress regarding CAP implementation and soliciting feedback from the community and other stakeholders include:

1. Richmond Neighborhood Coordinating Councils;
2. Richmond City website (www.ci.Richmond.ca.us), and CAP website (www.RichmondClimateAction.org);
3. Email blasts including to the listservs for the Environmental Health List, City Manager Weekly Report, and Richmond City Councilmembers;
4. Regulations/discretionary review processes such as permitting, inspections, and environmental compliance (e.g., California Environmental Quality Act);
5. Utility bills, such as energy, trash, and water bills.
6. Community stakeholder outreach through collaborations with Community Based Organizations;
7. NextDoor and other online neighborhood forums;
8. Social media programs, including the City’s Facebook page and Twitter account.

5.3 Key Implementation Considerations

The majority of the CAP strategies are already being implemented to some degree, and the specific actions identified in Appendix E provide support for and/or augment existing efforts. However, the way in which the City prioritizes specific strategies and actions will depend on a variety of factors, including availability of funding and City staff time, the need for new or updated city codes and ordinances, community priorities, evolving state regulations, and changing environmental demands. For each CAP strategy, Table 5-1 summarizes the City department(s) responsible for implementation, along identified funding streams and anticipated need for code and/or policy changes.

Cost-benefit Analysis

The strategy descriptions in Appendix E assess at a high level the financial impact of program development and execution. For some strategies, detailed cost estimates or program designs will be necessary to assess the cost-effectiveness of various implementation options and to identify City budget and staffing needs. Cost-benefit analysis should be based on a variety of participation and per-unit factors, and other assumptions. As programs are developed, cost estimates should be refined and updated over time with more precise implementation-level data. Certain capital improvements, particularly those identified in the Sustainable Transportation and Land Use strategies, will need to be added to the City’s Capital Improvement Plan and/or facility master plan programs used by City Department or the implementing agency.

Implementation Responsibility

Table 5-1 identifies the City department(s) tasked with implementation of each CAP strategy. Staff from the identified department(s) will work with the Sustainable Communities Team, other Richmond City departments, local agencies, and community groups, as appropriate, to implement actions under each strategy. Responsible staffers will also monitor and measure the City’s progress in meeting its GHG reduction targets.

City Ordinance and Code Updates

As shown in Table 5-1, some strategies recommend modifications to existing codes or ordinances, while others propose new codes or ordinances. The City will review model general plan, zoning, and building code amendments and other programs, as appropriate, to develop or modify codes and ordinances. Issue areas will include, but not be limited to, those related to energy, water, land use, transportation, storm water management, building reuse, and waste reduction.

Financial Impact to the City

The strategies in Chapter 4 were formulated with an understanding that the City has finite staff and financial resources to implement CAP strategies and actions. The costs for implementation include the creation or promotion of voluntary programs, continuing administration of those programs, and coordination and outreach with other government agencies and businesses. A few strategies require up-front capital expenditures by local agencies. The City will use a combination of staff time, existing and future grant funding opportunities, direct spending, and collaboration with other agencies and organizations to achieve CAP goals. However, the City will prioritize strategies that are supported by existing funding sources, including the Chevron ECIA, GHG Reduction Fund (GGRF), grants, utility/agency incentives, and other sources. Table 5-1 identifies the major funding streams available for each strategy. Details on specific funding programs are provided in the next section.
<table>
<thead>
<tr>
<th>Strategy</th>
<th>Responsible Department(s)</th>
<th>Code or Policy Change</th>
<th>Funding Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE1</td>
<td>City Manager’s Office, Housing and Community Development</td>
<td></td>
<td>City Manager’s Office, Planning and Building Services</td>
</tr>
<tr>
<td>EE2</td>
<td>City Manager’s Office, Housing and Community Development</td>
<td></td>
<td>City Manager’s Office, Planning and Building Services</td>
</tr>
<tr>
<td>EE3</td>
<td>City Manager’s Office, Planning and Building Services</td>
<td></td>
<td>City Manager’s Office, Planning and Building Services</td>
</tr>
<tr>
<td>EE4</td>
<td>City Manager’s Office, Planning and Building Services</td>
<td></td>
<td>City Manager’s Office, Planning and Building Services</td>
</tr>
<tr>
<td>RE1</td>
<td>City Manager’s Office, Planning and Building Services</td>
<td></td>
<td>City Manager’s Office, Planning and Building Services</td>
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<tr>
<td>RE2</td>
<td>City Manager’s Office, Planning and Building Services</td>
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<td>City Manager’s Office, Planning and Building Services</td>
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<tr>
<td>RE3</td>
<td>City Manager’s Office, Planning and Building Services</td>
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<td>City Manager’s Office, Planning and Building Services</td>
</tr>
<tr>
<td>TL1</td>
<td>City Manager’s Office, Planning and Building Services</td>
<td></td>
<td>City Manager’s Office, Planning and Building Services</td>
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<tr>
<td>TL2</td>
<td>City Manager’s Office, Planning and Building Services</td>
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<td>City Manager’s Office, Planning and Building Services</td>
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</tbody>
</table>

Table 5.1: CAP Strategy Implementation: Responsible Departments, Funding Sources, and Code/Policy Changes
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</tr>
</thead>
<tbody>
<tr>
<td>TL3</td>
<td>Improve Bicycle and Pedestrian Infrastructure</td>
<td>City Manager’s Office, Planning and Building Services, Transportation and Transit Services</td>
<td>GHG Reduction Fund, Grants, Utility/Agency Incentives</td>
<td></td>
</tr>
<tr>
<td>TL4</td>
<td>Improve Signal Timing</td>
<td>City Manager’s Office, Transportation and Transit Services</td>
<td></td>
<td></td>
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<tr>
<td>TL5</td>
<td>Expand Public Transit Options and Improve Multi-Modal Network Connectivity</td>
<td>Public Works, Transportation and Transit Services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TL6</td>
<td>Promote Car Sharing, Bike Sharing, and Ride Sharing</td>
<td>City Manager’s Office, Transportation and Transit Services</td>
<td></td>
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<tr>
<td>TL7</td>
<td>Promote Low-Carbon Vehicles and Fuels</td>
<td>City Manager’s Office, Transportation and Transit Services</td>
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<tr>
<td>TL8</td>
<td>Outreach and Education to Support Public Transit and Active Transportation</td>
<td>City Manager’s Office, Transportation and Transit Services</td>
<td></td>
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</tr>
<tr>
<td>TL9</td>
<td>Support Transportation Demand Management</td>
<td>City Manager’s Office, Transportation and Transit Services</td>
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<td></td>
</tr>
<tr>
<td>SW1</td>
<td>Establish a Zero Waste Framework</td>
<td>City Manager’s Office, Planning and Building Services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SW2</td>
<td>Leverage Existing Programs and Incentives</td>
<td>City Manager’s Office, Planning and Building Services</td>
<td></td>
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</tbody>
</table>
### Table 5-1: CAP Strategy Implementation: Responsible Departments, Funding Sources, and Code/Policy Changes

<table>
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<th>Strategy</th>
<th>Title</th>
<th>Responsible Department(s)</th>
<th>Funding Sources</th>
<th>Code or Policy Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW3</td>
<td>Support Waste Collection Services, Rates and Schedules that Maximize Participation in Composting and Recycling Programs</td>
<td>City Manager’s Office</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SW4</td>
<td>Increase Diversion of Construction and Demolition (C&amp;D) Waste</td>
<td>City Manager’s Office; Building and Planning Services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SW5</td>
<td>Promote School Waste Diversion Programs</td>
<td>City Manager’s Office</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WA1</td>
<td>Promote EBMUD Outreach and Conservation Programs</td>
<td>City Manager’s Office</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WA2</td>
<td>Expand School Programs</td>
<td>City Manager’s Office</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WA3</td>
<td>Green Building Strategies for Water Conservation</td>
<td>City Manager’s Office, Planning and Building Services, Utilities Department</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WA4</td>
<td>Support Water Infrastructure Improvements and Expand Water Reuse and Recycling</td>
<td>City Manager’s Office</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GA1</td>
<td>Support Urban Tree-Planting Programs</td>
<td>Public Works, Planning and Building Services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GA2</td>
<td>Support Local Agriculture and Food Production</td>
<td>Public Works, Planning and Building Services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategy</td>
<td>Title</td>
<td>Responsible Department(s)</td>
<td>Funding Sources</td>
<td>Code or Policy Change</td>
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</tr>
<tr>
<td>GA3</td>
<td>Support Green Infrastructure and Streetscape Design</td>
<td>City Manager’s Office, Planning and Building Services, Utilities Department</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GB1</td>
<td>Reduce Industrial Carbon Emissions</td>
<td>City Manager’s Office, Planning and Building Services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GB2</td>
<td>Green Workforce Development</td>
<td>Department of Employment and Training</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GB3</td>
<td>Support Green/Clean Technology Incubator Programs</td>
<td>City Manager’s Office</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GB4</td>
<td>Outreach and Incentives to Support Local Participation in Energy Efficiency Technical Assistance and Green Business Programs</td>
<td>City Manager’s Office</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GB5</td>
<td>Reduce Emissions from Goods Movement</td>
<td>City Manager’s Office, Port Operations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GB6</td>
<td>Reduce Use of Short-Lived Climate Pollutants (SLCPs)</td>
<td>City Manager’s Office</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RC1</td>
<td>Improve Community Preparedness for Climate Emergencies</td>
<td>City Manager’s Office, Police and Fire Departments</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 5-1: CAP Strategy Implementation: Responsible Departments, Funding Sources, and Code/Policy Changes

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<th>Funding Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>RC2</td>
<td>Increase Resilience of Local Housing to Climate Change</td>
<td>City Manager’s Office, Housing and Community Development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RC3</td>
<td>Increase Resilience of Critical Infrastructure to Climate Change</td>
<td>City Manager’s Office, Department of Public Works, Utilities Department</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RC4</td>
<td>Increase Resilience of Parks and Ecosystems to Climate Change</td>
<td>Department of Public Works, Recreation Department</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RC5</td>
<td>Develop a Long-term Shoreline Vision and Protection Plan</td>
<td>Planning and Building Services, Department of Public Works</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RC6</td>
<td>Protect Public Health and Promote Health Equity</td>
<td>City Manager’s Office, Richmond Emergency Services</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.4 Tracking Performance and Co-benefits

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

Many of the CAP’s GHG reduction strategies have the added benefit of improving Richmond’s urban environment and creating greater health equity among City residents. CAP strategies may also create new social and economic opportunities for Richmond residents. For example, some strategies will improve public health outcomes by encouraging walking and biking or reducing air pollution; others offer economic benefits such as job creation, or financial benefits such as energy retrofits that lower utility bills.

Monitoring Progress toward CAP Targets

Regular monitoring provides concrete data to document the City’s progress in reducing GHG emissions to reach its 2020 and 2030 reduction targets. The Richmond CAP Coordinator will present an annual memorandum or report card to the City Manager summarizing progress implementation of CAP measures. The report will evaluate the successes and challenges in meeting the City’s GHG reduction targets (as they become known or apparent), provide the status of implementing actions for each reduction strategy in the CAP (e.g., initiated, ongoing, completed), assess the effectiveness of each strategy, and recommend adjustments to programs or actions as needed. The annual report will also assess whether the City’s actual growth and development is consistent with the forecasts and assumptions in the CAP. The annual report will be presented to City Council, Planning Commission, and other stakeholders as needed.

GHG Inventory Updates

An update of the City’s GHG inventory will be completed biennially (every other year) at minimum. If appropriate, the City shall modify the geographic scope of the inventory, along with emissions baseline and targets as necessary. Inventory updates will encompass all inventory sectors (residential energy, commercial/industrial/municipal energy, large industrial energy, on- and off-road transportation, solid waste, wastewater, and water), and include a comparison to baseline GHG emissions (2005) and analysis of trends over time.

CAP Revisions

A comprehensive revision of the CAP should occur at least every five years to monitor progress of GHG reductions against the 2020 and 2030 targets, to account for the impact of new legislation and state programs on GHG targets and emissions reductions, and to adjust strategies and actions as needed to reach the targets. With the California Governor’s recent Executive Order B-30-15 to cut state-wide GHG emissions to 40 percent below 1990 levels by 2030, it is widely expected that the state will soon codify post-2020 GHG reduction targets and enact new laws and programs to ensure those targets are met. Targeted investment and state supported infrastructure will be needed to establish commercial markets for low-carbon solutions to grow to the scale required. These developments will greatly enhance the ability of the City of Richmond to meet its long-term GHG reduction goals.

Tracking Implementation of Local Measures

City staff will report CAP implementation progress using tracking metrics that serve to gauge degree of implementation and associated GHG reductions. Table 5-2 lists the tracking metrics used to estimate the GHG reduction impacts of each CAP strategy, which consists of a mix of system level metrics (e.g., energy usage by community), program level metrics (e.g., percent of homes and businesses participating in Marin Clean Energy), and milestones/status metrics (e.g., compliance with Title 24 regulations). Each metric serves multiple functions, such as:
• Indicates whether the City is on path to achieve the goals set in the CAP, including GHG reduction as well as improvements in overall health outcomes, health equity, local jobs, cost savings, community resilience and other important co-benefits attributed to CAP implementation;
• Measures the effectiveness of individual CAP strategies in achieving their objectives;
• Supports CAP monitoring and public reporting needs including the ability to be easily tracked over time;
• Supports the pursuit of grants for CAP implementation, and grant reporting;

• Relies on accessible, high quality data;
• Is easily understood by the public and other stakeholders;
• Is consistent with and supports existing plans, policies, and strategies such as the Richmond General Plan, Richmond Livable Corridors Sustainability Guidelines, and the Health in All Policies (HiAP) Strategy and ordinance.

Table 5-2 also describes the data sources for the tracking metrics, and the scale at which data will be tracked. A monitoring tool is being developed by the City to track implementation milestones and to annually estimate the GHG reductions associated with implementation.

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Title</th>
<th>GHG Reduction Tracking Metrics</th>
<th>Data Source(s)</th>
<th>Scale</th>
</tr>
</thead>
</table>
| EE1      | Leverage Energy Utility Programs, Rebates, and Incentives to Improve Efficiency of Existing Buildings | Electricity and natural gas use (total and per capita)  
Number of buildings retrofitted | PG&E, MCE | City, Sector |
| EE2      | Leverage Other (Non-Utility) Third-Party Programs and Financing Sources to Improve Efficiency of Existing Buildings | Electricity and natural gas use (total and per capita)  
Number of buildings retrofitted | PACE programs, East Bay Energy Watch | City, Sector |
| EE3      | Promote Innovative Design and Enforce Green Building Codes | Square footage of new construction meeting/exceeding Title 24  
Square footage of new construction achieving ZNE | PG&E, MCE, City permit data | City, Sector |
| EE4      | Outreach and Education to Promote Energy Conservation and Renewable Energy | City energy outreach budget  
Program participation rates | City data | City |
| RE1      | Increase Local Solar Energy Generation | Number of homes and businesses solarized  
Total local solar generation capacity, quantity installed per year | CA Solar Initiatives, PG&E, City permit data | City |
## Table 5-2: CAP Performance Tracking Metrics

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Title</th>
<th>GHG Reduction Tracking Metrics</th>
<th>Data Source(s)</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>RE2</td>
<td>Promote and Maximize Utility Clean Energy Offerings</td>
<td>Enrollment in MCE Green Energy programs</td>
<td>MCE, PG&amp;E</td>
<td>City</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Average CO2e content of PG&amp;E and MCE electricity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RE3</td>
<td>Support Fuel Switching and Electrification to Reduce Carbon Emissions</td>
<td>Number of natural gas systems electrified</td>
<td>PG&amp;E, CEC</td>
<td>City</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Therms reduced by electrification per year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TL1</td>
<td>Promote Smart Growth and Complete Neighborhoods</td>
<td>Percent density increase in PDAs and citywide</td>
<td>City planning data on residential and employment density</td>
<td>Neighborhood, zip code, City</td>
</tr>
<tr>
<td>TL2</td>
<td>Complete Streets</td>
<td>Percent of total intersections and roadways retrofitted</td>
<td>City planning data</td>
<td>Neighborhood, zip code, City</td>
</tr>
<tr>
<td>TL3</td>
<td>Improve Bicycle and Pedestrian Infrastructure</td>
<td>Percent of Master Plan improvements completed</td>
<td>City planning data</td>
<td>Neighborhood, zip code, City</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Percent increase in bicycle trips (commute and non-commute)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TL4</td>
<td>Improve Signal Timing</td>
<td>Percentage of total signals coordinated</td>
<td>City planning data</td>
<td>Neighborhood, zip code, City</td>
</tr>
<tr>
<td>TL5</td>
<td>Expand Public Transit Options and Improve Multi-Modal Network Connectivity</td>
<td>Transit ridership rates</td>
<td>AC Transit, City planning data</td>
<td>Neighborhood, zip code, City; Bus line/stop</td>
</tr>
<tr>
<td>TL6</td>
<td>Promote Car Sharing, Bike Sharing, and Ride Sharing</td>
<td>Percent of residents within half-mile of bike share station and/or car sharing pod</td>
<td>City permit data, Assessor data, Car-share / bike-share websites</td>
<td>Point data, City</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Program participation rates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TL7</td>
<td>Promote Low-Carbon Vehicles and Fuels</td>
<td>ZEV vehicle penetration (percent of total fleet)</td>
<td>City permit data</td>
<td>City</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Number of ZEV stations installed</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Table 5-2: CAP Performance Tracking Metrics

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Title</th>
<th>GHG Reduction Tracking Metrics</th>
<th>Data Source(s)</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>TL8</td>
<td>Outreach and Education to Support Public Transit and Active Transportation</td>
<td>Number of residents who report using transit or active transportation</td>
<td>American Community Survey, Richmond's National Citizen Survey</td>
<td>Neighborhood, zip code, City</td>
</tr>
<tr>
<td>TL9</td>
<td>Support Transportation Demand Management</td>
<td>Percent participation in TDM programs</td>
<td>Richmond's National Citizen Survey, WCCUSD</td>
<td>Neighborhood, zip code, City</td>
</tr>
<tr>
<td>SW1</td>
<td>Establish a Zero Waste Framework</td>
<td>Citywide solid waste generation</td>
<td>City data, City hauler, Recyclemore</td>
<td>City</td>
</tr>
<tr>
<td>SW2</td>
<td>Increase Participation in Recycling Programs and Incentives</td>
<td>Annual tonnages of recyclables and organics diverted from landfill</td>
<td>City hauler, Recyclemore</td>
<td>City</td>
</tr>
<tr>
<td>SW3</td>
<td>Support Waste Collection Services, Rates and Schedules that Maximize Participation in Composting and Recycling Programs</td>
<td>Citywide solid waste generation</td>
<td>City hauler, Recyclemore</td>
<td>City</td>
</tr>
<tr>
<td>SW4</td>
<td>Increase Diversion of Construction and Demolition (C&amp;D) Waste</td>
<td>Annual tonnage of processed (recycled) C&amp;D materials</td>
<td>City hauler, Recyclemore</td>
<td>City</td>
</tr>
<tr>
<td>SW5</td>
<td>Promote School Waste Diversion Programs</td>
<td>Percentage of Richmond schools with “three-bin” recycling programs</td>
<td>WCCUSD</td>
<td>City</td>
</tr>
<tr>
<td>WA1</td>
<td>Promote EBMUD Outreach and Conservation Programs</td>
<td>Gallons saved per year</td>
<td>EBMUD</td>
<td>City</td>
</tr>
<tr>
<td>WA2</td>
<td>Expand School Programs</td>
<td>Percent of schools participating in EBMUD programs</td>
<td>EBMUD, WCCUSD</td>
<td>City</td>
</tr>
<tr>
<td>WA3</td>
<td>Green Building Strategies for Water Conservation</td>
<td>CalGREEN compliance</td>
<td>City permit data</td>
<td>City</td>
</tr>
</tbody>
</table>
## Implementation and Monitoring

### Table 5-2: CAP Performance Tracking Metrics

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Title</th>
<th>GHG Reduction Tracking Metrics</th>
<th>Data Source(s)</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>WA4</td>
<td>Support Water Infrastructure Improvements and Expand Water Reuse and Recycling</td>
<td>Number of graywater and rainwater catchment permits issued</td>
<td>City permit data</td>
<td>City</td>
</tr>
<tr>
<td>GA1</td>
<td>Support Urban Tree-Planting Programs</td>
<td>Annual trees planted by residents</td>
<td>City data, CBO data</td>
<td>City</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Number of homes and businesses participating in tree-planting programs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GA2</td>
<td>Support Local Agriculture and Food Production</td>
<td>Number of urban and school gardens</td>
<td>City permit data, assessor data</td>
<td>City</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Acreage of urban gardens</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Number of weekly farmer’s markets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GA3</td>
<td>Support Green Infrastructure and Streetscape Design</td>
<td>Number of green infrastructure projects completed annually</td>
<td>City permit data</td>
<td>N/A</td>
</tr>
<tr>
<td>GB1</td>
<td>Reduce Industrial Carbon Emissions</td>
<td>GHG reductions by local regulated (capped) facilities</td>
<td>CARB</td>
<td>City</td>
</tr>
<tr>
<td>GB2</td>
<td>Workforce Development</td>
<td>Number of individuals trained, total training hours by discipline or program</td>
<td></td>
<td>City, industry sector</td>
</tr>
<tr>
<td>GB3</td>
<td>Support Green/Clean Technology Incubator Programs</td>
<td>Number of businesses locating in Richmond and enrolling in support programs</td>
<td>Richmond Office of Economic Development</td>
<td>City, industry sector</td>
</tr>
<tr>
<td>GB4</td>
<td>Outreach and Incentives to Support Local Participation in Energy Efficiency Technical Assistance and Green Business Programs</td>
<td>Number of local businesses participating in local Green Business Program</td>
<td>Richmond Office of Economic Development</td>
<td>City</td>
</tr>
<tr>
<td>GB5</td>
<td>Reduce Emissions from Goods Movement</td>
<td>Port's MTC02e emissions reduced below 2005 baseline</td>
<td>Port of Richmond, CARB</td>
<td>City</td>
</tr>
<tr>
<td>GB6</td>
<td>Reduce Use of Short-Lived Climate Pollutants (SLCPs)</td>
<td>TBD</td>
<td>BAAQMD, CARB</td>
<td>City</td>
</tr>
<tr>
<td>RC1</td>
<td>Increase Local Awareness of Climate Change Hazards</td>
<td>Adoption of updated plans and building codes</td>
<td></td>
<td>City</td>
</tr>
</tbody>
</table>
Table 5-2: CAP Performance Tracking Metrics

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Title</th>
<th>GHG Reduction Tracking Metrics</th>
<th>Data Source(s)</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>RC2</td>
<td>Increase Resilience of Local Housing &amp; Infrastructure to Climate Change</td>
<td>Adoption of updated plans and building codes</td>
<td>City</td>
<td>City</td>
</tr>
<tr>
<td>RC3</td>
<td>Improve Community Preparedness for Climate Emergencies</td>
<td>Adoption of updated plans and building codes</td>
<td>City</td>
<td>City</td>
</tr>
<tr>
<td>RC4</td>
<td>Increase Resilience of Parks and Ecosystems to Climate Change</td>
<td>Adoption of updated parks Plan and approved street tree list</td>
<td>City</td>
<td>City</td>
</tr>
<tr>
<td>RC5</td>
<td>Develop Long-term Plan for Sea Level Rise with a Comprehensive Shoreline Vision</td>
<td>Adoption of Adaptive Management Plan</td>
<td>City</td>
<td>City</td>
</tr>
<tr>
<td>RC6</td>
<td>Support Programs to Protect Public Health and Health Equity</td>
<td>Adoption of updated plans and building codes</td>
<td>City</td>
<td>City</td>
</tr>
</tbody>
</table>

Tracking Progress of State and Regional Measures

While successful implementation of the CAP relies to a large extent on local actions, the City is ultimately dependent on state and regional programs to close the gap between projected business-as-usual (BAU) emissions and its reduction goals. Close monitoring of the real gains being achieved by state programs will inform the City whether adjustments to locally implemented measures are needed in order to achieve GHG reduction targets. The City will work with regional agencies and organizations to track the success of actions included in the Richmond CAP that are being led by, or are heavily influenced by, state and regional efforts, such as advances in Title 24 Energy Efficiency Standards, the state’s Advanced Clean Vehicle standards, the Low Carbon Fuel Standard, and goods movement programs.

Tracking Health Equity and Resilience

The effects of CAP implementation on health equity and resilience will be tracked using the indicators shown in Figure 5-1. These indicators were selected based on their correlation with GHG emissions reductions, community resilience improvements, and other co-benefit outcomes expected with implementing the strategies and actions in the CAP. For example, CAP strategies to improve pedestrian and bicycle infrastructure may increase physical activity, reduce collisions with cyclists and pedestrians, and reduce rates of mortality for certain diseases. These indicators can be used to track health outcomes and guide policy and programmatic initiatives that are consistent with, or linked to, existing health indicators projects in the City of Richmond, such as the Health and Wellness Element and the City’s Health in All Policies document. Linking health indicators to the implementation of CAP strategies can provide supporting information for grant applications and other opportunities that fund health initiatives at a range of scales.
Some indicators, such as Air Quality, are highly correlated with CAP actions (e.g., transit oriented development to reduce vehicle trips) and with health outcomes (fewer vehicle trips produce fewer emissions of criteria air pollutants and GHG emissions). Other indicators, such as physical activity, obesity, and collision data, are affected by CAP measures that influence land use and transportation such as complete streets, or improvements to pedestrian and bicycle infrastructure.  

Table 5-3 describes the metrics underlying each health equity and resilience indicator and the data source(s) used for quantification. As indicated in Table 5-1, eight of the ten metrics are already being tracked by the City as part of HiAP implementation. For most metrics, data is available at multiple scales (e.g., County, City, zip code, census tract). Even with high resolution data, however, it is difficult to attribute specific health outcomes or resiliency trends to individual GHG reduction strategies since many implementing actions are occurring simultaneously, and because of the complex interplay of so many social and environmental factors not related to CAP implementation. Accordingly, the indicators are most relevant to overall CAP implementation and how it is affecting health equity and resilience across the community. Even so, normalizing performance metrics against a second variable, such as population, service population (jobs + residents), or a particular demographic or economic sector, can provide additional insights into program effectiveness. For example, normalizing per capita electricity use against income and/or race can evaluate how well energy efficiency programs are helping different socio-economic groups.

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3. California Department of Public Health, Climate Action for Health: Integrating Public Health into Climate Action Planning, February 2012. Available at: [https://www.cdph.ca.gov/programs/Pages/ClimateChange.aspx](https://www.cdph.ca.gov/programs/Pages/ClimateChange.aspx)
### Table 5-3: Health Equity and Resilience Indicators and Metrics for City of Richmond Climate Action Plan

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Metric</th>
<th>Source</th>
<th>Data Scale</th>
<th>HiAP Strategy Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Quality</td>
<td>Ozone, PM 2.5, and NOx Concentrations; diesel PM Emissions&lt;br&gt;Self-reported air quality</td>
<td>CalEnviroScreen, ARB, BAAQMD, Richmond’s National Citizen Survey (NCS)</td>
<td>County, City, census tract</td>
<td></td>
</tr>
<tr>
<td>Adult physical activity</td>
<td>Percentage of adults who meet federal physical activity guidelines</td>
<td>California Health Interview Survey (CHIS)</td>
<td>County, City, zip code</td>
<td></td>
</tr>
<tr>
<td>Asthma diagnosed in children</td>
<td>Percentage of children diagnosed with asthma</td>
<td>(CHIS)</td>
<td>County, City, zip code</td>
<td></td>
</tr>
<tr>
<td>Asthma hospitalizations</td>
<td>Hospitalization rate for patients where asthma was the condition established to be the chief cause of the admission of the patient to the facility for care, per 100,000 people</td>
<td>California Office of Statewide Health Planning and Development (OSHPD)</td>
<td>County, City, zip code</td>
<td></td>
</tr>
<tr>
<td>Collisions with pedestrians and cyclists</td>
<td>Rate (and total number) of motor vehicle collisions with pedestrians and cyclists per 10,000</td>
<td>California Highway Patrol Statewide Integrated Traffic Records System</td>
<td>Point data, City, zip code, tract</td>
<td></td>
</tr>
<tr>
<td>Health status (self-reported)</td>
<td>Reported as excellent, good, fair or poor</td>
<td>Richmond’s NCS</td>
<td>City</td>
<td></td>
</tr>
<tr>
<td>Heat related illness</td>
<td>Emergency Department visits for heat stress</td>
<td>California Department of Public Health (DPH)</td>
<td>City</td>
<td></td>
</tr>
<tr>
<td>Human Development Index</td>
<td>California Human Development Index is comprised of four indicators: life expectancy, school enrollment, educational degree attainment, and median personal earnings</td>
<td>Measure of America</td>
<td>County, City, neighborhood</td>
<td></td>
</tr>
<tr>
<td>Low birth weight babies</td>
<td>Percent of births below 2,500 grams (5 lbs 8 oz.)</td>
<td>CalEnviroScreen, California DPH</td>
<td>County, zip code, census tract</td>
<td></td>
</tr>
<tr>
<td>Overweight and obesity rates – adult</td>
<td>Percentage of adult population that is overweight or obese (Body Mass Index)</td>
<td>CHIS</td>
<td>County, City, zip code</td>
<td></td>
</tr>
</tbody>
</table>
5.5 Aligning with Funding Opportunities

A number of existing and anticipated funding opportunities will be leveraged to implement the Richmond CAP strategies. The primary funding sources referenced in Table 5-1 and in Appendix E are described below.

1. **Chevron Refinery Modernization Project Environmental and Community Investment Agreement (ECIA).** On July 29, 2014 the Richmond City Council approved the Environmental and Community Investment Agreement (ECIA) as part of the Chevron Modernization Project. The ECIA will provide $90 million dollars to the Richmond community over a period of ten years. Committed uses of these funds include investments in community-based GHG reduction programs, and a photovoltaic solar farm, a community scholarship program, public safety, job-training, and competitive community grants.

2. **Greenhouse Gas Reduction Fund (GGRF).** Funds generated by California’s cap-and-trade program are deposited into the State’s Greenhouse Gas Reduction Fund (GGRF). The GGRF is created by the California Global Warming Solutions Act of 2006 (AB 32), which designates the Cap-and-Trade program as one of several strategies that California uses to reduce GHG emissions that cause climate change. The funds are administered by State and local agencies to further the goals and actions outlined in the Scoping Plan and other State climate and energy plans, through a variety of GHG reducing programs for energy efficiency, public transit, low-carbon transportation and affordable housing. Short-Lived Climate Pollutants (SLCPs) including methane, black carbon (soot) and fluorinated gases are also targeted for reductions. Per the requirements of Senate Bill 535 (2012, De León) a quarter of the proceeds from the GGRF must also go to projects that provide a benefit to disadvantaged communities. A large portion of the City of Richmond is classified as a disadvantaged community and is eligible for this funding (see Figure 2.3 in Chapter 2, Opportunities and Challenges). The Draft Cap-and-Trade Second Investment Plan for fiscal years 2016/17 and 2017/18 recommends that a portion of the total GGRF proceeds be allocated to “integrated projects” that support energy and transportation solutions, smart growth, urban forestry, and more funding for disadvantaged communities. GGRF funding streams that are important to CAP implementation include the following:

a. The State’s **Affordable Housing and Sustainable Communities (AHSC) Program** is designed to distribute GGRF funds to disadvantaged communities. Eligible projects for AHSC funding include those providing affordable housing, transit-oriented development (TOD), transit, complete streets, and active transportation projects that reduce GHG emissions and vehicle miles travelled (VMT). Project scoring criteria consider the

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4 CARB’s Draft Second Investment Plan available: [http://www.arb.ca.gov/cc/capandtrade/auctionproceeds/auctionproceeds.htm](http://www.arb.ca.gov/cc/capandtrade/auctionproceeds/auctionproceeds.htm)
anticipated economic, environmental, and public health benefits. Approximately $320 million dollars was available through the AHSC program for fiscal year 2015-16 funding.

b. The GGRF contributes to the CalFire Urban and Community Forestry Program. The Program supports a number of urban tree planting projects, including jurisdiction wide tree inventory and urban forest mapping, analysis, and long term management planning; urban wood and biomass utilization projects; projects to assist local entities purchase and improve unused lots; and projects for urban green infrastructure.

c. The GGRF supports energy efficiency and renewable energy projects for single and multifamily low-income housing units within disadvantaged communities, supplementing the federal Low-Income Weatherization Assistance Program administered by the California Community Services and Development (CSD) department. The City has successfully leveraged the low-income solar program to solarize a number of households in Richmond and plans to solarize an additional 130 homes from 2015 through 2018.

d. CARB’s Low Carbon Transportation program supports the transition to low carbon freight and passenger transportation and prioritizes funding disadvantaged communities. This investment from the GGRF will also support the Brown Administration’s goal to deploy 1.5 million zero emission vehicles in California by 2025. CARB currently administers programs that provide rebates for zero emission cars and vouchers for hybrid and zero emission trucks and buses. Incentives will also be provided for the pre commercial demonstration of advanced freight technology to move cargo in California, which will benefit communities near freight hubs. The Clean Vehicle Rebate Project is designed to promote the purchase of battery electric, plug-in hybrid electric, and fuel cell vehicles. Rebates of up to $5,000 per light-duty vehicle are available for individuals, nonprofits, government entities, and business owners who purchase or lease an eligible vehicle. BAAQMD administers the Clean Vehicle Rebate Project for the Bay Area.

e. With GGRF funding, CalRecycle established the GHG Reduction Grant and Loan Program to provide financial incentives for capital investments in composting/digestion infrastructure and recycling manufacturing facilities that will result in reduced GHG emissions.

3. One Bay Area Grant (OBAG) Program. The OBAG program supports implementation of Plan Bay Area, providing discretionary funds for many transit-oriented housing projects and transportation infrastructure improvements in PDAs, such as safe bicycle lanes and more pedestrian-friendly sidewalks. OBAG established program commitments and policies for investing roughly $800 million over a four-year period (fiscal years 2012-13 through 2015-16), funded by federal funds authorized by Congress in Moving Ahead for Progress in the 21st Century (MAP 21).

4. CalTrans Grant Programs: The California Department of Transportation (CalTrans) administers several grant programs available to the City that benefit sustainable transportation systems:

a. Strategic Partnerships Grants fund planning projects that encourage regional agencies to partner with Caltrans to identify and address statewide/interregional transportation deficiencies in the state highway system; strengthen government-to-government relationships; and, result in programmed system improvements. An estimated $1.5 million will be available for the FY 2016-2017 grant cycle. The program requires a 20% non-federal local match. Grants are available in amounts ranging from a minimum of $100,000 to a maximum of $500,000. CAP-relevant example eligible projects include corridor studies, transportation demand management plans, and system investment prioritization plans.
b. **Sustainable Communities Grants** fund transportation planning projects that identify and address mobility deficiencies in the multimodal transportation system. Eligible projects are those that identify specific mobility needs of disadvantaged communities, encourage stakeholder collaboration, involve active public engagement, integrate Smart Mobility concepts, and ultimately result in programmed system improvements. The program’s overarching objectives include sustainability, preservation, mobility, safety, innovation, economic development, health, and equity. Eligible projects include community efforts to reduce transportation-related GHG emissions.

5. **Bay Area Air Quality Management District (BAAQMD)** administers several grant programs for public agencies, private businesses, and Bay Area residents that help reduce pollutants and greenhouse gases from mobile sources. Over $13 million is available for all electric vehicle (EV)-related programs for the fiscal year ending in 2016, distributed through a number of programs, including:

   a. **Shuttle and Rideshare Program**: Aims to reduce air pollution in the Bay Area by funding existing shuttle/feeder bus services and regional rideshare projects. Funding is awarded on a competitive basis.

   b. **Transportation Fund for Clean Air (TFCA)**: Funds are available for bicycle facility and infrastructure projects including secure bicycle parking, bike racks, bike paths and bikeways.

   c. Funding to support plug-in electric vehicle (PEV) infrastructure and adoption, including the **Plug-in Electric Vehicle Rebate Program** for residents, businesses, and public agencies, and the **Charge! Program** for the installation of PEV charging stations at Bay Area transportation corridors, workplaces, multi-family dwelling units and trip destination locations.

   d. **Light-Duty Zero- and Partial-Zero-Emissions Vehicle Program**: Grant funding is available for plug-in hybrid-electric, plug-in electric, and fuel cell vehicles certified by the CARB as meeting super-ultra low emission vehicle (SULEV) or zero-emission vehicle (ZEV) standard. Eligible recipients include all public and private entities within the boundaries of the District.

   e. **Heavy Duty Electric Vehicle (EV) Program**: Grant funding is available for zero- and partial-zero-emissions medium, heavy-duty vehicles and Urban Buses in fleets. Eligible vehicle types include zero-emissions (electric and fuel cell technologies) vehicles that are certified by the CARB. Eligible recipients include all public and private entities within the boundaries of the District.

   f. **Goods Movement Emission Reduction Program**: Grant funding is available from this CARB program for local public agencies and equipment owners involved in the movement of freight.

6. **Prop 39 Grants**: The California Clean Energy Jobs Act (Proposition 39) funds eligible local educational agencies — including county offices of education, school districts, charter schools and state special schools — for energy efficiency and clean energy projects. It also funds related energy planning, energy training, energy management, and energy projects with related non-energy benefits. The Proposition 39 award program is scheduled to continue through fiscal year 2017/18. Up to $550 million annually is available for appropriation by the Legislature for eligible projects in K-12 schools.
7. **Energy and Water provider programs:** A wide variety of financial incentives and assistance programs are offered to customers of the energy and water utilities (PG&E and EBMUD) and the Community Choice Aggregation entity (MCE) serving the City of Richmond. Programs to promote energy efficiency, water conservation, and clean energy projects include rebates, retrofit incentives, on-bill financing, free audits, and design assistance, some of which are targeted to low-income customers. These include ratepayer-funded energy efficiency programs that are administered by PG&E and MCE within a framework developed by the CPUC.

8. **The Partnership for Sustainable Communities:** This multiagency partnership between U.S. Department of Housing and Urban Development (HUD), U.S. Department of Transportation (DOT), and the U.S. Environmental Protection Agency (USEPA) offers grant funding to help communities realize their own visions for building more livable, walkable, and environmentally sustainable regions.

9. **Proposition 1 grants:** The Water Quality, Supply, and Infrastructure Improvement Act of 2014 (Proposition 1) authorizes $7.5 billion in general obligation bonds to fund ecosystems and watershed protection and restoration, water supply infrastructure projects, including surface and groundwater storage, and drinking water protection. $725 million is aimed at water recycling and reuse. Proposition 1 allocates funding to various state and regional agencies to administer grant programs that emphasize a shift to an integrated water management approach that relies on green infrastructure at the local level. These include:

   a. $100.5 million to the State Coastal Conservancy for competitive grants for multi-benefit ecosystem and watershed protection and restoration projects. The Conservancy expects to grant approximately $10 million each year for about ten years.

   b. $200 million to the State Water Resources Control Board for stormwater and green infrastructure projects.

10. **The California Endowment** supports healthy, livable communities through grants and other assistance that enable local governments to take a “health in all policies” approach to land use planning, as well as building sidewalks, bike paths, and utilizing other parts of the “built environment” to promote physical activity. Richmond is part of The California Endowment’s Building Healthy Communities (BHC) program, a ten-year, comprehensive community initiative that is creating a revolution in the way Californians think about and support health in their communities. Known as Healthy Richmond, the City’s BHC site is home to over 46,000 residents living in Central, Southern, and North Richmond neighborhoods. Residents and partners in Healthy Richmond are driving change across many systems and issues, including healthcare for all; safe homes and communities; vibrant, healthy schools and neighborhoods; and healthy economic revitalization.⁵

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⁵ More information on Healthy Richmond available at: [http://healthyrichmond.net/about/mission-vision-history/](http://healthyrichmond.net/about/mission-vision-history/)