

Attachment E
Greenhouse Gas Reduction Plan Update

APPENDIX G

GREENHOUSE GAS REDUCTION PLAN UPDATE

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GREENHOUSE GAS REDUCTION PLAN UPDATE

CITY OF FRESNO, CALIFORNIA



LSA

March 2020

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GREENHOUSE GAS REDUCTION PLAN UPDATE

CITY OF FRESNO, CALIFORNIA

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EXECUTIVE SUMMARY

The City of Fresno (City) is committed to providing a livable, equitable, and economically vibrant community through the reduction of greenhouse gas (GHG) emissions. By using energy more efficiently, harnessing renewable energy to power buildings, recycling waste, and enhancing access to sustainable transportation modes, the City will keep dollars in the local economy, create jobs, and improve the community's quality of life. To that end, the City has implemented a number of sustainability and conservation efforts and seeks to continue those efforts through local planning and partnerships. This GHG Reduction Plan Update (GHG Plan Update) integrates the City's past and current efforts with its future efforts to grow and thrive sustainably.

The City adopted its first GHG Reduction Plan (GHG Plan) in December 2014.¹ The GHG Plan established a target of reducing per capita GHG emissions in the city by 21.7 percent below 2020 business-as-usual (BAU) levels by 2020 and includes GHG reduction measures designed to achieve the reduction target. The GHG Plan is considered a "Qualified Plan," according to California Environmental Quality Act (CEQA) Guidelines §15183.5.² Since adoption of the GHG Plan, two significant regulations/decisions have been established. First, on September 28, 2016, Governor Brown signed Senate Bill (SB) 32 into law that sets a Statewide goal of reducing GHG emissions to 40 percent below 1990 levels by 2030. Additionally, on November 30, 2015, the California Supreme Court published its decision on the Newhall Ranch Specific Plan invalidating the Environmental Impact Report (EIR) for a variety of reasons, including the use of 29 percent below business-as-usual (BAU) as a threshold to determine significance of GHG emissions under CEQA without any supporting evidence. The GHG Plan Update ensures conformity with the mandates of California Supreme Court in the Newhall Ranch case and the State of California's latest GHG regulations. The GHG Plan Update re-evaluates the City's GHG reduction targets and existing reduction strategies from the 2014 GHG Plan. New goals and supporting measures are proposed to reflect and ensure compliance with changes in the local and State policies and regulations such as SB 32 and California's 2017 Climate Change Scoping Plan. The City's GHG inventory, based on the most recent data available for the year 2016 is evaluated and the future growth in emissions for the BAU and adjusted BAU (ABAU) scenarios (the ABAU scenario takes into account the State policies) for the years 2020, 2030, and 2035 are projected. The 2020 and 2030 forecast years are consistent with the goals identified in Assembly Bill (AB) 32 and SB 32, which identify Statewide GHG reduction targets by 2020 and 2030. The 2035 forecast year correspond to the City's General Plan horizon year and will allow the City to develop long-term strategies to continue GHG reductions.

¹ FirstCarbon Solutions. 2014. Fresno General Plan Update, Greenhouse Gas Reduction Plan, prepared for the City of Fresno. July. Website: <https://www.fresno.gov/darm/wp-content/uploads/sites/10/2016/11/F-2-Greenhouse-Gas-Reduction-Plan.pdf> (accessed December 2019).

² CEQA Guidelines 15183.5 describes requirements of a GHG Reduction Plan that would mitigate cumulative levels of GHG emissions within a jurisdiction to a less-than-significant level and allows development project tiering from the GHG Reduction Plan.

The City’s total GHG emissions in 2016 were 2,923,633 metric tons of carbon dioxide equivalent (MT CO₂e) (Table ES-A). Under the BAU scenario, in the absence of regulations and other measures to reduce GHG emissions, the City’s BAU emissions in 2020 are estimated to be 3,092,486 MT CO₂e, or a 5.8 percent increase from 2016 emissions. By 2030, emissions are estimated to increase 19.7 percent from the 2016 level to 3,500,204 MT CO₂e. By 2035, emissions are estimated to increase 26.5 percent from the 2016 level to 3,697,738 MT CO₂e.

Table ES-A: City of Fresno 2016 Inventory Update and Business-as-Usual (BAU) Projections

Sector	2016 (MT CO ₂ e)	Percent of Total	2020 (MT CO ₂ e)	Percent of Total	2030 (MT CO ₂ e)	Percent of Total	2035 (MT CO ₂ e)	Percent of Total
Transportation	1,520,052	52	1,594,888	52	1,798,498	51	1,909,852	52
Commercial Energy	524,838	18	557,142	18	627,373	18	657,379	18
Residential Energy	479,371	16	514,053	17	579,546	17	603,951	16
Fugitive Emissions	270,130	9	288,573	9	335,316	10	357,008	10
Solid Waste	119,167	4	127,303	4	147,923	4	157,493	4
Industrial Energy	10,055	<1	10,506	<1	11,528	<1	12,035	<1
Agriculture Energy	20	<1	20	<1	20	<1	20	<1
Total	2,923,633	100	3,092,486	100	3,500,204	100	3,697,738	100

Source: City of Fresno 2016 Inventory Update (ICLEI Local Governments for Sustainability (2018). Compiled by LSA Associates, Inc. (2019).

Notes:

- Residential Energy Includes emissions from both electricity and natural gas.
- Commercial Energy includes emissions from both electricity and natural gas.
- Industrial Energy includes emissions associated with electricity.
- Agriculture Energy includes emissions associated with electricity. MT CO₂e = metric tons of carbon dioxide equivalent

Under the ABAU forecast (which represents State efforts in reducing GHG emissions within the city), emissions will be 2,132,326 MT CO₂e in 2020; 1,939,325 MT CO₂e in 2030; and 1,801,137 MT CO₂e in 2035 (Table ES-B).

Table ES-B: City of Fresno Adjusted Business-as-Usual (ABAU) Emissions

Sector	2016	2020	2030	2035
Transportation	1,520,052	1,170,329	1,131,034	1,072,955
Commercial Energy	524,838	355,121	290,950	255,226
Residential Energy	479,371	324,760	190,210	124,904
Fugitive Emissions	270,130	144,287	167,658	178,504
Solid Waste	119,167	127,303	147,923	157,493
Industrial Energy	10,055	10,506	11,528	12,035
Agriculture	20	20	20	20
Total	2,923,633	2,132,326	1,939,325	1,801,137

Source: Compiled by LSA Associates, Inc. (2019)

This GHG Plan Update assesses the previous GHG reduction targets identified in the 2014 GHG Plan and proposes new targets that are consistent with State policies. In order to bring the City of Fresno GHG Plan in-line with the State’s GHG reduction goals, emission reduction targets have been

identified as shown in Table ES-C and Figure ES-1. Based on the City’s ABAU Inventory, the City would meet the reduction target in 2020. In 2030 and 2035, the City would need to reduce emissions by 29,316 MT CO₂e and 209,463 MT CO₂e below the ABAU scenario, respectively, to meet the State-aligned target.

Table ES-C: State-Aligned GHG Emission Reduction Targets By Year

Sector	2010 ¹	2016	2020	2030	2035
BAU Emissions (MT CO ₂ e)	3,745,115	2,923,633	3,092,486	3,500,204	3,697,738
Adjusted BAU Emissions (MT CO ₂ e)	3,745,115	2,923,633	2,132,326	1,939,325	1,801,137
State-Aligned Target (Percent change from 1990)	—	—	0	-40	-50
State-Aligned Target (Percent change from 2010)	—	—	-15	-49	-58
State-Aligned Emissions Goal (MT CO ₂ e)	—	—	3,183,348	1,910,009	1,591,674
Reductions from Adjusted BAU needed to meet the State-Aligned Target (MT CO ₂ e)	—	—	Target Met	29,316	209,463

Source: Compiled by LSA Associates, Inc. (2019)

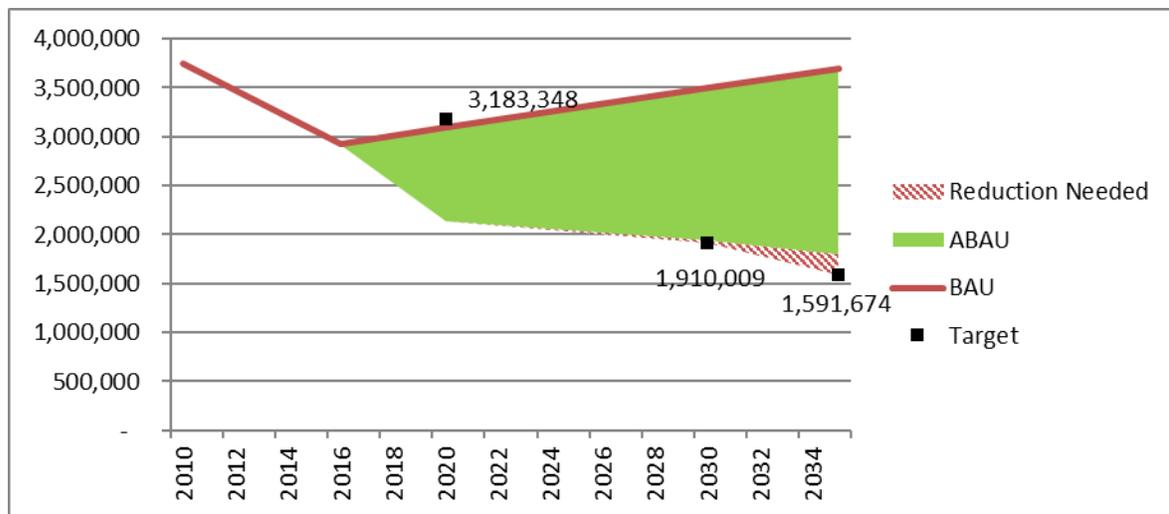
¹ Baseline (2010) emissions are from the City’s 2014 GHG Reduction Plan.

BAU = Business-as-Usual

GHG = greenhouse gas

MT CO₂e = metric tons carbon dioxide equivalent

Figure ES-1: City of Fresno GHG Emissions Inventory, Forecast, and Targets



This GHG Plan Update provides a description of General Plan policies that support a reduction in GHGs from all sources within the City’s ability to control or influence. These strategies enhance the effectiveness of State strategies by ensuring that the city is developed in ways that minimize emissions. In order to reach the long-term reduction targets, the City would also need to implement local reduction measures. These measures encourage Vehicle Miles Travel (VMT) reductions through mixed use and infill development, transportation demand management, development and penetration of electric vehicles (EVs), energy efficiency enhancement, water conservation, and

increased waste diversion. Public education and outreach would play a crucial role in educating stakeholders about the importance of implementing these measures.

Analysis of GHG emissions and potential climate change impacts for new development is required under CEQA. The GHG Plan Update provides strategies and guidelines for the reduction of GHG emissions in accordance with CEQA Guidelines Section 15183.5. A GHG Reduction Plan Consistency Checklist (Checklist) is presented to provide a streamlined review process for proposed new development projects that are subject to discretionary review and trigger environmental review pursuant to CEQA.

Finally, the GHG Plan Update in itself is not enough to meet the reduction goals without a commitment to implementation and recurring monitoring. The GHG Plan Update identifies the process for implementing and monitoring the GHG reduction strategies. Through successful implementation of this GHG Plan Update, the City will demonstrate the potential economic, social, and environmental benefits of reducing GHG emissions and providing environmental stewardship within the community.

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LIST OF ABBREVIATIONS AND ACRONYMS

AB	Assembly Bill
ABAU	adjusted business-as-usual
APS	Alternative Planning Strategy
BAU	business-as-usual
BMP	best management practices
BRT	Bus Rapid Transit
CALGreen	California's Green Building Standard Code
CAPCOA	California Air Pollution Control Officers Association
CAFE	Corporate Average Fuel Economy
CARB	California Air Resources Board
CBSC	California Building Standards Commission
CCAP	Climate Change Action Plan
CCR	California Code of Regulations
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CERP	Community Emission Reduction Plan
CH ₄	methane
Checklist	GHG Reduction Plan Consistency Checklist
City	City of Fresno
CNG	compressed natural gas
CNRA	California Natural Resources Agency
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
COG	Council of Governments
CPUC	California Public Utilities Commission
DWR	Department of Water Resources
EIR	Environmental Impact Report
EPA	United States Environmental Protection Agency
EVs	electric vehicles
FAX	Fresno Area Express

FCMA	Fresno Clovis Metropolitan Areas
FEMA	Federal Emergency Management Agency
GHG	greenhouse gas
GHG Plan	Greenhouse Gas Reduction Plan
GHG Plan Update	Greenhouse Gas Reduction Plan Update
GHGRx	Greenhouse Gas Reduction Exchange
GSP	Groundwater Sustainability Plan
GVWR	gross vehicle weight rating
HFCs	hydrofluorocarbons
ICT	Innovative Clean Transit
IPCC	Intergovernmental Panel on Climate Change
LCFS	Low Carbon Fuel Standard
LEV	Low Emission Vehicle (Standards)
LOS	level of service
MEIR	Master Environmental Impact Report
MMT CO ₂ e	million metric tons of carbon dioxide equivalents
MMTCO ₂ e	Million metric tons of carbon dioxide equivalents
MPO	Metropolitan Planning Organization
MT CO ₂ e	metric tons of carbon dioxide equivalent
MTCO ₂ e	Metric tons of carbon dioxide equivalents: a measure of greenhouse gas emissions
N ₂ O	nitric oxide
ODS	ozone depleting substances
OPR	Office of Planning and Research
PEIR	Program EIR
PG&E	Pacific Gas and Electric
PV	photovoltaic
RPS	Renewable Portfolio Standard
RTP	Regional Transportation Plan
RWRF	Regional Wastewater Reclamation Facility
SAFE	Safer Affordable Fuel-Efficient
SB	Senate Bill

SBX7-7	Water Conservation Act of 2009
SCS	Sustainable Community Strategy
SGMA	Sustainable Groundwater Management Act
SJVAPCD	San Joaquin Valley Air Pollution Control District
SR-168	State Route 168
SR-180	State Route 180
SR-41	State Route 41
SR-99	State Route 99
TDM	Transportation Demand Management
UWMP	2010 Urban Water Management Plan
VMT	vehicle miles traveled
VOC	volatile organic compound
ZEB	zero-emission bus
ZEV	Zero-Emission Vehicles
ZNE	zero net energy

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1.0 INTRODUCTION

1.1 PURPOSE

The City of Fresno (City) prepared its first Greenhouse Gas Reduction Plan (GHG Plan) in 2014 as a part of its General Plan and Master Environmental Impact Report (MEIR), which provided a clear mandate for actions on reducing GHG emissions with GHG specific policies and an implementation measure for the City to prepare a GHG Plan. The GHG Plan set a target to reduce GHG emissions by 21.7 percent below 2020 business-as-usual (BAU) levels of emissions by 2020 and included a suite of reduction measures designed to achieve the reduction target. In addition, the GHG Plan also suggested a monitoring program designed to monitor progress by annually documenting the 19 key indicators and citywide vehicle miles traveled (VMT) every 3 years. The GHG Plan discussed “interim” targets for years 2035 and 2050, pursuant to Executive Order S-03-05³ and the Fresno Green Sustainability Strategy⁴. The GHG Plan included projections to show the amount of emission reductions needed to achieve State-aligned targets, but the GHG Plan did not include comprehensive strategies to meet the targets beyond 2020, because of the pending adoption of Statewide regulations for later years. The GHG Plan was considered a “Qualified Plan,” using the criteria found in California Environmental Quality Act (CEQA) Guidelines §15183.5.

Since the adoption of the GHG Plan in December 2014, several events within the California legislature and a decision of the California Supreme Court that affects the GHG Plan have occurred. These events include the California Supreme Court’s published decision on the Newhall Ranch Specific Plan, Governor Brown signing into law Senate Bill (SB) 32, and the California adoption of the 2017 Climate Change Scoping Plan.

On November 30, 2015, the California Supreme Court published its decision on the Newhall Ranch Specific Plan invalidating the Environmental Impact Report (EIR) for a variety of reasons, including the use of 29 percent below BAU as a threshold level of significance for GHG emissions. In this case, the Court found that the EIR did not contain any evidence supporting the threshold. On September 28, 2016, Governor Brown signed SB 32 into law. SB 32 sets a Statewide goal of reducing GHG emissions 40 percent below 1990 levels by 2030. The California Air Resources Board (CARB) was directed to develop a climate change scoping plan update that would provide the regulations and policies to achieve the 2030 reduction target. On December 14, 2017, the CARB finalized “California’s 2017 Climate Change Scoping Plan,” providing quantitative summaries of the regulations needed to achieve the 2030 reduction target.

This GHG Reduction Plan Update (GHG Plan Update) re-evaluates the City’s existing GHG reduction targets and strategies, provides new goals and supporting measures to reflect and ensure compliance with changes in local and State policies, and strives to encourage economic growth to

³ Executive Order S-3-05 laid out GHG reduction targets for State of California: by 2010 reduce GHG emissions to 2000 levels, by 2020 reduce GHG emissions to 1990 levels and by 2050 reduce emissions to 80 percent below 1990 levels.

⁴ The Fresno Green Sustainability Strategy included a commitment to meet the 2020 AB 32 goal and to meet a reduction target of 80 percent below 1990 levels by 2050.

keep the city economically competitive while achieving GHG reductions and maintaining the “CEQA Qualified Plan” status.

1.2 RELATIONSHIP TO THE GENERAL PLAN

The City of Fresno General Plan and the MEIR were adopted in 2014. The General Plan provides a clear mandate for action on GHG emissions with GHG policies and an implementation measure for the City to prepare a Climate Action Plan as part of the General Plan and MEIR. The City developed the GHG Plan, which was concurrently approved with the General Plan and included as an appendix to the MEIR. The intent of the GHG Plan was to achieve compliance with State mandates by focusing on feasible actions the City can take to minimize the adverse impacts of growth and development on climate change and air quality. Since the General Plan was adopted and the MEIR was certified in 2014, some new local, State, and/or federal regulations have been enacted. In order to bring the General Plan into technical conformance with current local and State law, the City is also updating and converting the existing General Plan MEIR to a Program EIR (PEIR) with the goal of extending the life of the Fresno General Plan and the accompanying environmental document by up to 10 years. This update is intended to streamline implementation of the General Plan’s programs and policies by supporting them with updated environmental analysis, a current regulatory framework, and mitigation measures, pursuant to CEQA. As part of the General Plan MEIR Update, the City’s existing GHG Plan is also being updated to comply with current State regulations including SB 32, which has a Statewide goal of reducing emissions 40 percent below 1990 levels by 2030. This GHG Plan Update also reflects the changes in local policies to ensure these changes are accounted for and included in the City’s GHG reduction measures and strategy.

1.3 ORGANIZATION AND PLAN CONTENT

The GHG Plan Update includes the following sections:

- A **Background** section that describes the environmental and regulatory setting for GHGs;
- An **Emission Inventory and Forecasts** section that accounts for the sources of emissions and forecasts to year 2020, 2030, and 2035;
- A **Statewide Reduction Strategy** section that summarizes the reductions from State regulations as outlined in the 2017 Climate Change Scoping Plan, and the reduced 2020, 2030, and 2035 emission forecasts that take into account State and local GHG reduction strategies;
- A **Local Reduction Strategy** section that includes the updates and refinements to the GHG reduction strategies from the 2014 GHG Plan, and new measures to meet the 2020, 2030, and 2035 reduction targets;
- A **Development Project Requirements** section that outlines the development review process used to ensure that future proposed development projects are consistent with the GHG Plan Update. A GHG Reduction Plan Update Consistency checklist to determine future project consistency with GHG Reduction Plan Update; and

- An **Implementation and Monitoring** section that outlines the steps and recommendations for effective implementation and monitoring of the GHG Reduction Plan Update.

1.4 BUILDING ON PRIOR ACTIONS

1.4.1 Fresno Green 2007 Sustainability Strategy

The City of Fresno has taken several important steps to improve the City's sustainability and reduce impacts that include GHG emissions. The Sustainability Strategy includes five Green Visions:

- **New City Beautiful:** Fresno will be nationally recognized for the innovative integration of buildings within their neighborhood context; good urban design; and giving priority to public health, open spaces, public art, historic preservation, urban forests, and the protection of natural habitats.
- **Sierra View 2025:** The Sierra Nevada mountain range will be clearly visible to all Valley residents by 2025. Public health will be improved by having cleaner air, enhanced public transportation, and additional opportunities for walking and cycling.
- **Solar Valley:** Fresno will become a leader in renewable energy use by maximizing new renewable sources as well as increasing the efficiency of its existing uses. Fresno will lead the State in the creation of related innovative technology and new business enterprises. With its abundant sunshine and population growth, the opportunity exists to improve air quality, reduce dependence on foreign energy, and provide attractive new jobs by harnessing solar and other types of renewable energy.
- **Green Enterprises and Economic Development:** The City of Fresno will become a center for innovative business enterprises that focus on the "triple bottom line" of providing environmental, economic, and social benefits.
- **City as Good Steward:** The City of Fresno will lead by example by greening up its facilities and practices, embracing a zero waste initiative, providing appropriate staff resources, and collaborating with other municipalities and agencies to develop regionally based Green programs.

1.4.2 Zero Waste Strategic Action Plan

The City of Fresno Zero Waste Strategic Action Plan, approved February 11, 2008, aims to achieve 75 percent diversion by 2012 and zero waste status by 2025.⁵ Zero Waste is a philosophy and a design principle for the 21st Century that includes recycling but goes beyond recycling by taking a "whole system" approach to the vast flow of resources throughout society. It is a goal and guide for people to emulate sustainable natural cycles, where all discarded materials are resources for others to use.

⁵ Fresno, City of. 2008. *City of Fresno – Zero Waste Strategic Action Plan*. Available online at: swalco.org/DocumentCenter/View/955/Zero-Waste-and-Sustainability---Fresno-CA---Zero-Waste-PDF?bidId= (accessed October 23, 2019).

1.4.3 City of Fresno Urban Water Management Plan

The Water Conservation Act of 2009 (SBX7-7) was enacted in November 2009. SBX7-7 requires urban retail water suppliers, such as the City of Fresno, to develop per capita water use targets to be met by 2015 and 2020. The overall statewide objective of SBX7-7 is to reduce per capita water use by 20 percent by the year 2020. The 2010 Urban Water Management Plan (UWMP) was adopted by the Fresno City Council on November 29, 2012 to meet this requirement. The UWMP contains water conservation best management practices (BMP) to achieve the required reductions in water use. The 2010 UWMP was updated in 2015⁶ and describes the City's water demands and supplies, reliability and water conservation strategies. The 2015 UWMP includes data covering the years from 2011 to 2015 and was adopted by the City Council on June 23, 2016.

1.4.4 Water Efficient Landscape Standards

The City has adopted water conserving landscape requirements that are specified in the City Municipal Code (Section 6-522. Water Efficient Landscape Standards). These requirements define standards and procedures for the design, installation, and management of landscapes in order to utilize available plant, water, land, and human resources to the greatest benefit of the people of the city.

1.4.5 Sustainable Groundwater Management Act

In September 2014, Governor Brown signed legislation requiring that California's critical groundwater resources be sustainably managed by local agencies. The Sustainable Groundwater Management Act (SGMA) provides a framework for the sustainable management of groundwater supplies by local agencies, with a role for State intervention when necessary to protect the resource. The SGMA requires that Groundwater Sustainability Plans (GSPs) be developed for medium- and high-priority groundwater basins identified within the Department of Water Resources (DWR) Bulletin 118 report. Fresno county overlies five groundwater subbasins; Kings, Madera, Delta-Mendota, Westside, and Pleasant Valley. With the exception of Pleasant Valley, the four other basins are currently designated by DWR as high priority and subject to a condition of critical overdraft. The SGMA does not apply outside of mapped groundwater basins. The SGMA defines a process and timeline for local agencies to achieve the goal of sustainable management of groundwater basins. It also provides tools and authorities to take the necessary steps to achieve that goal. For local agencies involved in implementation, the requirements are significant and can be expected to take years to accomplish. As a first step, in March 2015, the Fresno County Board of Supervisors formed a workgroup to advise the Board of Supervisors regarding items relating to the SGMA.

1.4.6 Recharge Fresno

Recharge Fresno is the City's program to improve the pipelines and water system facilities that will capture, treat, and deliver water to Fresno homes and businesses, including surface water from the Sierra Nevada Mountains. This program has the following objectives: ensure a reliable and sustainable water supply for Fresno's present and future prosperity by increasing the available

⁶ Fresno, City of. 2016. *2015 Urban Water Management Plan*. Available online at: www.fresno.gov/publicutilities/wp-content/uploads/sites/16/2016/11/CityofFresno2015UWMP_adopted.pdf (accessed October 23, 2019).

water supply; bring new, treated surface water from the Sierra Nevada Mountains to our community; improve natural and intentional groundwater recharge; maintain focus on conservation and its role in ensuring a sustainable water supply for Fresno; and ensure a safe and reliable water supply.

1.4.7 General Plan Air Quality Update 2009

The Air Quality Update satisfied the requirements of AB 170 that mandated cities and counties of the San Joaquin Valley to address air quality in their General Plans. Many of the goals, policies, and implementation measures that reduce air pollutant emissions also reduce GHGs. In addition, the Air Quality Update included GHG specific policies that are carried forward into the General Plan and formed the basis of the strategy defined in the existing GHG Plan. The GHG Plan Update is built upon the strategies identified in the existing GHG Plan.

1.4.8 Fresno General Plan

The Fresno General Plan was adopted in 2014 and includes the Resource Conservation Element that has objective RC-5, which requires the City to take the necessary and cost-effective actions to achieve and maintain reductions in GHG emissions. The General Plan specifies implementing policies (RC-5-a to RC-5-g) to achieve this objective. The policy RC-5-a requires the City to “Support State Goal to Reduce Statewide GHG Emissions” and RC-5-b requires developing a “GHG Plan” that should be periodically updated to reflect the State GHG regulations. Policy RC-5-b provides the following outlines to achieve objective RC-5:

- A baseline inventory of all known or reasonably discoverable sources of greenhouse gases (GHGs) that currently exist in the city and sources that existed in 1990 (Updated to 2010).
- A projected inventory of the GHGs that can reasonably be expected to be emitted in the city in the year 2035 in accordance with discretionary land use decisions pursuant to this General Plan and foreseeable communitywide and municipal operations.
- A target for the reduction of emissions from those identified sources.
- A list of feasible GHG reduction measures whose purpose shall be to meet the established local reduction target, including energy conservation and “green building” requirements in municipal buildings and private development.
- Periodically update municipal and community-wide GHG emissions inventories to determine the efficacy of adopted measures and to guide future policy formulation needed to achieve and maintain GHG emissions reduction targets.

1.5 CEQA TIERING AND STREAMLINING ANALYSIS OF GREENHOUSE GAS EMISSIONS

New development that would occur with the buildout of the General Plan must address GHG impacts to comply with CEQA. The California legislature has adopted tiering and streamlining provisions in SB 97 that encourage cities to adopt GHG reduction plans as a mechanism to assist with project CEQA

compliance. According to the CEQA Guidelines Section 15183.5,⁷ GHG reduction plans and CAPs must meet the following criteria in order to use CEQA tiering and streamlining provisions:

- A. Quantify GHG emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;
- B. Establish a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable;
- C. Identify and analyze the GHG emissions resulting from specific actions or categories of actions anticipated within the geographic area;
- D. Specify 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;
- E. Establish a mechanism to monitor the plan's progress toward achieving the level and to require amendment if the plan is not achieving specified levels;
- F. Be adopted in a public process following environmental review.

This GHG Plan Update is structured to meet the streamlining criteria listed above. Project compliance with the applicable General Plan policies and strategies identified in the Checklist would result in less-than-significant impacts related to GHG emissions.

1.6 HOW DOES THE PLAN REDUCE GREENHOUSE GAS EMISSIONS?

The largest source of GHGs is the combustion of carbon containing fuels resulting in carbon dioxide (CO₂). Although there are many other GHGs, the GHG Plan Update emphasizes actions under the City's control or influence that can reduce CO₂ emissions. Other GHGs such as methane (CH₄), nitric oxide (N₂O) and refrigerants such as hydrofluorocarbons (HFCs) are addressed in the plan, but have fewer sources and fewer control opportunities at the City level.

Strategies to reduce Citywide GHG emissions include:

- Improve the efficiency of the vehicles so they can achieve the same amount of work using less fuel (e.g., improve aerodynamics in cars and trucks/low friction oils).
- Move to low carbon power generation with zero or low GHG facilities such as solar, wind, biofuels.
- Improve the efficiency of the combustion process in the City-owned facilities to obtain more energy from the fuel being burned (e.g., high-efficiency burners, better fuels).

⁷ CEQA Guidelines 15183.5 describes requirements of a GHG Reduction Plan that would mitigate cumulative levels of GHG emissions within a jurisdiction to a less-than-significant level and allows development project tiering from the GHG Reduction Plan.

- Conservation programs to reduce water use (reduced energy for water pumping and transport).
- Sequestration in urban forests (storing greenhouse gases).
- Reduce municipal waste to reduce emissions from transport and decomposition (e.g. recycling, reuse, diversion).

The GHG Plan Update provides a comprehensive approach utilizing different GHG reduction strategies to achieve emission reductions sufficient to demonstrate consistency with State of California targets. The GHG Plan Update builds on the General Plan policies and implementation measures. Where needed, the GHG Plan Update provides more details to clarify and focus action and to streamline implementation.

1.7 RELATIONSHIP TO STATE AND FEDERAL ACTIONS TO REDUCE GREENHOUSE GAS EMISSIONS

Efforts by cities to reduce GHGs are an important part of larger effort implemented by the State of California and to a lesser degree the federal government. Limited action has taken place on the federal level to reduce GHG emissions, making State of California actions the most important to the City. California has implemented ambitious control strategies to reduce GHG emissions. The State recognizes the magnitude of the challenge of reducing GHGs to the extent needed to prevent catastrophic effects of climate change is such that reductions throughout the state, including those at the local level, are required. Climate change is a global problem that will take unprecedented cooperation and action at international, national, state, and local levels. California has chosen to be a leader in this effort and a model for others to follow.

1.8 COMMUNITY REDUCTION TARGETS

Future development anticipated by the City of Fresno creates challenges and opportunities for reducing GHG emissions sufficiently to ensure that growth will not hinder or obstruct the implementation of State GHG regulations including AB 32 and SB 32. Cities with relatively high rates of growth, such as Fresno will produce a larger share of GHG emissions in the future compared with slow-growing and built-out parts of the State. However, new development presents opportunities, with its ability to incorporate the latest technologies into buildings to reduce energy use and its ability to build complete neighborhoods and commercial areas in ways that reduce vehicle travel. The policy mechanisms such as SB 743 further support environmentally beneficial development by allowing CEQA to facilitate the implementation of transit-oriented infill development.

1.8.1 2020 Reduction Target

AB 32 requires CARB to reduce Statewide GHG emissions to 1990 levels by 2020. As part of this legislation, CARB was required to prepare a “Scoping Plan” that demonstrates how the State will achieve this goal. The Scoping Plan was first adopted in 2011 and in it local governments were described as “essential partners” in meeting the Statewide goal, recommending a GHG reduction level of 15 percent below 2005 to 2008 level, depending on when a full emissions inventory is available, by 2020.

Reductions will be achieved by existing development and new projects. Residents of new development projects will achieve lower per capita rates than residents of existing development. This is because of greater energy efficiency in new structures and lower motor vehicle travel resulting from the project designs and higher development densities anticipated from General Plan implementation.

1.8.2 Targets After 2020

The CARB released the First Update to the Climate Change Scoping Plan on February 10, 2014 (CARB 2014). The draft update emphasized the need for a mid-term target between 2020 and 2050 to provide a continuum of action to reduce cumulative emissions. The EO B-30-15 and SB 32 required CARB to reduce Statewide GHG emissions to 40 percent below 1990 levels by 2030. The EO B-30-15 further stated that the emission reduction target of 40 percent below 1990 levels by 2030 is an interim-year goal to make it possible to reach the ultimate goal of reducing emissions 80 percent under 1990 levels by 2050. The order directs CARB to provide a plan with specific regulations to reduce Statewide sources of GHG emissions. The Executive Order does not include a specific guideline for local governments. The 2017 Scoping Plan recommends local plan level GHG emissions reduction goals (CARB 2017).

At the growth rates projected for General Plan buildout, the city could continue to grow through 2050 without designating additional land for development. The General Plan and the GHG Plan Update ensure that the City of Fresno will do its part of reducing GHG emissions for the short-term (2020) and the long term (2050).

1.9 CHALLENGES AND OPPORTUNITIES

The effects of GHG emissions are cumulative. Global warming is the result of emissions from every source on the globe that combine to increase GHG concentrations in the atmosphere. Scientific evidence supports the need for drastic worldwide reductions to prevent catastrophic climate change. According to the Intergovernmental Panel on Climate Change (IPCC) to limit the global warming to 1.5 degree Celsius above pre-historic levels the world would have to curb its carbon emissions by at least 49 percent of 2017 levels by 2030 and then achieve carbon neutrality by 2050 (Nature 2018). This leads to the following questions:

- What is California's responsibility for reducing emissions?
- What is local government's responsibility for reducing emissions?
- What is an individual development project's responsibility for reducing emissions?
- What is each person's responsibility for reducing emissions?

The government structure in the United States with its checks and balances limits the power of the states to take action to reduce GHGs. For example, states are not allowed to interfere with interstate and international commerce; however, powers that are not vested in the federal government are reserved for the states. Individual rights for people to live how and where they want are also highly prized. This structure creates challenges for reducing GHG emissions that touch every sector of the economy and that are greatly influenced by individual choices and actions. With uneven action among the states and nations, the potential exists for regulations to cause businesses simply to relocate their emissions to nations, states, or cities with weak or no regulations. Fortunately, many

actions that reduce GHG emissions produce multiple benefits that offset the cost of implementation. However, it must be recognized that individuals or organizations implementing the action may not directly benefit from cost savings or may have difficulty with initial capital costs.

A thorough discussion of regulatory authority for GHG emissions is provided in Section 2. In short, the State has broad authority to regulate GHG emission sources. It has authority to regulate GHGs from motor and transit vehicles, power generation, and industrial processes, and sets efficiency standards for buildings, lighting, appliances, water use, and waste management/recycling. On the other hand, local government's role is mostly a supportive one. Local government is called upon to support state programs and to use its land use authority and police power to reduce GHG impacts. For example, local government is authorized by the State to adopt ordinances that exceed energy standards for buildings and exceed water conservation and recycling mandates. Through the development review process and CEQA, local government can require or encourage project designs that produce fewer vehicle trips and miles traveled and include mitigation measures with which projects must comply as conditions of approval.

Individual choice plays an important role in reducing GHG emissions. The State can mandate increasing numbers of EVs to be sold in California to meet emission standards, but it cannot force people to buy them. It can mandate energy efficient appliances and buildings but cannot make people turn out the lights and turn down the thermostat to save energy. It cannot prevent people from buying more and bigger televisions. However, the State and the City can provide incentives and disincentives that affect choice to align with the goal of reducing GHG emissions.

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2.0 BACKGROUND INFORMATION

GHG emissions and climate change are complex issues that are the topics of hundreds of books, research papers, and policy documents. This section of the GHG Plan Update provides a brief overview of climate change and the local factors that affect the GHG emission inventory. The following information provides a discussion in a city of Fresno context.

2.1 CITY OF FRESNO BACKGROUND

The GHG Plan Update uses population, employment, and housing statistics as the basis for estimating current and future year emissions and reduction targets.

2.1.1 Location and Constraints to Growth

The city of Fresno is located in Fresno county, which is generally located in the center of the San Joaquin Valley, the most productive agricultural region in the nation and the world. Fresno's central location in California between San Francisco (184 miles) to the north and Los Angeles (222 miles) to the southwest has made it an important regional center.

There are no significant physical barriers to Fresno's future growth; however, political boundaries and policy considerations are very important in shaping future growth. The San Joaquin River and the Fresno/Madera County line run along the northern edge of the city. The city of Clovis abuts Fresno to the northeast and east, preventing growth in that direction. The land southeast, south and west are mostly prime farmland. The southeast area is a long-term growth area in the General Plan. No expansion of the sphere of influence is planned in the General Plan.

2.1.2 Transportation Facilities

The city of Fresno is crossed by two important State highways used for regional travel and commerce. State Route 99 (SR-99) runs northwest/southeast through the city, connecting Fresno to northern and southern California. State Route 41 (SR-41) connects Fresno to the Central Coast and is a main route to Yosemite National Park. SR-41 also acts as a primary commuter facility between northern and southern parts of Fresno. State Route 168 (SR-168) runs north/east to Clovis acting as a commute facility and beyond to the Sierra Nevada. SR-168 intersects with State Route 180 (SR-180), which runs east/west through the city, connecting Fresno with the communities of western Fresno county and with Kings Canyon and Sequoia National Parks.

Fresno is on the California High Speed Rail route and a station is planned for downtown Fresno. High Speed Rail is anticipated to be a major catalyst for development and redevelopment in Fresno, although the General Plan is not reliant on it to achieve its stated infill, development, and redevelopment goals. Fresno currently receives rail service from Amtrak. The City of Fresno's Transportation Department, via Fresno Area Express (FAX), provides bus transit service. FAX offers

17 fixed-route bus lines and Handy Ride Paratransit Service⁸ FAX operates a modern clean and green fleet of over 100 buses.

2.1.3 General Plan Footprint and Buildout Statistics

The city of Fresno has a substantial development footprint. The General Plan Planning Area is 166 square miles (106,027 acres), which includes the 162 square miles (103,570 acres) sphere of influence, and the 4 square miles (2,486 acres) North Area, located at the northern tip of the city. The sphere of influence consists of both the incorporated 113 square mile city (72,224 acres) and the 49 square mile unincorporated county (33,803 acres) land. Some of the unincorporated land is completely surrounded by the city of Fresno and is referred to as a “county island,” whereas other unincorporated land lies adjacent to the outer fringe of the city.

The sphere of influence is a boundary that encompasses lands that are expected to ultimately be annexed into the city. Until annexed, the lands are unincorporated and fall under the jurisdiction of the County of Fresno.

In accordance with the requirements of the State of California, the Local Agency Formation Commission (LAFCO) authorizes a “sphere of influence” around municipalities as the probable physical boundary and ultimate service area of that government.

Table 2-A shows the acreage within the General Plan Planning Area when the General Plan was approved.

Table 2-A: General Plan Statistics

Land Use Designations	General Plan Acreage
Residential	46,043
Commercial	6,913
Industrial	9,578
Mixed use	4,223
Public facilities	17,671
Open space	3,001
Other	18,598
TOTAL	106,027
Projected Population at Build-out	970,000

Source: City of Fresno Planning and Development Department (2019)

Table 2-B provides additional detail in terms of land use type for existing development and development anticipated with the continued implementation of the General Plan. The General Plan envisions an increase in the amount of multi-family residential compared with single-family residential development. The City assumes buildout of the General Plan Planning Area would occur after 2056.

⁸ Fresno, City of, 2019. Department of Transportation, Fresno Area Express Routes. Website: www.fresno.gov/transportation/fax/routes (accessed October 23, 2019).

Table 2-B: General Plan Buildout Statistics

Land Use	Existing Development		General Plan Implementation		Incremental Increase	
	MSF	Acres	MSF	Acres	MSF	Acres
Single-Family Residential	109,000	26,147	169,626	38,961	60,626	12,814
Multiple-Family Residential	62,288	3,496	146,826	6,605	84,538	3,109
Commercial/Office/Public Facility	66.4	14,804	129.7	26,517	63.3	11,712
Mixed Use	0.1	10	20.9	4,213	20.8	4,223
Industrial	72.8	6,765	113.3	9,578	40.5	2,813
Open Space	—	12,288	—	1,546	—	-10,742
Agriculture	—	11,714	—	736	—	-10,978
Vacant	—	12,522	—	0	—	-12,522
Other	—	18,281	—	17,861	—	-420
Total	—	106,027	—	106,027	—	0
Population (persons)	545,000		970,000		425,000	

Source: City of Fresno Development and Resource Management Department (2012).

msf = million square feet

The growth statistics reveal two important points. First, substantial growth is projected for Fresno over the coming decades and that growth will increase GHG emissions. Second, the proposed mix of land uses that would accommodate the growth in population will increase development density.

Increased density when combined with a strong pedestrian and transit orientation can reduce motor vehicle travel and related GHG emissions.

2.2 CLIMATE CHANGE BACKGROUND

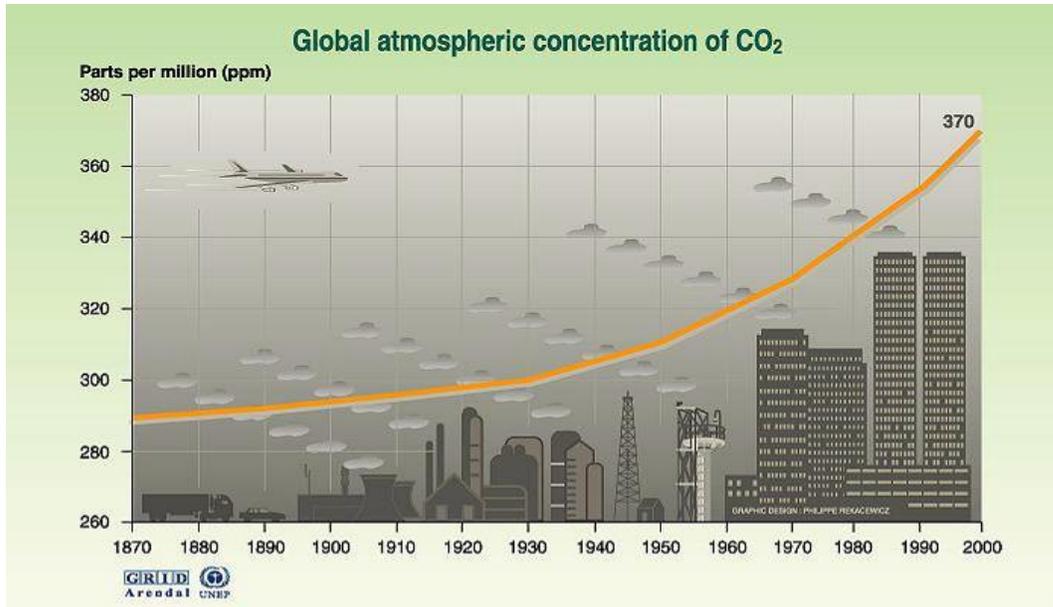
Climate scientists refer to gases that trap heat in the atmosphere as greenhouse gases. The effect is analogous to the way a greenhouse retains heat. The energy influx is maintained by three main factors: the amount of energy coming in, which depends on the earth's distance from the sun and solar activity; the albedo (the ability of the earth's surface to reflect light); and the chemical composition of the atmosphere. The presence of GHGs in the atmosphere regulates the earth's temperature.

The chemical composition of the atmosphere changes over time. Natural processes and human activities emit GHGs. As shown in Figure 2-1, carbon dioxide concentrations in the atmosphere have increased over time. The global atmospheric concentration of carbon dioxide (CO₂) data in Figure 2-1 prior to 1958 is from ice core measurements and post-1958 data are from the Mauna Loa, Hawaii site (NOAA 2019).

2.2.1 Global Warming Potential

GHGs have varying global warming potential and atmospheric lifetimes. Carbon dioxide, the reference gas for global warming potential, has a global warming potential of 1. The calculation of the carbon dioxide equivalent (CO₂e) is a consistent methodology for comparing emissions, since it normalizes various emissions to a consistent metric. Methane's warming potential of 21 indicates that methane has a 21 times greater warming effect than carbon dioxide on a molecule per

Figure 2-1: Global Atmospheric Concentration of CO₂



molecule basis. A carbon dioxide equivalent is the mass emissions of an individual GHG multiplied by its global warming potential. Emissions are typically shown in MT CO₂e or a million times that, million metric tons of carbon dioxide equivalents (MMT CO₂e). Global warming potentials are shown in Table 2-C.

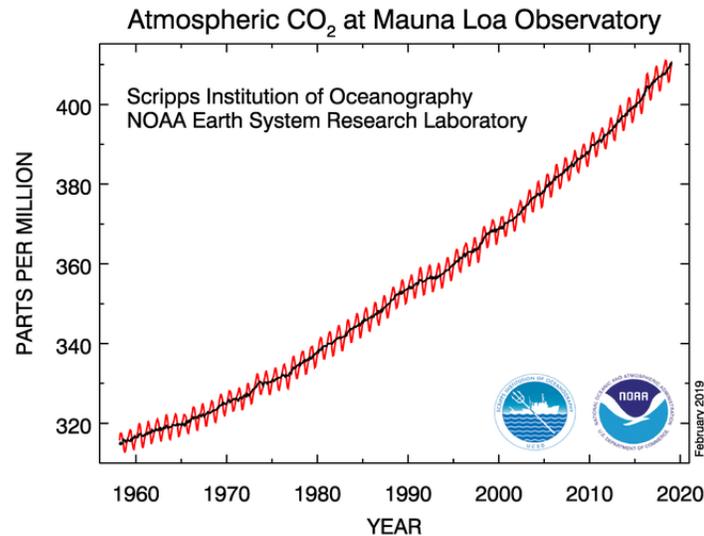
Table 2-C: Global Warming Potentials

Greenhouse Gas	Global Warming Potential
Carbon dioxide (CO ₂)	1
Methane (CH ₄)	21
Nitrous oxide (N ₂ O)	310

Source: Intergovernmental Panel on Climate Change (2007).

2.2.2 Global Climate Change Trends

Figure 2-2 provides a more detailed look of concentrations since 1960 showing continuing steady increases even with international actions that have been taken to date. The National Oceanic and Atmospheric Administration reported that the global average CO₂ concentration was 410 parts per million (ppm) in 2019 (NOAA 2019).

Figure 2-2: Carbon Dioxide Concentrations 1960 to 2019

Source: NOAA 2019: Trends in Atmospheric Carbon Dioxide. Full Mauna Loa CO₂ Record.

2.2.3 Greenhouse Gas Emission Inventories

Emission inventories are databases that list by source and pollutant the amount of air pollutants discharged into the atmosphere during a given period of time. Inventories can range from individual businesses, cities, counties, states, nations, to global in scope. Emission inventories are used to help determine significant sources of air pollutants, establish emission trends over time, and target regulatory actions.

Emissions of GHGs are a true cumulative impact. Emissions anywhere and everywhere in the world contribute to increased concentrations of GHGs in the atmosphere and the potential for climate change. Viewing the emissions output at global, national, state, and local levels is important to understanding the scale of the problem and the relative contribution of each level of government organization.

Global carbon emissions from fossil fuels have increased rapidly since 1900 and continue to increase at an even faster pace since the year 2000 (EPA 2018). Figure 2-3 shows this trend with particularly dramatic increases after World War II and more recently with rapid increases in China and other rapidly industrializing nations in the last decade. Emissions have increased over 600 percent since 1950. The increases in emissions are consistent with the atmospheric concentrations shown in Figure 2-2 and Figure 2-3.

GHG 2017 inventory for all sources in the United States and California is shown in Table 2-D. The percentage of emissions for the United States is 12.2 percent of the global total yet accounts for only 4.4 percent of the world's population. This places extra responsibility for the United States to take a leadership role and to act as a model for other nations to follow. Although previous international efforts have not made substantial progress in slowing the growth in GHG emissions,

Figure 2-3: Increases in Global Carbon Dioxide Emissions from Fossil Fuels 1900 to 2014



Source: EPA (2018).

Table 2-D: United States, California, and World GHG Emission Inventory (CO₂e)

Inventory	MMT CO ₂ e	Percent of Total
California (2017)	424.1	0.8
United States (2017)	6,457	13.09
World (2016)	49,300	100

Sources: CARB 2019, EPA 2018, and PBL 2017.

CO₂e = carbon dioxide equivalent

GHG = greenhouse gas

MMT = million metric tons

the United States has many reasons to change to lower carbon economy. For example, reducing energy imports and increased energy security, cost savings from efficiency, employment in renewable energy.

2.3 EFFECTS OF CLIMATE CHANGE ON FRESNO

Scientific research indicates that an increase in global average temperature of 2 degrees Centigrade (°C) (3.6 degrees Fahrenheit [°F]) above pre-industrial levels poses risks to natural systems and human health and well-being. This is only 1.1°C (2.0°F) above present levels. In order to avoid temperatures above those levels, studies indicate that a concentration at or below 450 ppm CO₂e must be achieved. Other studies indicate a stable concentration of about 400 ppm CO₂e will be needed to prevent the 2.0°C (3.6°F) increase. As shown in Figure 2-2 above, readings at the Mauna Loa monitoring station have already exceeded 410 ppm CO₂e and the international average is likely to exceed 400 ppm in a few years. The existing trend is likely to cause substantial harm to future generations and nature (CARB 2014).

Despite efforts to reduce GHG emissions, these gases can remain in the atmosphere for hundreds of years and emissions are expected to continue to increase globally for some time. Therefore, it is probable that climate change impacts will be observed. The impacts are predicted to vary by region. In California, climate change may result in a decreased water supply, sea level rise, and increased wildfires, to name a few. In order to manage these impacts, the city's vulnerability to these impacts is assessed and strategies have been developed to adapt to the projected changes.

Determining potential future impacts from climate change is an evolving process. The 2009 California Climate Adaptation Strategy provides a proactive foundation for an ongoing adaptation process within California for the sectors with the greatest risks. The document provides strategies for state and local governments to adapt to climate change (CNRA 2009). By incorporating applicable strategies as Implementation Strategies, the City is taking a proactive approach to ensure that impacts to the city are minimized.

The following discussion describes the main risks from climate change that could be experienced in the city of Fresno. The General Plan sections related to safety, public utilities, hydrology, and resource conservation contain policies that would decrease the risks to residents of the city. In general, City programs and policies to respond to existing levels of risk may need to be implemented more frequently or expanded to protect city residents and resources from potential impacts from climate change. Response to more or bigger events can be expected to demand more city resources.

2.3.1 Wildfire

The city of Fresno is surrounded by irrigated agricultural lands, rural residential development, and the city of Clovis that are not subject to wildfire to any great extent. Fallow farmland and vacant land with weedy growth can become a fire hazard if not maintained. The San Joaquin River bluff area along the city's northern boundary could experience longer dry seasons and greater threats from wildfire.

2.3.2 Water

One of the potential impacts of climate change is a loss of natural snowpack, particularly the Sierra Nevada snowpack. Snowmelt provides an annual average of 15 million acre-feet of water, released between April and July each year (Department of Water Resources 2008). The California Department of Water Resources projects that the Sierra snowpack will experience at least a 25 percent reduction from its historic average by 2050 (DWR 2014). Climate change is also anticipated to bring warmer storms that result in less snowfall at lower elevations, reducing the total snowpack.

Changes in precipitation patterns are expected to cause increased flooding. For the purposes of federal flood insurance, the Federal Emergency Management Agency (FEMA) has traditionally used the 100-year flood event, which refers to the level of flood flows that has a 1 percent chance of being exceeded in any single year. As California's hydrology changes, what is currently considered a 100-year flood may strike more often, leaving many communities at greater risk. Moreover, as peak flows and precipitation change over time, climate change calls into question assumptions of "stationarity" that are used in flood-related statistical analyses such as the 100-year flood. That is, the probable area of inundation does not change from year to year.

The California Department of Water Resources (2008) recommends that local governments implement land use policies that decrease flood risk. These following recommendations are included as GHG Plan implementation policies where applicable and feasible.

- Local land use agencies should update General Plans to address increased flood risks posed by climate change. General Plans should consider an appropriate risk tolerance and planning horizon for each locality.
- Local governments should site new development outside of undeveloped floodplains unless the floodplain has at least a sustainable, 200-year level of flood protection.
- Local governments should use low-impact development techniques to infiltrate and store runoff.
- Local governments should include flood-resistant design requirements in local building codes. State, federal, and local agencies should develop conjunctive use management plans that integrate floodplain management, groundwater banking, and surface storage. Such plans could help facilitate system reoperation and provide a framework for the development of local projects that are beneficial across regions.
- Local land use agencies should adopt ordinances that protect the natural functioning of groundwater recharge areas.



San Joaquin River Bluffs



San Joaquin River

As precipitation falls in the form of rain rather than snow with greater storm intensity, high-frequency flood events are projected to increase. There is currently no known literature that suggests an increase in flooding from climate change in the Fresno area; however, it is possible that there could be changing weather patterns that would result in heavy downpours of rain in the area, which could cause street flooding. In addition, the potential for increased wildfires in foothill and mountain areas upstream from Fresno resulting from climate change could increase floods following fire if reservoirs had insufficient capacity to capture the runoff at that time.

2.4 FEDERAL, STATE, AND REGIONAL ACTIONS TO ADDRESS CLIMATE CHANGE

2.4.1 United States Environmental Protection Agency

The United States Environmental Protection Agency (EPA) is responsible for implementing federal policy to address global climate change. The federal government's early efforts have focused on public-private partnerships to reduce GHG intensity through energy efficiency, renewable energy, methane and other non-CO₂ gases, agricultural practices, and implementation of technologies to achieve GHG reductions.

The EPA is required to regulate carbon dioxide and other GHGs as pollutants under Section 202(a)(1) of the federal Clean Air Act. The first step in implementing its authority was the Mandatory Reporting Rule that required inventory data collection commencing on January 1, 2010 with first reports due March 2011. Effective January 2, 2011, the EPA requires new and existing sources of GHG emissions of 75,000 tons per year to obtain a permit under the New Source Review Prevention of Significant Deterioration and Title V Operating Permit Program.

The main federal regulatory program for automobiles is the Corporate Average Fuel Economy (CAFE) program, which has been in place since 1975. Under previous administrations, CAFE was the primary means of limiting mobile source carbon emissions. Rules finalized in 2012 put in place binding standards through Model Year 2021 and offered estimated standards through 2024. The federal light-duty vehicle standards were developed in two phases that harmonized with California standards through 2016 (Phase 1) and 2025 (Phase 2) and developed the first ever federal GHG standards for medium-duty and heavy-duty vehicles. At the time, the EPA estimated that the new standards in this rule would reduce CO₂ emissions by approximately 270 MMT and save 530 million barrels of oil over the life of vehicles sold during the 2014 through 2018 model years.

In 2018, however, the EPA proposed a new, less-stringent set of standards called the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks. The SAFE Vehicles Rule would amend certain existing CAFE and tailpipe CO₂ emissions standards for passenger cars and light trucks and establish new standards, all covering model years 2021 through 2026. The standards have yet to be finalized.

In June 2013, President Obama approved the nation's first Climate Action Plan that lays out a series of executive actions to reduce carbon pollution, prepare the nation for the impacts of climate change, and lead international efforts to address global climate change. The Plan reiterated the President's 2009 pledge to reduce United States GHG emissions by 17 percent below 2005 levels by 2020. Under the President Trump administration, the nation's stance on climate change has shifted from being a part of global action to policy stagnation and deregulation. In June 2017, the U.S. decided to withdraw from the Paris Climate Agreement, which was an agreement among countries to reduce global GHG emissions resulting from the 2015 United Nations Climate Change Conference. Currently, the EPA has been engaged in research into approaches to reduce the U.S. contribution to climate change. Areas of climate research include economic analyses of regulatory policy instruments (e.g., emissions trading, estimation of GHG reduction benefits, the role of uncertainty, and modeling the economic impacts of ocean acidification). In the meantime, many U.S. States and

companies are putting in place their own commitments to reduce global climate change by enacting local climate action plans, policies, and standards.

2.4.2 State of California

California has adopted a variety of regulations aimed at reducing the State's GHG emissions. While state actions alone cannot stop climate change, the adoption and implementation of this legislation demonstrates California's leadership in addressing climate change. Key legislation and Executive Orders pertaining to the State's reduction targets are described below.

2.4.2.1 Executive Order S-3-05

California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S-3-05, the following reduction targets for GHG emissions:

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

The State achieved the first goal of reducing emissions to 2000 levels by 2010. Total GHG emissions were reduced by 2.9 percent during that period even though population increased by 10.9 percent in the same period (CARB 2014). The State also appears to be on track for achieving the 2020 target.

2.4.2.2 Executive Order B-30-15

On April 29, 2015, California Governor Jerry Brown announced through EO B-30-15 the following GHG emissions target:

- By 2030, California shall reduce GHG emissions to 40 percent below 1990 levels.

The emissions reduction target of 40 percent below 1990 levels by 2030 is an interim-year goal to make it possible to reach the ultimate goal of reducing emissions 80 percent below 1990 levels by 2050. The order directs CARB to provide a plan with specific regulations to reduce Statewide sources of GHG emissions. EO B-30-15 does not include a specific guideline for local governments.

2.4.2.3 Assembly Bill 32 (AB 32) and Senate Bill 32 (SB 32), California Global Warming Solutions Act

AB 32 requires CARB to reduce Statewide GHG emissions to 1990 levels by 2020. As part of this legislation, CARB was required to prepare a "Scoping Plan" that demonstrates how the State will achieve this goal. The Scoping Plan was adopted in 2011, and in it, local governments were described as "essential partners" in meeting the Statewide goal, recommending a GHG reduction level of 15 percent below 2005 to 2008 levels (depending on when a full emissions inventory is available) by 2020.

CARB released the 2017 Scoping Plan in November 2017. The 2017 Scoping Plan provides strategies for achieving the 2030 target established by EO B-30-15 and codified in SB 32 (40 percent below 1990 levels by 2030). The 2017 Scoping Plan recommends local plan-level GHG emissions reduction goals.

2.4.2.4 SB 375

SB 375 aligns regional transportation planning efforts, regional GHG reduction targets, and affordable housing allocations. Metropolitan Planning Organizations (MPOs) are required to adopt a Sustainable Communities Strategy, which allocates land uses in the Metropolitan Planning Organization's Regional Transportation Plan. Qualified projects consistent with an approved Sustainable Communities Strategy or Alternative Planning Strategy and categorized as "transit priority projects" would receive incentives under new provisions of CEQA. SB 375 requires regional reduction targets for light duty passenger vehicle CO₂ emissions for each MPO.

2.4.2.5 AB 1493 (Pavley)



The Pavley Bill enacted in 2002 requires the maximum feasible and cost-effective reduction of GHGs from automobiles and light-duty trucks. In 2004, CARB approved the "Pavley I" regulations that applied to new passenger vehicles beginning with model year 2009 through 2016. Pavley I is expected to reduce GHG emissions from regulated vehicles by 30 percent from 2002 levels by 2016. Pavley II was incorporated into Amendments to the Low-Emission Vehicle Program referred to as LEV III. The amendments, effective August 7, 2012, apply to vehicles for model years 2017 through 2025. The regulation will reduce GHGs from new cars by 34 percent from 2016 levels by 2025 (CARB 2011).

2.4.2.6 Title 24 Energy Efficiency Standards



The State has adopted several other major regulations that will provide substantial reductions in GHGs. Title 24, Part 6 California's Energy Efficiency Standards for Residential and Nonresidential Buildings were first established in 1978 to reduce California's energy consumption. The California Energy Commission revises Title 24 about every three years to incorporate cost-effective energy efficiency technological advancements into the construction of new buildings. The latest version is the 2019 Title 24 update, which will go into effect January 1, 2020. The 2019 Title 24 standards include the requirement by the California Public Utilities Commission (CPUC) Energy Efficiency Strategic Plan for net zero energy consumption for new residential development starting in 2020 and will ultimately incorporate requirements for net zero in new non-residential development by 2030.

2.4.2.7 Green Building Code

The California Green Building Standard Code (CALGreen) was adopted in 2010 and went into effect January 2011 (CGBSC 2010). CALGreen is a mandatory green building code that sets minimum environmental standards for new buildings including standards for volatile organic compound (VOC) emitting materials, water conservation, and construction waste recycling.

2.4.2.8 Senate Bill 97

SB 97, enacted in 2007, amends the CEQA statute to clearly establish that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis. The legislation directed the California Office of Planning and Research to develop draft CEQA Guidelines "for the mitigation of GHG emissions or the effects of GHG emissions" and directed the California Natural Resources

Agency to certify and adopt the State CEQA Guidelines. CEQA Guidelines Section 15183.5, Tiering and Streamlining the Analysis of GHG Emissions, was added as part of the CEQA Guideline amendments that became effective in 2010 and describes the criteria needed in a GHG reduction plan that would allow for the tiering and streamlining of CEQA analysis for development projects.

2.4.2.9 Senate Bill x7-7

SB x7-7 requires water suppliers to reduce urban per capita water consumption 20 percent from a baseline level by 2020.

2.4.2.10 Renewable Portfolio Standard

The Renewable Portfolio Standard (RPS) requires energy providers to derive 33 percent of their electricity from qualified renewable sources by 2020. In 2018, the State Assembly passed and Governor Jerry Brown signed SB 100, which requires energy providers to derive 60 percent of their electricity from qualified renewable sources by 2030 and 100 percent by 2045. The RPS is anticipated to lower emission factors (i.e., fewer GHG emissions per kilowatt-hour used) from utilities across the State, including Pacific Gas and Electric (PG&E).

2.4.2.11 Innovative Clean Transit (ICT) Regulation

The ICT regulation was adopted in December 2018 and requires all public transit agencies to gradually transition to a 100 percent zero-emission bus (ZEB) fleet. Beginning in 2029, 100 percent of new purchases by transit agencies must be ZEBs, with a goal for full transition by 2040. It applies to all transit agencies that own, operate, or lease buses with a gross vehicle weight rating (GVWR) greater than 14,000 pounds. It includes standard, articulated, over-the-road, double-decker, and cutaway buses.

2.4.2.12 Other Regulations

The CARB has adopted numerous regulations on sources of GHGs since the approval of the Climate Change Scoping Plan. Some of the more notable regulations include the Low Carbon Fuel Standard (LCFS) and regulations affecting vehicle efficiency such as the Tire Pressure Program, Low Friction Oil, and Heavy Duty Vehicle Aerodynamic Efficiency Standards. Also important are CARB regulations that apply to high global warming potential consumer products and refrigerants. SB 734, which requires the Governor's Office of Planning and Research (OPR) to amend the CEQA Guidelines to provide an alternative to level of service (LOS) for evaluating transportation impacts. The law requires that those alternative criteria promote the reduction of GHG, the development of multimodal transportation networks, and a diversity of land uses.

2.4.3 Fresno County Council of Governments

2.4.3.1 SB 375 Regional Targets and Sustainable Community Strategy (SCS)

SB 375 aligns regional transportation planning efforts, regional GHG reduction targets, and affordable housing allocations. Metropolitan Planning Organizations (MPO) are required to adopt a Sustainable Communities Strategy (SCS), which allocates land uses in the Metropolitan Planning Organization Regional Transportation Plan (RTP). Qualified projects consistent with an approved SCS

or Alternative Planning Strategy and categorized as “transit priority projects” would receive incentives under new provisions of CEQA.

In 2010, as part of its mandate under SB 375, the CARB set specific GHG emission reduction targets for cars and light trucks for each of the State’s 18 metropolitan planning organizations from a 2005 base year. The GHG targets set for the Fresno region in 2010 called for a 5 percent per capita reduction by 2020 and a 10 percent per capita reduction by 2035. SB 375 requires that Fresno Council of Governments (COG) demonstrate in its SCS that GHG emission reduction targets will be met for 2020 and 2035. If not, then an Alternative Planning Strategy (APS) shall be prepared to demonstrate how the targets can be met through the alternative strategies in the APS. These numbers are subject to changes due to model validation, calibration, and ongoing local coordination efforts. The MPO growth scenario focuses on existing core areas without expansion of the city of Fresno sphere of influence (CARB 2010). Under the General Plan, growth would be distributed along major corridors and activity centers supported by the Bus Rapid Transit (BRT) system, and has a theme of complete neighborhoods to provide convenient access to different uses at the neighborhood level. The strategy relies on a combination of increasing density, mixed uses, and infill.

The Fresno COG developed an SCS to implement SB 375 requirements. The SCS, adopted by the Fresno COG on June 26, 2014 demonstrated that Fresno County will be able to achieve the GHG targets for light-duty vehicle travel adopted by the CARB for this area. In July 2018, the Fresno COG adopted a second SCS based on the previous SCS adopted in 2014. The Fresno COG would be able to meet the CARB GHG targets through 2018 RTP/SCS (Fresno COG 2018).

2.4.3.2 San Joaquin Valley Blueprint

The San Joaquin Valley Blueprint Planning Process is an effort by agencies, organizations, and individuals, including the Fresno COG, to identify visions, values, guiding principles, and alternative growth scenarios for development over a 20-year planning horizon. The 2018 RTP/SCS continues the blueprint development process that started in 2006.

The adopted 12 Blueprint Smart Growth Principles from this process are:

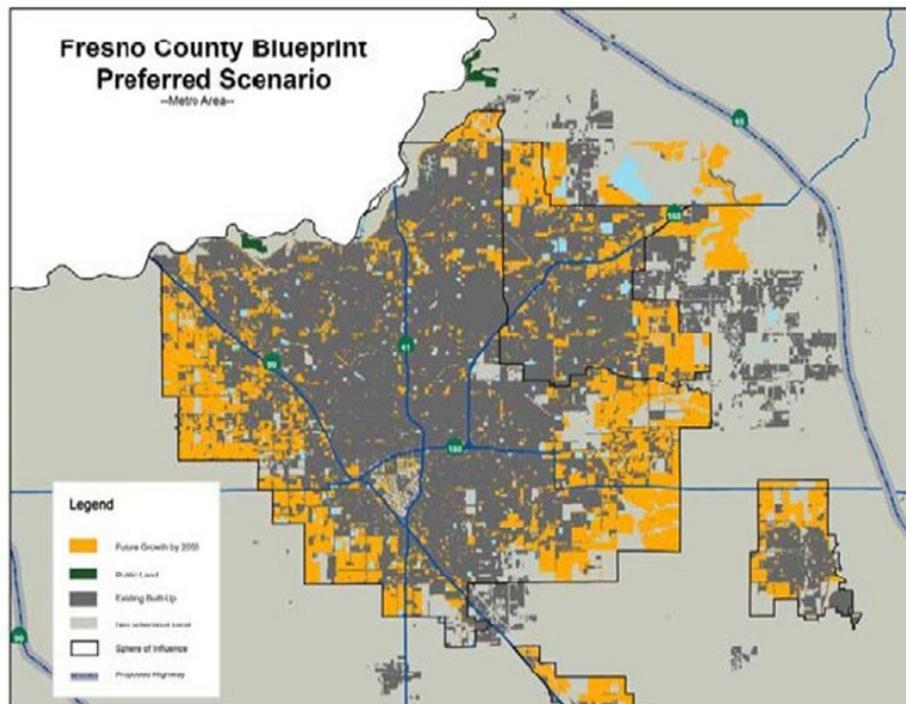
1. Create a range of housing opportunities and choices.
2. Create walkable neighborhoods.
3. Encourage community and stakeholder collaboration.
4. Foster distinctive, attractive communities with a strong sense of place.
5. Make development decisions predictable, fair, and cost-effective.
6. Mix land uses.
7. Preserve open space, farmland, natural beauty, and critical environmental areas.
8. Provide a variety of transportation choices.
9. Strengthen and direct development towards existing communities.
10. Take advantage of compact building design.
11. Enhance the economic vitality of the region.
12. Support actions that encourage environmental resource management.

Fresno County's Blueprint Vision is as follows:

- Fresno County will be composed of unique cities, communities and a diverse population in a connected high quality environment that accommodates anticipated population growth and is supported by:
 - A vibrant economy built on competitive strength and world class education
 - A healthy and sustainable environment where air, aquifers, surface waters, forests, soil, agriculture, open space and wildlife resources are enhanced and protected
 - A focus on cultural and community stewardship where all people enjoy fundamental rights as members of a free society, and where the community takes ownership of problems and their solutions.

The form of the Fresno region blueprint recognizes its economic, environmental, and cultural connectedness while maintaining a system of high-capacity multimodal transportation corridors that link the metro area to the rural areas and the State while preserving and maintaining the character of individual communities and the vital agricultural and natural resources between and around them (Fresno COG 2009). Figure 2-4 shows the Fresno County Blueprint preferred scenario.

Figure 2-4: Fresno County Blueprint Preferred Scenario



Source: Fresno Council of Governments (2009).

The Blueprint preferred scenario would result in a countywide average of 8.0 dwelling units/acre residential density for new growth between now and 2050. The density of new growth in the Fresno Clovis Metropolitan Areas (FCMA) will be 9.0 units/acre, while the average density of new development in the non-FCMA areas will be around 5.7 units/acre. This is comparable with the current trend density for Fresno county of 3.8 dwelling units/acre (Fresno COG 2009).

2.4.4 San Joaquin Valley Air Pollution Control District



The city of Fresno is within the San Joaquin Valley Air Basin, which is under the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD). The District has regulatory authority over certain stationary and industrial GHG emission sources and provides voluntary technical guidance on addressing GHGs for other emission sources in a CEQA context. District initiatives related to GHGs are described below.

2.4.4.1 Climate Change Action Plan

The District Governing Board approved the SJVAPCD Climate Change Action Plan (CCAP) on August 21, 2008. The CCAP began a public process to bring together stakeholders, land use agencies, environmental groups, and business groups, and to conduct public workshops to develop comprehensive policies for CEQA Guidelines, a carbon exchange bank, and voluntary GHG emissions mitigation agreements for the Governing Board's consideration. The CCAP contains the following goals and actions:

Goals.

1. Assist local land-use agencies with California Environmental Quality Act (CEQA) issues relative to projects with GHG emissions increases.
2. Assist Valley businesses in complying with mandates of AB 32 (Global Warming Solutions Act of 2006).
3. Ensure that climate protection measures do not cause increases in toxic or criteria pollutants that adversely impact public health or environmental justice communities.

Actions.

1. Develop GHG significance threshold(s) or other mechanisms to address CEQA projects with GHG emissions increases.
2. Develop necessary regulations and instruments for establishment and administration of the San Joaquin Valley Carbon Exchange Bank for voluntary GHG reductions created in the Valley.
3. Enhance the District's existing criteria pollutant emissions inventory reporting system to allow businesses subject to AB 32 emission reporting requirements to submit simultaneous streamlined reports to the District and the state of California with minimal duplication.
4. Develop and administer voluntary GHG emission reduction agreements to mitigate proposed GHG increases from new projects.

2.4.4.2 CEQA Greenhouse Gas Guidance

The District developed several resource documents that were used as guidance for developing the GHG Plan. The most important is the Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA, which is intended to assist local agencies in complying with CEQA and which contains a GHG threshold approach that has been widely accepted for use in the San Joaquin Valley and in other parts of the State. The District concluded that the existing science is inadequate to support quantification of the impacts that project-specific GHG emissions have on global climatic change. The District found that the effects of project-specific emissions to be cumulative, and without mitigation, their incremental contribution to global climatic change could be considered cumulatively considerable. The District found that this cumulative impact is best addressed by requiring all projects to reduce their GHG emissions, whether through project design elements or mitigation. Many San Joaquin Valley local jurisdictions, including Fresno, have used the District guidance for CEQA compliance.

The primary features of the District’s approach include:

- Projects exempt from the requirements of CEQA, and projects complying with an approved plan or mitigation program would be determined to have a less than significant cumulative impact. The GHG Plan is intended to meet the criteria as an approved plan or mitigation program.
- Projects for which there is no applicable approved plan or program, or those projects not complying with an approved plan or program, the lead agency would evaluate the project against a performance-based standards and would require the adoption of design elements, known as a Best Performance Standard, to reduce GHG emissions.
- Projects incorporating Best Performance Standards would not require specific quantification of GHG emissions, and automatically would be determined to have a less than significant cumulative impact for GHG emissions.

2.4.4.3 San Joaquin Valley Carbon Exchange and Rule 2301

The District initiated work on the San Joaquin Valley Carbon Exchange in November 2008. The Exchange was implemented with the adoption of Amendments to Rule 2301 Emission Reduction Credit Banking on January 19, 2012. The purpose of the carbon exchange is to quantify, verify, and track voluntary GHG emissions reductions generated within the San Joaquin Valley.

The District incorporated a method to register voluntary GHG emission reductions with amendments to Rule 2301. The purposes of the amendments to the rule include the following:

- Provide an administrative mechanism for sources to bank voluntary GHG emission reductions for later use.
- Provide an administrative mechanism for sources to transfer banked GHG emission reductions to others for any use.

- Define eligibility standards, quantitative procedures, and administrative practices to ensure that banked GHG emission reductions are real, permanent, quantifiable, surplus, and enforceable.

The District is participating in a new program developed by the California Air Pollution Control Officers Association (CAPCOA) to encourage banking and use of GHG reduction credits referred to as the CAPCOA Greenhouse Gas Reduction Exchange (GHGRx). The GHGRx provides information on GHG credit projects within participating air districts. The District is one of the first to have offsets available for trading on the Exchange.

2.4.4.4 Community Emissions Reductions Program: Assembly Bill 617 (AB 617)

AB 617 requires the CARB and air districts to develop and implement a Community Emission Reduction Plan (CERP) with additional emissions reporting, monitoring, and reduction plans and measures in an effort to reduce air pollution exposure in disadvantaged communities. Given that 20 of the 30 most disadvantaged communities in California are in the San Joaquin Valley, this process is expected to bring additional clean air resources and strategies to many Valley communities.

South Central Fresno and the City of Shafter are the first Valley communities selected by the California Air Resources Board for investment of additional resources under AB 617. The Valley Air District has established a steering committee for each of these communities comprising community residents, businesses, community advocates, and government representatives to assist in the development and implementation of community air monitoring and emission reduction programs.

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3.0 EMISSION INVENTORY

Emission inventories are compilations of emissions generated by sources in a geographic area at a given time. GHG emission inventories are reported in units of MT CO₂e emissions per year. Emission inventories identify the contribution of each type or category of emissions to the total inventory of pollutants of interest. Emission inventories help rank sources by size to determine those that are most important to control.

Inventories are required to determine existing conditions and to forecast emissions in future years to account for the effects of growth.

3.1 INVENTORY METHODS AND ASSUMPTIONS

3.1.1 Inventory Protocols

Emission inventory protocols have been developed for many emission sources by governmental and independent agencies, and professional associations. The U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, developed by ICLEI Local Governments for Sustainability, provides guidance for developing community inventories prepared in the United States. The U.S. Community Protocol is not entirely applicable to inventories in California communities. For some inventory categories, a more detailed inventory may be required to ensure its adequacy for use in a CEQA context. California specific emission factors and data are available for many sources that when used produce a more accurate inventory. The inventory prepared for the City of Fresno GHG Plan Update follows the U.S. Community Protocol as modified for use in California.

3.1.2 Baseline Inventory Source Categories

The City developed its year 2010 baseline GHG inventory, which included the following source sectors:

- Motor Vehicles
- Electricity Use (Residential and Commercial)
- Natural Gas Use (Residential and Commercial)
- Waste
- Off-Road Equipment
- Refrigerants

The inventory did not include sources that comprise less than 3 percent of the inventory and sources that are not within the control or influence of the City of Fresno. One exception is off-road equipment, which is less than 1 percent but is commonly included in project level GHG analyses. Large industrial sources of emissions that are subject to CARB's reporting regulation and Cap-and-Trade regulation were not included in the inventory. The inventory did not include impacts of upstream emissions (e.g., emissions associated with an extraction process for purchased fuels—extraction, production, and transportation of fuels) because those sources are not within the control or influence of the City.

3.2 BASELINE INVENTORY SELECTION CRITERIA

The baseline inventory year is important because it forms the starting point for setting emission reduction targets in future years. Several criteria were considered in selecting the best year for the baseline inventory, including:

- Data availability;
- Relationship with State inventories and targets; and
- Recommended practices from other agencies and organizations.

Since the AB 32 target is based on returning emissions to 1990 levels by 2020, some jurisdictions include a 1990 inventory. The 1990 baseline represents Statewide emissions and not the emissions of individual cities and counties. Growth rates vary widely from city to city since 1990. A 1990 inventory and target that do not account for variations in growth from community to community do not provide a valid comparison of the effectiveness or stringency of a GHG reduction program. In addition, the City cannot go back in time and change the amount and type of development that has occurred since 1990; it can only work from existing conditions. Therefore, the City had determined that a 2010 baseline provides the most recent year with complete data available suitable for describing existing conditions.

3.3 BASELINE INVENTORY

The City of Fresno baseline inventory year for the GHG Plan is 2010. The CARB has prepared an updated inventory for 2010 that accounts for regulations adopted to that point in time. Therefore, 2010 provides the best available baseline for the GHG Plan and can be compared directly with State progress to date and targets. Table 3-A shows the baseline inventory.

Table 3-A: GHG Emissions by Sector for 2010

Sector	2010 (MT CO ₂ e)	Percent of Total
Motor Vehicles	1,899,799	51
Electricity - Residential	327,813	9
Electricity - Commercial	361,836	10
Natural Gas - Residential	362,832	10
Natural Gas - Commercial	394,417	11
Waste	123,945	3
Off-road Equipment	1,051	<1
Ozone Depleting Substance (ODS) Substitutes	273,422	7
Total	3,745,115	100

Source: City of Fresno Greenhouse Gas Reduction Plan (2014).
MT CO₂e = metric tons of carbon dioxide equivalent

3.4 BASELINE INVENTORY UPDATE

In September 2018, ICLEI Local Governments for Sustainability developed an inventory update for the year of 2016 for the City through the Statewide Energy Efficiency Collaborative. This inventory update is more recent and captures the GHG reductions from Statewide and local measures since 2010, therefore better reflects the current GHG emission levels in the city. The inventory update has

different source categories than the 2010 baseline inventory. The 2016 inventory update includes Agriculture and Industrial Energy sectors, which are additional to the 2010 baseline inventory. Therefore, the 2016 inventory update is more complete. Table 3-B shows the source categories comparison between 2010 baseline inventory and 2016 inventory update.

Table 3-B: Source Categories Comparison Between 2010 and 2016 Inventories

2010 Baseline Inventory Sector	2016 Inventory Update Sector
Motor Vehicles	Transportation
Electricity - Residential	Residential Energy
Electricity - Commercial	Commercial Energy
Natural Gas - Residential	Residential Energy
Natural Gas - Commercial	Commercial Energy
Waste	Solid Waste
Off-road Equipment	Transportation
Ozone Depleting Substance (ODS) Substitutes	Fugitive Emissions
Not Included	Agriculture
Not Included	Industrial Energy

Source: Compiled by LSA Associates, Inc. (2019).

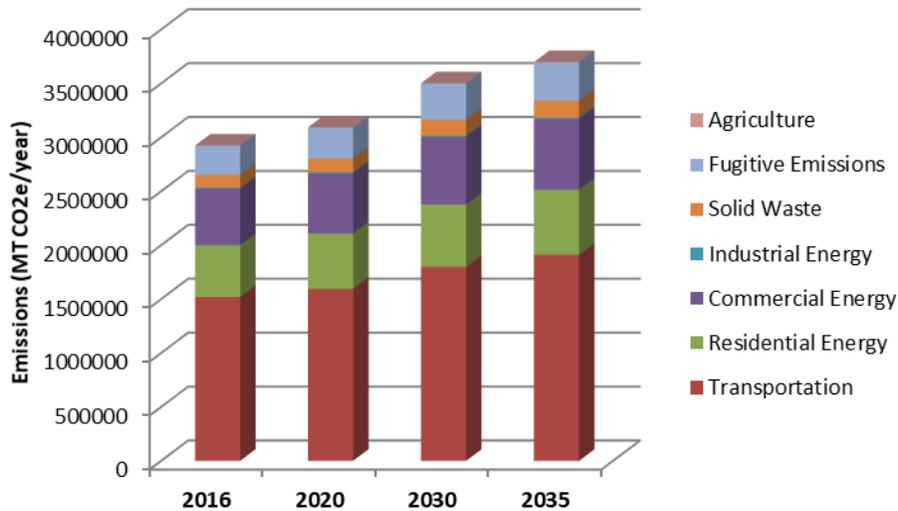
The City's total emissions in 2016 were 2,923,633 MT CO₂e. As shown in Table 3-C and Figure 3-1, the Transportation sector was the largest contributor to emissions in the 2016 inventory, with 52 percent of the City's total GHG emissions. Commercial and residential energy use were the second and third largest contributor of GHG emissions with 18 percent and 16 percent of total emissions, respectively. Fugitive emissions accounted for 9 percent of total emissions, solid waste accounted for 4 percent of total emissions, and industrial energy and agriculture sectors emitted less than 1 percent.

Table 3-C: City of Fresno 2016 Inventory Update and Business-as-Usual Projections

Sector	2016 (MT CO ₂ e)	Percent of Total	2020 (MT CO ₂ e)	Percent of Total	2030 (MT CO ₂ e)	Percent of Total	2035 (MT CO ₂ e)	Percent of Total
Transportation	1,520,052	52	1,594,888	52	1,798,498	51	1,909,852	52
Commercial Energy	524,838	18	557,142	18	627,373	18	657,379	18
Residential Energy	479,371	16	514,053	17	579,546	17	603,951	16
Fugitive Emissions	270,130	9	288,573	9	335,316	10	357,008	10
Solid Waste	119,167	4	127,303	4	147,923	4	157,493	4
Industrial Energy	10,055	<1%	10,506	<1%	11,528	<1%	12,035	<1%
Agriculture Energy	20	<1%	20	<1%	20	<1%	20	<1%
Total	2,923,633	100	3,092,486	100	3,500,204	100	3,697,738	100

Source: ICLEI Local Governments for Sustainability, City of Fresno 2016 Inventory Update, 2018. Compiled by LSA Associates, Inc.
MT CO₂e = metric tons of carbon dioxide equivalent

Figure 3-1: City of Fresno 2016 Inventory Update and Business-as-Usual Projections



Source: Compiled by LSA Associates, Inc. (2019).

3.5 INVENTORY PROJECTIONS

The GHG Plan includes inventory projections for 2020, 2030, and 2035. The 2020 and 2030 forecast years are consistent with the goals identified in AB 32 and the 2017 Scoping Plan, which identify Statewide GHG reduction targets by 2020 and 2030. The 2035 forecast year correspond to the General Plan horizon and will allow the City to develop long-term strategies to continue GHG reductions.

3.5.1 BAU Inventory

BAU scenarios are commonly used in climate action planning to ensure that control measures are adequate to overcome the effects of cumulative growth in emissions by a target year. BAU is defined in the CARB AB 32 Scoping Plan as the forecasted GHG emissions through 2030 with existing policies and programs, but without any further action to reduce GHGs. BAU inventories allow for separate accounting of the benefits of regulations, strategies, and programs on future emissions.

The City’s BAU GHG emissions for 2020, 2030, and 2035 were projected based on 2016 Inventory Update data using population, households, and employment growth rate from the Fresno County 2050 Growth Projections developed by Fresno County Council of Governments.⁹ The BAU inventory for each forecast year is provided in Table 3-C and Figure 3-1.

⁹ Applied Development Economics. 2017. Fresno County 2050 Growth Projections. Prepared for Fresno County Council of Governments. Website: www.fresnocog.org/wp-content/uploads/publications/Demographics/Fresno_COG_2050_Projections_Final_Report_050417.pdf (accessed March 4, 2019).

The BAU inventories presented above show that in the absence of regulations and other measures to reduce GHG emissions, the City's BAU emissions in 2020 are estimated to be 3,092,486 MT CO₂e, or a 5.8 percent increase from 2016 emissions. By 2030, emissions are estimated to increase 19.7 percent from the 2016 level to 3,500,204 MT CO₂e. By 2035, emissions are estimated to increase 26.5 percent from the 2016 level to 3,697,738 MT CO₂e.

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4.0 REDUCTIONS FROM STATE REGULATIONS

The State has enacted many regulations pursuant to the requirements in AB 32 that would reduce emissions within the city. The State's strategy is detailed in the Climate Change Scoping Plan adopted by the CARB in November 2017. Scoping Plan strategies are primarily implemented through the adoption of regulations. The most important and applicable strategies from the previous iterations and most recent 2017 Scoping Plan are discussed below.

4.1 MOTOR VEHICLES

The CARB has adopted many Scoping Plan measures for mobile sources as regulations both in the previous versions and most recent Scoping Plan (CARB 2008, 2014 and 2017). Only the measures that have been adopted or put into practice are included in this assessment. The following regulations are included:

- **Pavley and Low Carbon Fuel Standard:** EMFAC2017 emission factors that include Pavley and the LCFS were used to estimate the impact of those regulations. In this way, the reductions from those measures are more specific than simply applying the statewide reduction estimates because the reductions in EMFAC take into account the variations between vehicle classes and region.
- **Low Emission Vehicle (LEV) III Standards:** The LEV III standards amend the exhaust and evaporative emission standards for passenger cars and light- and medium-duty trucks. The standards provide requirements for model years 2017 to 2025. The regulation applies to both criteria pollutant and GHG emissions. The standard drops GHG emission to 166 grams per mile, a reduction of 34 percent compared with 2016 levels. LEV III implements the Pavley II standards described in the Scoping Plan.
- **Tire Pressure Program:** This regulation is categorized under vehicle efficiency measures in the Scoping Plan. This regulation applies to automotive service providers performing or offering to perform automotive maintenance or repair services in California. This applies to passenger cars, light-duty trucks, medium-duty vehicles, and light heavy-duty trucks with gross vehicle weight ratings of less than or equal to 10,000 pounds (CARB 2010). This measure is anticipated to reduce emissions by 0.5 percent for those vehicle types.
- **Low Friction Oil:** CARB indicates that this measure has been achieved in practice. It is assumed that this measure would apply to the same vehicle types as in the tire pressure program. This measure is anticipated to reduce emissions by 2.2 percent.
- **Aerodynamic Efficiency:** This regulation improves the fuel efficiency of heavy-duty tractors that pull 53-foot or longer box-type trailers. Fuel efficiency is improved through improvements in tractor and trailer aerodynamics and the use of low rolling-resistance tires. This measure would reduce emissions by 2.1 percent from heavy-duty vehicles.

4.2 ENERGY

The State's strategy for reducing energy-related GHGs targets electric power utilities on the production side and energy efficiency on the consumer side. Two regulations are in place to reduce emissions from this source. The Renewable Portfolio Standard requires electric utilities to provide an increasing share of their energy from renewable sources with 33 percent by 2020, 60 percent by 2030, and 100 percent by 2045. Title 24 Energy Efficiency Standards for Residential and Non-Residential Buildings requires new structures to meet increasingly stringent energy efficiency standards. California's Green Building Code mandates increased water conservation that results in less electricity consumed to pump and transport water.

4.2.1 Renewable Portfolio Standard (RPS)

The electricity emission factor was decreased to account for the renewable energy regulations, which require 33 percent renewable energy by the year 2020, 60 percent by 2030, and 73 percent by 2035, which is interpolated from the 100 percent by 2045 requirement. The average renewable energy use for 2005-2009 for PG&E was calculated as 12.6 percent (California Public Utilities Commission 2013). Based on an approximation of electric generation from RPS-eligible sources divided by forecasted electricity retail sales for the year 2018, the Energy Commission estimates that 34 percent of California's retail electricity sales in 2018 will be provided by RPS-eligible renewable resources. This shows that the State is already ahead of its 2020 goal (CEC 2018).

4.2.2 Title 24, Part 6 Building Energy Efficiency Standards

Building energy efficiency standards are designed to ensure that new and existing buildings achieve energy efficiency and preserve outdoor and indoor environmental quality. These standards are contained in the California Code of Regulations (CCR) Title 24, Part 6. The California Energy Commission (CEC) is required by State law to update energy efficiency standards every 3 years. The 2019 Standards, which will become effective in January 2020, are focused on achieving zero net energy (ZNE) homes by increasing energy efficiency and requiring solar photovoltaic (PV) systems for new homes (CEC 2019).

The reductions from Title 24 are applied to the energy consumption related emissions for new development and remodeling projects at existing buildings subject to the regulations. The benefits of the standards accrue as buildings subject to the standards are constructed to meet the standard applicable at the time. PG&E provided actual electricity and natural gas usage for 2008 through 2010, which reflect the benefits of all development subject to previous versions of the Title 24 standards. New development would provide additional reductions as buildings are constructed to comply with the latest standards.

4.2.3 California's Green Building Standard Code

CCR Title 24, Part 11 (California Green Building Standard Code [CALGreen]), was adopted on January 12, 2010. The State Building Standards Commission unanimously adopted updates to the California Green Building Standards Code, which went into effect on January 1, 2011. The Code is a comprehensive and uniform regulatory code for all residential, commercial, and school Buildings. Further updates to CALGreen went into effect on January 1, 2017. CALGreen is the first Statewide

mandatory green building code and significantly raises the minimum environmental standards for construction of new buildings in California. The mandatory provisions in CALGreen will reduce the use of VOC-emitting materials, will strengthen water conservation, and will require construction waste recycling.

4.3 REFRIGERANTS

The State has adopted several refrigerant management regulations that are anticipated to achieve substantial reductions. For example, CARB predicts that the regulations that will apply to large commercial refrigeration units will reduce emissions by more than 50 percent.

4.4 REDUCTIONS FROM STATE REGULATIONS

The predicted reduction in emissions from State measures on city of Fresno emissions is shown in Table 4-A.

Table 4-A: Reductions from Statewide Measures

Sector	State Measures	Emission Reductions (MT CO ₂ e/year)		
		2020	2030	2035
Transportation	Pavley and Low Carbon Fuel Standard; Low Emission Vehicle Program III; Tire Tread Program; Tire Pressure Program; Low Friction Oil; HD Aerodynamic/MHD Hybridization	424,559	667,463	836,897
Residential Energy	Renewable Portfolio Standards	164,477	299,049	363,843
	Title 24 – Electricity	16,833	79,525	102,708
	Title 24 – Natural Gas	7,983	10,762	12,496
Commercial Energy	Renewable Portfolio Standards	174,877	317,958	386,849
	Title 24 – Electricity	9,614	5,532	4,196
	Title 24 – Natural Gas	17,530	12,933	11,108
Fugitive Emissions	Limit High GWP Use in Consumer Products; Motor Vehicle Air Conditioning; High GWP Refrigerant Management Program for Stationary Sources	144,287	167,658	178,504
Total		960,160	1,560,880	1,896,602

Source: Compiled by LSA Associates, Inc. (2019).

GWP = global warming potential

HD = Heavy Duty

MHD = Medium Heavy Duty

MT CO₂e/year = metric tons of carbon dioxide equivalent per year

4.4.1 Adjusted Business-as-Usual

The adjusted business-as-usual (ABAU) inventory applies emission reductions achieved by Statewide regulations, programs, and measures. This inventory identifies the base from which reductions are needed from local strategies and measures to demonstrate consistency with the State-aligned targets. Table 4-B shows the emission inventories for each year after the application of State regulatory measures.

Table 4-B: City of Fresno Adjusted Business-as-Usual Emissions

Sector	2016	2020	2030	2035
Transportation	1,520,052	1,170,329	1,131,034	1,072,955
Commercial Energy	524,838	355,121	290,950	255,226
Residential Energy	479,371	324,760	190,210	124,904
Fugitive Emissions	270,130	144,287	167,658	178,504
Solid Waste	119,167	127,303	147,923	157,493
Industrial Energy	10,055	10,506	11,528	12,035
Agriculture Energy	20	20	20	20
Total	2,923,633	2,132,326	1,939,325	1,801,137

Source: Compiled by LSA Associates, Inc. (2019).

4.4.2 Target Analysis

The State has set goals for reducing GHG emissions by 2020, 2030, and 2050 through AB 32, SB 32, and EO B-30-15, respectively. The State has also provided guidance to local jurisdictions as “essential partners” in achieving the State’s goals by identifying a 2020 recommended reduction goal. That goal, stated in the AB 32 Scoping Plan, was for local governments to achieve a 15 percent reduction below baseline levels by 2020, which aligns with the State’s goal of not exceeding 1990 emissions levels by 2020. The State’s long-term target is to emit no more than 20 percent of 1990 levels by 2050 (or, a reduction of 80 percent below 1990 levels by 2050). The State has also provided an interim target, which is 40 percent below 1990 levels by 2030. It is clear that the issue of climate change will not end in 2030 and continued reduction goals should be implemented to keep the State on a path toward the 2050 goal. A straight-line projection from the 2030 to 2050 goals would result in a reduction goal of 58 percent below baseline levels by 2035.

In order to keep the City of Fresno GHG Reduction Plan in line with the State’s reduction goals, the targets, as shown in Table 4-C, have been identified. Based on these targets, the City would meet the reduction target from an ABAU forecast in 2020. In 2030 and 2035, the City would need to reduce 29,316 MT CO₂e and 209,463 MT CO₂e emissions below the ABAU scenario, respectively, to meet the State-aligned target (Table 4-C and Figure 4-1).

Table 4-C: State-Aligned GHG Emission Reduction Targets By Year

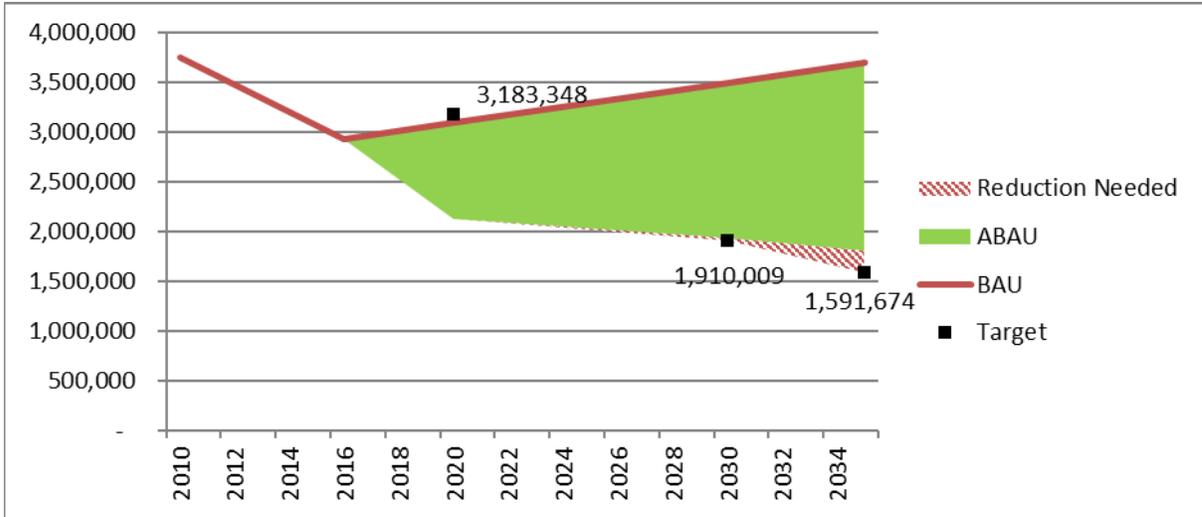
Sector	2010 ¹	2016	2020	2030	2035
BAU Emissions (MT CO ₂ e)	3,745,115	2,923,633	3,092,486	3,500,204	3,697,738
Adjusted BAU Emissions (MT CO ₂ e)	3,745,115	2,923,633	2,132,326	1,939,325	1,801,137
State-Aligned Target (Percent change from 1990)			0	-40	-50
State-Aligned Target (Percent change from 2010)			-15	-49	-58
State-Aligned Emissions Goal (MT CO ₂ e)			3,183,348	1,910,009	1,591,674
Reductions from Adjusted BAU needed to meet the State-Aligned Target (MT CO ₂ e)			Target Met	29,316	209,463

Source: Compiled by LSA Associates, Inc. (2019).

¹ Baseline (2010) emissions are from the City’s 2014 GHG Reduction Plan.

BAU = business-as-usual GHG = greenhouse gas MT CO₂e = metric tons of carbon dioxide equivalent

Figure 4-1: City of Fresno GHG Emissions Inventory, Forecast, and Targets



Source: Compiled by LSA Associates, Inc. (2019).

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5.0 GREENHOUSE GAS REDUCTION STRATEGY

The GHG Reduction Plan is a comprehensive vision of the City’s plan to reduce GHG emissions. The City is already on a path toward lower emissions through its prior actions. The City has adopted a several goals, policies, and programs from the General Plan that contributed towards reducing GHG emissions. The General Plan provides a comprehensive strategy to reduce GHG emissions from all sources within the City’s ability to control or influence. The strategies enhance the effectiveness of State strategies by ensuring that the city is developed in ways that minimize emissions and by application to City-owned facilities. The relevant General Plan objectives and policies are listed throughout the following section. For convenience, a compilation of the General Plan objectives and policies is provided as Appendix A to this GHG Plan Update. Table 5-A provides a listing of General Plan Elements/Chapters and the associated letter designations to enable the reader to identify the General Plan Element/Chapter associated with the objectives and policies listed in this section.

Table 5-A: General Plan Chapter Cross Reference

General Plan Element and Chapter	Policy Prefix
Urban Form (Chapter 3)	UF
Land Use (Chapter 3)	LU
Design (Chapter 3)	D
Mobility and Transportation (Chapter 4)	MT
Park and Open Space (Chapter 5)	POSS
Public Utilities and Services (Chapter 6)	PU
Resource Conservation and Resilience (Chapter 7)	RC
Healthy Communities (Chapter 10)	HC
Economic Development and Fiscal Sustainability (Chapter 2)	ED

Source: FirstCarbon Solutions. 2014. Fresno General Plan Update, Greenhouse Gas Reduction Plan, prepared for the City of Fresno. July. Website: <https://www.fresno.gov/darm/wp-content/uploads/sites/10/2016/11/F-2-Greenhouse-Gas-Reduction-Plan.pdf> (accessed December 2019).

5.1 GHG PLAN REDUCTION STRATEGY

The City can control or influence GHG emissions in several ways. The City has direct control over its own fleet vehicles and buildings where it can use its budgeting authority and purchasing decisions for high efficiency/low emission options. The City has influence over emissions from development and redevelopment projects through its land use authority and its responsibilities as a Lead Agency under CEQA. The City can also provide leadership and education to the community to encourage voluntary actions to reduce GHG emissions. The General Plan provides the comprehensive objectives and policies that direct development in the city. The GHG Plan Update relies upon the General Plan as the basis of the development related strategies to reduce GHG emissions.

Greenhouse gas emissions are generated by a multitude of sources and activities. There is no single technology or individual program that provides a silver bullet for addressing this problem. Comprehensive solutions on multiple fronts are required to make the progress needed to achieve reduction targets for 2020, 2030 and beyond.

The GHG Plan Update strategies are categorized as follows:

- Land Use and Transportation
- Transportation Facilities Strategies
- Transportation Demand Strategies
- Energy Conservation Strategies for New and Existing Buildings
- Water Conservation Strategies
- Waste Diversion and Recycling and Energy Recovery
- Strategies for Existing Development
- Municipal Strategies



As described in the previous section, motor vehicle emissions dominate the City's emission inventory. The City has control over the emissions from its government fleet vehicles through its purchasing decisions, but no control over the emissions from other vehicles that operate in and pass through the city. However, the City's authority over land use provides opportunities to influence the amount people drive and their choice of travel mode. In planning circles, this is called the land use, transportation, air quality connection.

Land use and transportation strategies are supported by the General Plan land use and circulation plans and policies that provide the City's vision of future development in the planning area to the extent that they reduce vehicle trips and miles traveled compared with alternative development plans and patterns. The City's General Plan includes many land use and transportation policies that when implemented result in lower greenhouse gas emissions through the promotion of smart growth; jobs/housing balance; transit-oriented development; and infill development through that application of land use designations, and zoning, and the use of public-private partnerships to encourage action.

The following are land use strategies utilizing goals and policies in the General Plan that with application to individual projects will achieve GHG emission reductions. Key GHG Plan Update indicators associated with the applicable General Plan policies are also identified to help the individual projects account for GHG emission reductions.

5.1.1 Land Use Strategies

Development that is more dense and compact places people closer to destinations that can be accessed by walking or bicycling, and transit. Higher densities near transit routes and facilities also increases the potential for more frequent high-quality transit service such as BRT. The General Plan includes the following related policy.

Policy RC-2-a Link Land Use to Transportation. Promote mixed-use, higher density infill development in multi-modal corridors. Support land use patterns that make more efficient use of the transportation system and plan future transportation investments in areas of higher-intensity development. Discourage investment in infrastructure that would not meet these criteria.

5.1.1.1 Compact and Infill Development

The General Plan provides for a substantial increase in development density in new growth areas compared to existing development. In addition, development trends show that more project developers can be expected to propose higher-density, single- and multi-family development than was constructed in the past. The General Plan land use designations provide density ranges that allow for higher average densities than experienced in the past for land already designated by the General Plan. The General Plan provide an increase in density in new growth areas.



Higher-density development tends to produce fewer vehicle trips per dwelling unit and more intense commercial development increases opportunities for walking, bicycling, and transit use for some trips. Although higher density is a prerequisite for achieving compact development, the design of the new projects is critical for maximizing reductions from being more compact related to walking, bicycling, and transit use. Approved but undeveloped subdivisions would comply with existing General Plan designations; however, market forces could result in requests for revisions to these subdivisions that would increase development density. Another way to increase density is to allow second units on residential lots. This practice increases overall development density and promotes more compact development that brings more people closer to commercial development.

Relevant General Plan Policies.

- Policy UF-1-c** **Identifiable City Structure.** Focus integrated and ongoing planning efforts to achieve an identifiable city structure, comprised of a concentration of buildings, people, and pedestrian-oriented activity in Downtown; along a small number of transit-oriented, mixed-use corridors and strategically located Activity Centers; and in existing and new neighborhoods augmented with parks and connected by multi-purpose trails and tree-lined bike lanes and streets.
- Objective UF-12** Locate roughly one-half of future residential development in infill areas—defined as being within the City on December 31, 2012—including the Downtown core area and surrounding neighborhoods, mixed-use centers and transit-oriented development along major BRT corridors, and other non-corridor infill areas, and vacant land.
- Policy UF-12-b** **Activity Centers.** Mixed-use designated areas along BRT and/or transit corridors are appropriate for more intensive concentrations of urban uses. Typical uses could include commercial areas; employment centers; schools; compact residential development; religious institutions; parks; and other gathering points where residents may interact, work, and obtain goods and services in the same place.

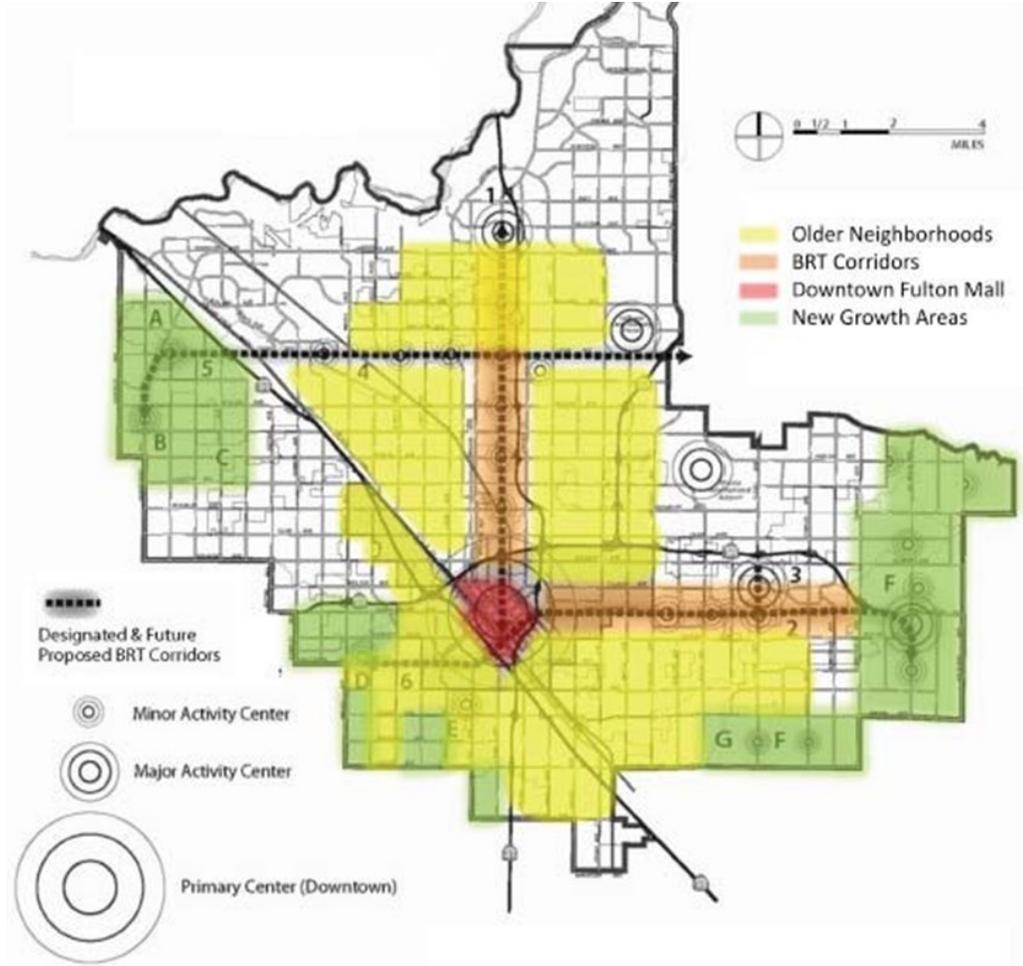
- Policy LU-2-a** **Infill Development and Redevelopment.** Promote development of vacant, underdeveloped, and redevelopable land within the City Limits where urban services are available by considering the establishment and implementation of supportive regulations and programs.
- Policy LU-2-b** **Infill Development for Affordable Housing.** Establish a priority infill incentive program for residential infill development of existing vacant lots and underutilized sites within the City as a strategy to help to meet the affordable housing needs of the community.
- Policy LU-3-b** **Mixed-Use Urban Corridors that Connect the Downtown Planning Area.** Support the development of mixed-use urban corridors that connect the Downtown Planning Area with the greater Fresno-Clovis Metropolitan Area with functional, enduring, and desirable urban qualities along the Blackstone Avenue, Shaw Avenue, California Avenue, and Ventura Avenue/Kings Canyon corridors, as shown on Figure LU-1: General Plan Land Use Diagram.
- Policy LU-3-c** **Zoning for High Density on Major BRT Corridors.** Encourage adoption of supportive zoning regulations for compact development along BRT corridors leading to the Downtown Core that will not diminish long-term growth and development potential for Downtown.
- Policy LU-5-f** **High Density Residential Uses.** Promote high-density residential uses to support Activity Centers and BRT corridors, and walkable access to transit stops.
- Policy RC-2-a** **Link Land Use to Transportation.** Promote mixed-use, higher density infill development in multi-modal corridors. Support land use patterns that make more efficient use of the transportation system and plan future transportation investments in areas of higher-intensity development. Discourage investment in infrastructure that would not meet these criteria.

Figure 5-1 illustrates the conceptual location for the city of Fresno growth areas and the proposed BRT corridor. Compact development and infill provide the supporting base that maximizes the potential reductions in GHG emissions from the Plan strategy. Increased density, strategically located near quality transit and activity centers, is critical to successful implementation.

Key GHG Plan Indicators.

- Change in development density with time.
- Number of infill and redevelopment projects proposed.
- Changes in transit service and ridership.
- Compile ongoing development statistics for comparison with General Plan Policy objectives.
- Projects comply with General Plan policies.

Figure 5-1: City of Fresno Growth Areas and Proposed BRT Corridors



Source: City of Fresno (2019).

5.1.1.2 Mixed-Use Development

Mixed-use projects provide opportunities for walking between uses for some trips. Trips are reduced when visitors can park once at the development and obtain services, shopping, or go to a restaurant during a single trip. There are a variety of mixed-use development types with different mixes of uses and designs. Infill projects that provide residential development close to existing commercial development or vice versa can produce many of the same mixed-use benefits if done in a walkable environment.



Relevant General Plan Policies.

- Policy RC-2-a** **Link Land Use to Transportation.** Promote mixed-use, higher density infill development in multi-modal corridors. Support land use patterns that make more efficient use of the transportation system and plan future transportation investments in areas of higher-intensity development. Discourage investment in infrastructure that would not meet these criteria.
- Policy RC-2-b** **Provide Infrastructure for Mixed-Use and Infill.** Promote investment in the public infrastructure needed to allow mixed-use and denser infill development to occur in targeted locations, such as expanded water and wastewater conveyance systems, complete streetscapes, parks and open space amenities, and trails. Discourage investment in infrastructure that would not meet these criteria.
- Policy UF-12-d** **Appropriate Mixed-Use.** Facilitate the development of vertical and horizontal mixed-uses to blend residential, commercial, and public land uses on one or adjacent sites. Ensure land use compatibility between mixed-use districts in Activity Centers and the surrounding residential neighborhoods.
- Policy UF-12-f** **Mixed-Use in Activity Centers.** Update the Development Code which includes use regulations and standards to allow for mixed uses and shared parking facilities.

Key GHG Plan Indicators.

- The number of mixed use projects proposed.
- The number of mixed use project constructed.

5.1.1.3 Pedestrian-Oriented Development

Providing pedestrian-friendly infrastructure such as sidewalks, paths, and direct connections to neighboring uses such as shopping, schools, libraries, and parks increase the potential for people to make trips on foot instead of making a car trip.

This strategy is consistent with the Complete Streets concept that aims to make streets safe for walking and bicycling.



Relevant General Plan Policies.

- Policy UF-12-e** **Access to Activity Centers.** Promote adoption and implementation of standards supporting pedestrian activities and bicycle linkages from surrounding land uses and neighborhoods into Activity Centers and to transit stops. Provide for priority transit routes and facilities to serve the Activity Centers.

- Policy UF-12-f** **Mixed-Use in Activity Centers.** Update the Development Code which includes use regulations and standards to allow for mixed uses and shared parking facilities.
- Objective UF-14** Create an urban form to facilitate multi-modal connectivity.
- Policy UF-14-a** **Design Guidelines for Walkability.** Develop and use design guidelines and standards for a walkable and pedestrian-scaled environment with a network of streets and connections for pedestrians and bicyclists, as well as transit and autos.
- Policy UF-14-b** **Local Street Connectivity.** Design local roadways to connect throughout neighborhoods and large private developments with adjacent major roadways and pathways of existing adjacent development. Create access for pedestrians and bicycles where a local street must dead end or be designed as a cul-de-sac to adjoining uses that provide services, shopping, and connecting pathways for access to the greater community area.
- Policy UF-14-c** **Block Length.** Create development standards that provide desired and maximum block lengths in residential, retail, and mixed-use districts in order to enhance walkability.
- Policy D-3-c** **Local Streets as Urban Parkway.** Develop local streets as “urban parkways”, where appropriate, with landscaping and pedestrian spaces.
- Policy D-4-b** **Incentives for Pedestrian-Oriented Anchor Retail.** Consider adopting and implementing incentives for new pedestrian-friendly anchor retail at intersections within Activity Centers and along corridors to attract retail clientele and maximize foot traffic.
- Policy MT-1-h** **Update Standards for Complete Streets.** Update the City’s Engineering and Street Design Standards to ensure that roadway and streetscape design specifications reflect the Complete Streets concept, while also addressing the needs of through traffic, transit stops, bus turnouts, passenger loading needs, bike lanes, pedestrian accommodation, and short- and long-term parking.

Key GHG Plan Indicators.

- Project compliance with General Plan Policies

5.1.1.4 Transit-Oriented Development

Long-term development trends for increasing density and mixes of uses can lead to improved transit service in key areas of Fresno over time. Higher densities when combined with pedestrian orientation encourage transit use. A key factor is that both ends of the transit trip must be walkable and have the potential to serve reasonably large numbers of transit riders. The City’s existing BRT

system combined with plans to increase development densities at BRT stations and along the corridor are critical elements of the City’s transit oriented development strategy.

Relevant General Plan Policies.

Objective UF-12 Locate roughly one-half of future residential development in infill areas—defined as being within the City on December 31, 2012—including the Downtown core area and surrounding neighborhoods, mixed-use centers and transit-oriented development along major BRT corridors, and other non-corridor infill areas, and vacant land.

Policy UF-12-a **BRT Corridors.** Design land uses and integrate development site plans along BRT corridors, with transit-oriented development that supports transit ridership and convenient pedestrian access to bus stops and BRT station stops.

Policy UF-12-b **Activity Centers.** Mixed-use designated areas along BRT and/or transit corridors are appropriate for more intensive concentrations of urban uses. Typical uses could include commercial areas; employment centers; schools; compact residential development; religious institutions; parks; and other gathering points where residents may interact, work, and obtain goods and services in the same place.

Key GHG Plan Indicators.

- Comparison of development approved in infill areas versus non-infill areas such as comparison of development approved within 0.5 mile of BRT stations and 0.25 mile of transit stations versus non-BRT/non-transit station areas.
- Project designs consistent with General Plan policies.

5.1.2 Transportation Facilities Strategies

The following are strategies related to transportation infrastructure and facilities that encourage the use of alternative modes of transportation such as walking, bicycling, and transit use. This strategy would be implemented through support for and funding of transit, bicycle, and pedestrian connections, through transit and trail planning, and with regional cooperation among relevant agencies.

5.1.2.1 Transit Facilities

Transit facilities include bus stops, bus turnouts, multimodal transfer centers, and information kiosks. These facilities increase the comfort and convenience of using transit and minimize impacts on traffic flow from buses stopping for riders and re-entering traffic. Overall increases in transit service through the addition of new buses, new routes, and more frequent stops can also provide increased transit mode share. Transit



facility improvements are often provided by development projects in new growth areas as conditions of approval and mitigation measures. The improvements can also be provided as retrofits on existing streets and upgrades to existing transit stops using transportation funding.

Relevant General Plan Policies.

- Objective MT-8** Provide public transit options that serve existing and future concentrations of residences, employment, recreation and civic uses and are feasible, efficient, safe, and minimize environmental impacts.
- Policy MT-8-a** **Street Design Coordinated with Transit.** Coordinate the planning, design, and construction of the major roadway network with transit operators to facilitate efficient direct transit routing throughout the Planning Area.
- Policy MT-8-b** **Transit Serving Residential and Employment Nodes.** Identify the location of current and future residential and employment concentrations and Activity Centers throughout the transit service area in order to facilitate planning and implementation of optimal transit services for these uses. Work with California State University, Fresno to determine locations within the campus core for bus stops.
- Policy MT-8-g** **High Speed Train.** If the State moves forward with HST, ensure it is constructed through Fresno in a manner that minimizes impacts to surrounding property owners and creates the most opportunity for redevelopment around the HST station.
- Objective MT-9** Provide public transit opportunities to the maximum number and diversity of people practicable in balance with providing service that is high in quality, convenient, frequent, reliable, cost effective, and financially feasible.

Key GHG Plan Indicators.

- Transit route expansions
- Transit ridership trends
- Transition toward zero emission vehicles

5.1.2.2 Bicycle and Pedestrian Infrastructure



Adequate pedestrian infrastructure connecting frequently accessed destinations is critical to an increase in walking trips. Pedestrian infrastructure should be incorporated into project designs for new development, but also can be retrofitted in existing neighborhoods with barriers to walking such as lack of sidewalks or dangerous crossings.

Bicycle infrastructure including separate bicycle paths and bicycle lanes on roadways can increase the safety of cyclists and

encourage the use of this travel mode. Bicycle paths designed to provide more direct connections shorten travel distances and maximize safety. Bicycle lanes are less costly and can more easily connect multiple destinations for cyclists. The City of Fresno has an aggressive program in place to construct bike lanes and paths throughout the city. All new development is required to comply with the Bicycle, Pedestrian, and Trails Master Plan. Most arterials are now equipped with striped bike lanes. The City has also been installing sensors in the bike lanes that will trigger traffic lights to change when no motor vehicles are present.



Relevant General Plan Policies.

- Objective MT-4** Establish and maintain a continuous, safe, and easily accessible bikeways system throughout the metropolitan area to reduce vehicle use, improve air quality and the quality of life, and provide public health benefits.
- Policy MT-4-a** **Active Transportation Plan.** To the extent consistent with this General Plan, continue to implement and periodically update the Active Transportation Plan to meet State standards and requirements for recommended improvements and funding proposals as determined appropriate and feasible.
- Policy MT-4-b** **Bikeway Improvements.** Establish and implement property development standards to assure that projects adjacent to designated bikeways provide adequate right-of-way and that necessary improvements are constructed to implement the planned bikeway system shown on Figure MT-2 to provide for bikeways, to the extent feasible, when existing roadways are reconstructed; and alternative bikeway alignments or routes where inadequate right-of-way is available.
- Policy MT-4-c** **Bikeway Linkages.** Provide linkages between bikeways, trails and paths, and other regional networks such as the San Joaquin River Trail and adjacent jurisdiction bicycle systems wherever possible.
- Objective MT-5** Establish a well-integrated network of pedestrian facilities to accommodate safe, convenient, practical, and inviting travel by walking, including for those with physical mobility and vision impairments.
- Policy MT-5-a** **Sidewalk Development.** Pursue funding and implement standards for development of sidewalks on public streets, with priority given to meeting the needs of persons with physical and vision limitations; providing safe routes to school; completing pedestrian improvements in established neighborhoods with lower vehicle ownership rates; or providing pedestrian access to public transportation routes.

- Objective MT-6** Establish a network of multi-purpose pedestrian and bicycle paths, as well as limited access trails, to link residential areas to local and regional open spaces and recreation areas and urban Activity Centers in order to enhance Fresno’s recreational amenities and alternative transportation options.
- Policy MT-6-a** **Link Residences to Destinations.** Design a pedestrian and bicycle path network that links residential areas with Activity Centers, such as parks and recreational facilities, educational institutions, employment centers, cultural sites, and other focal points of the city environment.
- Policy MT-6-g** **Path and Trail Development.** Require all projects to incorporate planned multi-purpose path and trail development standards and corridor linkages consistent with the General Plan, applicable law and case-by-case determinations as a condition of project approval.
- Policy POSS-7-h** **Interlink City and San Joaquin River Parkway Trail Networks.** Strive to connect the parkway trail network to other trails in the vicinity, in order to create a community and regional trail system that offers a variety of different route combinations and enhances public access to the parkway.

Key GHG Plan Indicators.

- Active Transportation Plan implementation progress (projects funded and constructed).
- Developer funded and constructed bicycle and pedestrian projects.
- Compliance with General Plan policies and Development Code.

5.1.2.3 Traffic Calming Features

Design features and strategies to reduce vehicle speeds and reduce conflicts with pedestrians encourage more walking. Slower speeds encouraged by traffic calming can also improve safety and increase bicycling. Providing on-street parking, or street trees and landscaping to separate vehicles from pedestrians improve walkability.



Relevant General Plan Policies.

- Policy MT-1-i** **Local Street Standards.** Establish and implement local roadway standards addressing characteristics such as alignment, width, continuity and traffic calming, to provide efficient neighborhood circulation; to allow convenient access by residents, visitors, and public service and safety providers; and to promote neighborhood integrity and desired quality of life by limiting intrusive pass-through traffic.
- Policy MT-1-j** **Transportation Improvements Consistent with Community Character.** Prioritize transportation improvements that are consistent with the character of surrounding neighborhoods and supportive of safe, functional and Complete

Neighborhoods; minimize negative impacts upon sensitive land uses such as residences, hospitals, schools, natural habitats, open space areas, and historic and cultural resources.

In implementing this policy, the City will design improvements to:

- Facilitate provision of multi-modal transportation opportunities;
- Provide added safety, including appropriate traffic calming measures;
- Promote achievement of air quality standards;
- Provide capacity in a cost effective manner; and
- Create improved and equitable access with increased efficiency and connectivity.

Policy MT-5-e Traffic Management in Established Neighborhoods. Establish acceptable design and improvement standards and provide traffic planning assistance to established neighborhoods to identify practical traffic management and calming methods to enhance the pedestrian environment with costs equitably assigned to properties receiving the benefits or generating excessive vehicle traffic.

Key GHG Plan Indicators.

- Project compliance with General Plan Policies

5.1.3 Transportation Demand Strategies

These strategies provide programs and facilities that encourage employees to use alternative modes for commute trips.

5.1.3.1 Transportation Demand Management

Transportation Demand Management (TDM) refers to measures designed to reduce the demand for transportation facilities that are usually implemented at employment sites and event centers. These include programs targeting employee commute trips at the worksite such as vanpools, and incentives for alternative transportation and government-operated programs such as rideshare matching and outreach and incentives. Event center TDM measures involve the use of shuttles, encouraging carpooling, and staggering arrival and departure times to reduce congestion.

Large existing and new employers are required by existing regulations to implement TDM programs. The SJVAPCD has adopted Rule 9410 Employer Based Trip Reduction, which requires employers with over 100 employees to implement trip reduction programs. (SJVAPCD 2009) The rule targets employee commute trips and requires large employers to implement measures that reduce VMT by increasing transit use, carpooling, vanpooling, bicycling, or other measures to reduce trips. The SJVAPCD estimates that the rule will reduce light-duty mobile source criteria pollutants by approximately 6.8 percent by 2023 (SJVAPCD 2009). Similar reductions in greenhouse gas emissions would also be achieved with the reduction in trips and vehicle miles traveled from the rule.

End-of-trip facilities include items such as showers and lockers for people who bicycle to work, secure bike parking, onsite services such as dry cleaning pick-up and cafeterias, and break rooms to reduce trips for errands and lunch. These are measures intended to increase the convenience and reduce potential negatives associated with bicycling to work and to eliminate the need for some trips during the workday. End-of-trip facilities are often included as design features in large projects to attract employees and may be selected by businesses as compliance options for Rule 9410.

Relevant General Plan Policies.

Policy MT-10-c Transportation Demand Management Guidelines. Establish transportation demand management guidelines to allow for reduced off-street parking requirements.

5.1.3.2 Parking Measures

Providing limited parking is one of the most effective transportation measures. Use of parking structures and paid parking provide a strong incentive to use alternative modes and to take advantage of carpools and vanpools. This measure would only apply in higher-density development areas, downtown, and mixed-use projects specifically designed for this strategy.



Relevant General Plan Policies.

Policy MT-10-a Updating Parking Standards. Update off-street parking standards to reflect the context and location within activity areas of multiple uses and reductions appropriate for mixed residential and non-residential uses and proximity to existing or planned transit service.

Policy MT-10-b Shared Parking. Establish a strategy to promote the sharing of excess parking between uses within Activity Centers and BRT corridors, including specific provisions for this in the Development Code.

Policy MT-10-d Parking Maximums. Explore maximum off-street parking limits within Activity Centers proximate to BRT corridors, if such an Activity Center is determined compatible with promotion of a healthy and vigorous business environment.

Policy MT-10-f Parking Benefit Districts. Establish parking benefit districts to fund consolidated public parking where supported by local businesses.

Key GHG Plan Indicators.

- Completion of parking standards update incorporating the policies
- Projects with shared parking approved
- Employers and educational facilities participating in subsidized transit programs

5.1.3.3 Electric Vehicle Charging Stations

Infrastructure to charge electric vehicles while at work or other destinations would allow longer distance commuters and other drivers to use electric vehicles without concern for running out of charge on the return trip. Quick-charge technologies are in development that can partially charge a car battery in 15 minutes. Once quick-charging stations are widely available, the range impediment of electric vehicles will be much less important.

The interim solution to battery range is hybrid vehicles that can run on electricity or conventional fuels. Plug-in hybrids have larger battery packs that allow vehicles to travel greater distances under battery power prior to use of the gasoline engine.

Relevant General Plan Policies.

Policy RC-8-j **Alternative Fuel Network.** Support the development of a network of integrated charging and alternate fuel station for both public and private vehicles, and if feasible, open up municipal stations to the public as part of network development.

Key GHG Plan Indicators.

- Completion of EV charging stations and alternative fuel stations

5.1.4 Energy Conservation Strategies for New and Existing Buildings

Improving energy efficiency in new and existing buildings and facilities provides one of the most cost-effective strategies for reducing greenhouse gases. The energy savings from improved energy efficiency can often pay for the cost of the upgrades and retrofits over time. These strategies are implemented through the promotion of energy- and water-efficient buildings (e.g., LEED buildings and/or exceeding Title 24 standards) through green building ordinances, project timing, prioritization, and other implementing tools.

5.1.4.1 Energy Efficiency in New Buildings

New projects can exceed Title 24 Energy Efficiency Standards for new residential and non-residential buildings. The amount of reductions in energy use can be related to voluntary tier levels contained in Title 24 or through use of outside certifying programs such as LEED, EnergyStar or Greenpoint Rating systems. It should be noted that meeting LEED standards does not necessarily mean that a project would comply with Title 24, so additional measures may still be required for some projects to meet regulatory requirements. The state's ultimate goal is for new buildings to achieve "net zero" energy consumption. Net zero requires a combination of high efficiency buildings and energy self-generation through solar power or other means. Once net zero buildings become the norm, opportunities for reductions from new building energy efficiency become limited. Locations and building designs that are not suitable for onsite generation will not be able to achieve net zero energy consumption with currently available technologies. For those sites, offsite generation in common areas or through purchase of energy generated by zero emission facilities may be used.

Relevant General Plan Policies.

- Objective RC-8** Reduce the consumption of non-renewable energy resources by requiring and encouraging conservation measures and the use of alternative energy sources.
- Policy RC-8-a** **Existing Standards and Programs.** Continue existing beneficial energy conservation programs, including adhering to the California Energy Code in new construction and major renovations.
- Policy RC-8-b** **Energy Reduction Targets.** Strive to reduce per capita residential electricity use to 1,800 kWh per year and nonresidential electricity use to 2,700 kWh per year per capita by developing and implementing incentives, design and operation standards, promoting alternative energy sources, and cost-effective savings.
- Policy RC-8-c** **Energy Conservation in New Development.** Consider providing an incentive program for new buildings that exceed California Energy Code requirements by fifteen percent.
- Policy RC-8-d** **Incentives.** Establish an incentive program for residential developers who commit to building all of their homes to ENERGY STAR performance guidelines.
- Policy RC-8-e** **Energy Use Disclosure.** Promote compliance with State law mandating disclosure of a building's energy data and rating of the previous year to prospective buyers and lessees of the entire building or lenders financing the entire building.

Key GHG Plan Indicators.

- Title 24 compliance reports demonstrating projects meet or exceed regulatory requirements.
- Project CEQA documents include discussion of energy conservation design features.
- Periodic compilation of building energy efficiency reports for comparison with Plan goals.

5.1.4.2 Energy Efficiency in Existing Buildings

Older buildings that were constructed prior to the adoption of Title 24 or that were constructed when early versions of Title 24 were in place provide significant opportunities for cost-effective energy retrofits. Most current energy retrofit programs are voluntary incentive based programs. The State of California and the federal government have from time to time offered tax credits and deductions for energy retrofits. Public utilities also offer energy efficiency rebates for projects such as whole-house fans, insulation, weatherization, and other actions that reduce energy consumption in residential and commercial buildings. Some jurisdictions have proposed mandatory energy efficiency retrofits at time of sale; however, those programs are currently considered by many to be infeasible because of the loss of equity experienced by many homeowners at the time of sale, especially when housing values are low.

In January 2011, the City Council unanimously approved the adoption of the California Property Assessed Clean Energy (PACE) program administered by figtreecompany.com for the City of Fresno.

PACE utilizes bond financing to provide property owners fixed-rate, property-based, no-money-down financing for energy and water efficiency retrofits to their properties, significantly reducing energy bills and expenses with instant cost savings. The City no longer has an active PACE program; however, in partnership with PG&E, the City has implemented programs to achieve reductions in electricity usage, particularly in the municipal sector.

Relevant General Plan Policies.

Policy RC-7-i **PACE Financing.** Develop a residential Property Assessed Clean Energy (PACE) program, if it is determined to be a feasible option, to help finance water efficiency and energy efficiency upgrades for property owners.

Key GHG Plan Indicators.

- Progress in implementing the PACE program.
- Report on types and numbers of projects funded.

5.1.4.3 Self-Generation Using Solar Panels and Solar Hot Water Systems

The city of Fresno’s location and climate is excellent for solar electric generation and hot water systems with an average of 262 sunny days per year. Residential and commercial projects can include solar-ready roofs to allow future installation of solar panels or provide solar panels at the time of construction. Solar panel technology is becoming increasingly efficient in terms of power production and costs have declined substantially in recent years. Not all locations and project settings are conducive to solar power production, and cost-effectiveness is currently dependent on the receipt of incentives in most cases. Sites with the potential for other structures or trees shading the panel location greatly reduce feasibility. The projects also often require net metering where surplus power generated by the panels is sold to the utility and power is purchased from the grid during periods of low production or high usage. The utilities are only required to accept a limited amount of solar photovoltaic (PV) distributed generation into their systems each year. If limits are exceeded and net metering is not allowed, the systems become less feasible.

Solar hot water systems have been used for residential water heating for many years and are especially popular for residences with swimming pools to extend the days per year when the pool can be used. Another option for hot water is to use tankless, electric water heaters. These are increasingly used in new development. Tankless heating saves water and energy because it is not necessary to run the water for long periods for the water to arrive from the hot water tank to the faucet as is the case with the conventional water heaters.

Relevant General Plan Policies.

Policy RC-8-h **Solar Assistance.** Identify and publicize information about financial mechanisms for private solar installations and provide over-the-counter permitting for solar installations meeting specified standards, which may include maximum size (in kV) of units that can be so approved.

Key GHG Plan Indicators.

- Projects permitted

5.1.5 Water Conservation Strategies

Water pumping and transport consumes approximately 20 percent of all energy used in California. Measures to reduce water consumption through improved efficiency in plumbing fixtures and landscaping can result in substantial savings compared to past practices. In some



Northeast Fresno Surface Water Treatment Plant

cases, it may be feasible to go beyond the water efficiency standards in the California Green Building Standards Code and the State Model Water Efficient Landscape Ordinance with new construction. Water reuse and recycling through non-potable “purple pipe” systems may reduce energy consumption for water transport. The City has started installing purple pipes through implementation of the Recycled Water Ordinance. The Ordinance requires that new developments within planned major recycled water distribution mains to install purple pipe. As the City’s capital projects construct distribution infrastructure, these segments will be in place to facilitate connections to new customers. The City’s initial implementation of the recycled water distribution system from the Recycled Water Reclamation Facility is currently under construction. The City plans to use 25,000 acre-feet per year of recycled water to irrigate open spaces, parks, street medians, and golf courses, and at groundwater recharge facilities. The City is constructing an advanced treatment facility at the Fresno-Clovis Regional Water Reclamation Facility (RWRF) to process and clean the water to meet State and federal standards and regulations for non-potable use. The initial capacity of the facility will be 5 million gallons per day with a future capacity of 30 million gallons per day. The new treatment facility will pump water into the new network of recycled water pipelines that will convey recycled water across the city. The route begins in a rural and agricultural area in Fresno county and moves to high traffic city streets. High traffic volumes, businesses, agriculture, cemeteries and residences are immediately adjacent to project route (Recharge Fresno 2018).

The use of recycled water focuses on new and existing large green spaces, industrial uses, and new development. However, the development of a gray water policy for the residential reuse of wastewater for household gardening and landscape irrigation on site may be feasible. Water users that implement these measures or purchase buildings and homes that include these features will benefit from savings in their water bills.

5.1.5.1 Relevant General Plan Policies

Policy RC-6-d Recycled Water. Prepare, adopt, and implement a City of Fresno Recycled Water Master Plan.

- Objective RC-7** Promote water conservation through standards, incentives and capital investments.
- Policy RC-7-a** **Water Conservation Program Target.** Maintain a comprehensive conservation program that reduces per capita water usage in the city’s water service area to 243 gallons per capita per day (gpcd) by 2020 and 190 gpcd by 2035, by adopting conservation standards and implementing a program of incentives, design and operation standards, and user fees.
- Support programs that result in decreased water demand, such as landscaping standards that require drought-tolerant plants, rebates for water conserving devices and systems, turf replacement, xeriscape landscape for new homes, irrigation controllers, commercial/industrial/institutional water conserving programs, prioritized leak detection program, complete water system audit, landscape water audit and budget program, and retrofit upon resale ordinance.
 - Implement the U.S. Bureau of Reclamation Best Management Practices for water conservation as necessary to maintain the City's surface water entitlements.
 - Adopt and implement policies in the event an artificial lake is proposed for development.
 - Work cooperatively toward effective uniform water conservation measures that would apply throughout the Planning Area.
 - Expand efforts to educate the public about water supply issues and water conservation techniques.
- Policy RC-7-d** **Update Standards for New Development.** Continue to refine water saving and conservation standards for new development.
- Policy RC-7-f** **Implementation and Update Conservation Program.** Continue to implement the City of Fresno Water Conservation Program, as may be updated, and periodically update restrictions on water uses, such as lawn and landscape watering and the filling of fountains and swimming pools, and penalties for violations. Evaluate the feasibility of a 2035 conservation target of 190 gpcd in the next comprehensive update of the City of Fresno Water Conservation Program.
- Policy RC-7-h** **Landscape Water Conservation Standards.** Refine landscape water conservation standards that will apply to new development installed landscapes, building on the State Model Water Efficient Landscape Ordinance and other State regulations.

- Evaluate and apply, as appropriate, augmented xeriscape, "water-wise," and "green gardening" practices to be implemented in public and private landscaping design and maintenance.
- Facilitate implementation of the State's Water Efficient Landscape Ordinance by developing alternative compliance measures that are easy to understand and observe.

Key GHG Plan Indicators.

- Track per capita water use with collected meter data and normal reporting.
- Progress in updating the Water Conservation Program.

5.1.6 Waste Diversion and Recycling and Energy Recovery

Programs and actions that promote recycling and diversion of waste from landfills can reduce energy consumed in the transport and handling of the waste material and can reduce the greenhouse gases that are emitted during the decomposition of organic waste.

The State of California has adopted increasingly stringent mandates for the percentage of solid waste that can be disposed in landfills. Programs that require or encourage further reductions in waste beyond mandates will result in greenhouse gas reductions from this source. Certain landfills are mandated to install methane capture systems. Methane is a powerful greenhouse gas that is 21 times more effective than carbon dioxide in retaining heat in the atmosphere. The methane can be flared, producing mainly carbon dioxide or used in combustion devices to generate heat or power that can be used for productive purposes displacing the use of fossil fuels.

Relevant General Plan Policies.

- Policy PU-9-a** **New Techniques.** Continue to collaborate affected stakeholders and partners to identify and support programs and new techniques of solid waste disposal, such as recycling, composting, waste to energy technology, and waste separation, to reduce the volume and toxicity of solid wastes that must be sent to landfill facilities.
- Policy PU-9-b** **Compliance with State Law.** Continue to pursue programs to maintain conformance with the Solid Waste Management Act of 1989 or as otherwise required by law and mandated diversion goals.
- Policy RC-11-a** **Waste Reduction Strategies.** Maintain current targets for recycling and re-use of all types of waste material in the city and enhance waste and wastewater management practices to reduce natural resource consumption, including the following measures:
- Continue to require recyclable material collection and storage areas in all residential development.

- Establish recycling collection and storage area standards for commercial and industrial facilities to size the recycling areas according to the anticipated types and amounts of recyclable material generated.
- Provide educational materials to residents on how and what to recycle and how to dispose of hazardous waste.
- Provide recycling canisters and collection in public areas where trash cans are also provided.
- Institute a program to evaluate major waste generators and identify recycling opportunities for their facilities and operations.
- Continue to partner with the California Integrated Waste Management Board on waste diversion and recycling programs and the CalMax (California Materials Exchange) program.
- Evaluate the feasibility of a residential, restaurant and institutional food waste segregation and recycling program, to reduce the amount of organic material sent to landfill and minimize the emissions generated by decomposing organic material.
- Evaluate the feasibility of “carbon footprinting” for the City’s wastewater treatment facilities, biomass and composting operations, solid waste collection and recycling programs.
- Expand yard waste collection to divert compostable waste from landfills.
- Study the feasibility and cost-benefit analysis of a municipal composting program to collect and compost food and yard waste, including institutional food and yard waste, using the resulting compost matter for City park and median maintenance.

Policy RC-11-b Zero Waste Strategy. Create a strategic and operations plan for fulfilling the City Council resolution committing the City to a Zero Waste goal.

Policy RC-4-i Methane Capture. Continue to pursue opportunities to reduce air pollution by using methane gas from the old City landfill and the City’s wastewater treatment process.

Key GHG Plan Indicators.

- Progress reports on achieving State mandated waste reduction and diversion goals.
- Adoption of commercial and industrial recycling area and storage standards.
- Adoption of the Zero Waste Strategy.

5.1.6.2 Wastewater

Wastewater treatment can produce methane emissions that are a powerful greenhouse gas, but it also provides a valuable renewable energy source when scrubbed of harmful components. Fresno currently operates a major regional secondary treatment plant and reuses water primarily for agricultural purposes. The City has one tertiary treatment facility at the Copper River development in north Fresno that provides water for a golf course and shared landscaped areas. Tertiary treatment of wastewater can allow its use for safely watering landscaped areas such as highway medians, parks, and golf courses using so-called “purple pipe” systems. Tertiary treatment systems can use substantial amounts of energy, so energy savings from less water pumping must be balanced with the energy costs of treating the water and pumping to where it is used. Wastewater treatment plants such as the Fresno/Clovis Regional Wastewater Reclamation Facility (RWRF) with anaerobic digesters capture the methane produced during the treatment process for productive use such as generation of electricity or process heat to offset some of the plant’s power consumption.



Fresno/Clovis RWRF

Relevant General Plan Policies.

- Objective PU-7** Promote reduction in wastewater flows and develop facilities for beneficial reuse of reclaimed water and biosolids for management and distribution of treated wastewater.
- Policy PU-7-a** **Reduce Wastewater.** Identify and consider implementing water conservation standards and other programs and policies, as determined appropriate, to reduce wastewater flows.
- Policy PU-7-d** **Wastewater Recycling.** Pursue the development of a recycled water system and the expansion of beneficial wastewater recycling opportunities, including a timely technical, practicable, and institutional evaluation of treatment, facility siting, and water exchange elements.

Key GHG Plan Indicators.

- Progress in adopting wastewater reduction programs.
- Feasibility studies regarding future tertiary treatment/recycling options.

5.1.6.3 Community Involvement and Outreach

Many of the strategies listed above will be more effective if there is community involvement and outreach to engage the citizens. This strategy requires public awareness of the measures available for them to take effective action at reducing their energy use and carbon footprint.

Measures and programs that reduce greenhouse gas emissions are often operated at the regional level. Many modes of transportation operate at the regional level, because people travel throughout the region. Regional cooperation provides a venue for sharing knowledge and resources to help address a variety of issues, including climate change and greenhouse gas emissions.

Relevant General Plan Policies.

- Policy RC-7-g** **Educate on State Requirements.** Educate the residents and businesses of Fresno on the requirements of the California Water Conservation Act of 2009.
- Policy RC-8-h** **Solar Assistance.** Identify and publicize information about financial mechanisms for private solar installations and provide over-the-counter permitting for solar installations meeting specified standards, which may include maximum size (in kV) of units that can be so approved.
- Policy RC-8-k** **Energy Efficiency Education.** Provide long-term and ongoing education of homeowners and businesses as to the value of energy efficiency and the need to upgrade existing structures on the regular basis as technology improves and structures age.

Key GHG Plan Indicators.

- Progress reports on education and outreach programs.
- Number of solar panel installation permits issued.

5.1.7 Municipal Strategies

The City of Fresno has a comprehensive set of strategies specifically targeted at greenhouse gas emissions generated at City-owned facilities and from City operations. The strategies identified by the City include the following measures intended to improve energy efficiency in buildings and equipment owned by the City, alternative fuels for City vehicles and equipment, and water conservation:

- Improve energy efficiency in City operations.
- New City buildings exceed Title 24 energy efficiency standards.
- Install renewable energy systems on City facilities.
- City operated transportation demand management for City employees.
- Purchase green vehicles for City fleets.
- Enhance reduction, recycling, and reuse efforts at City facilities.
- Implement water efficient landscaping in city parks and facilities.

Relevant General Plan Policies.

- Policy RC-7-c** **Best Practices for Conservation.** Require all City facilities and all new private development to follow U.S. Bureau of Reclamation Best Management Practices for water conservation, as warranted and appropriate.

- Policy RC-7-e** **Retrofit City Facilities, and Consider Incentives Programs to Encourage Retrofitting of Other Existing Public and Private Residential and Non-Residential Facilities and Sites.** Reduce water use in municipal buildings and City operations by developing a schedule and budget for the retrofit of existing municipal buildings with water conservation features, such as auto shut-off faucets and water saving irrigation systems. Prepare a comprehensive incentive program for other existing public and private residential and non-residential buildings and irrigation systems.
- Policy RC-8-f** **City Heating and Cooling.** Reduce energy use at City facilities by updating heating and cooling equipment and installing “smart lighting” where feasible and economically viable.
- Policy RC-8-g** **Revolving Energy Fund.** Create a City Energy Fund which uses first year savings and rebates from completed City-owned energy efficiency projects to provide resources for additional energy projects. Dedicate this revolving fund to the sole use of energy efficiency projects that will pay back into the fund.

Key GHG Plan Indicators.

- Progress reports from responsible departments on conservation efforts.
- Progress on creating a City Energy Fund.
- Identification and recognition of major individual conservation projects.

5.1.7.2 Regional Urban Forestry Program

Trees provide shade that can reduce the urban heat island effect caused when pavement and other open surfaces absorb solar radiation and re-radiate heat to the surrounding environment. The shade can reduce energy required for cooling. Trees also store carbon as they grow, in a process referred to as sequestration. Emission reductions from urban forestry projects must consider the life cycle emissions such as tree maintenance and the ultimate disposition of trees at the end of their lives to ensure that they produce a net decrease in greenhouse gas emissions.

The City maintains trees in parks and other publicly owned landscaped areas. These areas may provide an opportunity for new tree planting or replacement of tree species that possess a low potential to store carbon, with tree species that possess higher carbon storage potential. Guidance for managing urban forests is available from a number of sources. The Climate Action Reserve, Urban Forest Project Reporting Protocol (CAR 2019) provides criteria for generating greenhouse gas emission offsets with tree planting along with procedures for project monitoring. ICLEI’s Urban Forestry Toolkit for Local Governments provides a series of fact sheets and case studies that communities can use to design an effective urban forestry program (ICLEI 2006).

Relevant General Plan Policies.

- Policy POSS-1-g** **Regional Urban Forest.** Maintain and implement incrementally, through new development projects, additions to Fresno’s regional urban forest to delineate

corridors and the boundaries of urban areas, and to provide tree canopy for bike lanes, sidewalks, parking lots, and trails.

Key GHG Plan Indicators.

- Track change in urban tree cover over time.

5.1.7.3 Other Municipal Strategies

Energy Savings from Traffic and Street Lighting. The City plans to replace lighting fixtures with more efficient LED or other technology whenever possible. According to a report prepared by PG&E, Phase II LED luminaires provided power savings of 36 percent compared with high-pressure sodium luminaires, and the newer Phase III LED luminaires provided 52 percent savings (PG&E 2008).

Low-Emission City Fleet Vehicles. The City operates vehicles used by the FAX bus fleet, the Solid Waste Division, the Police Department and for maintenance and other purposes. The City has already converted all buses to compressed natural gas (CNG). FAX currently operates 110 alternatively fueled CNG buses. In 2014, the CARB approved a regulation setting a Statewide goal for public transit agencies to transition to 100 percent zero-emission bus fleets by 2040, and requiring that all new bus procurements be carbon-free by 2029. FAX's most recent bus order included two Proterra all-electric battery 40-foot buses, anticipated to arrive in mid-2020 with an additional order of seven scheduled for revenue service in 2020. Through these investments, FAX continues to showcase its commitment to cleaner vehicles and a cleaner environment.

Green Purchasing. The City makes purchases typical for city government operations such as vehicles, computers, paper, and materials required to maintain the City's infrastructure. The City's compressed natural gas (CNG) fleet vehicles provide good examples of its past green purchasing practices.

Municipal Water Conservation. The City has implemented water saving measures at most public parks, and other landscaped areas maintained by the City. The General Plan Policies listed in the Water Conservation Strategies section apply to municipally operated facilities.

5.1.8 Strategies for Existing Development

The GHG Plan Update strategies described above are implemented in two ways. New development projects would be constructed consistent with the General Plan and GHG Plan Update. Existing residents and businesses would comply with regulations that apply to everyone and participate in new and existing programs and measures. People living in existing residential development also share the benefits of the land use strategies applied at work places and commercial areas that are walkable and transit oriented. The strategies that apply directly and indirectly to existing development are shown in Table 5-B.

Table 5-B: Strategies for Existing Development

Strategy	How it Applies
Transportation Demand Management (TDM)	TDM is implemented at existing and new businesses and can also reduce trips from new and existing housing where employees live.
Expanded Transit Service	Improved transit service will encourage increased ridership from new and existing development.
Improved Connections to Transit Stations	Transit stations service a wider community area that includes connections to new and existing development through sidewalks and bike lanes.
Traffic Calming Retrofits	Traffic calming designs can be retrofitted on existing roads or built in new development.
Complete Streets Program	Complete streets connect existing and new areas.
Parking Management	Parking management at new and existing employment centers encourages trip reductions from all residential development
Energy Retrofits	Educational and incentive programs encourage existing residents and business owners to install energy retrofits providing large benefits in older structures.
Bicycle and Pedestrian Improvements on Existing Roads and near transit stations	Bicycle paths and lanes can be retrofitted on existing roads, near transit stations. Sidewalks and pedestrian paths can connect existing neighborhoods with appropriate destinations including transit stations.
Bicycle Parking Facilities	Bicycle parking can be added to existing businesses if needed to satisfy demand by employees and customers.
Water Conservation Programs	Educational and incentive programs encourage existing residents and businesses to conserve water.
Recycled Water Use in Existing Parks	Recycled water can be piped to any area retrofitted or initially developed with a “purple pipe” system to distribute recycled water.
Energy Retrofits	Educational and incentive programs encourage existing residents and business owners to install energy retrofits providing large benefits in older structures.
Bicycle Parking Facilities	Bicycle parking can be added to existing businesses if needed to satisfy demand by employees and customers.
Recycling Programs	Operational programs such as recycling apply to all residents and businesses in the city.
Electric Vehicle Charging	Charging stations can be installed in existing development as a retrofit or in new development.
Measures That Apply to New Development but Indirectly Benefit Existing Development	
Transit and Pedestrian Oriented Development	Transit and pedestrian oriented development provides destinations that encourage transit use from existing development and walking once people arrive.
Mixed Use Development	Mixed-use development creates a more walkable environment conducive to transit use for trips from existing development.
Compact Development	Making the city more compact shortens average trip lengths for residents and creates more opportunities for transit.
Traffic Flow Improvements	Transportation improvements that reduce congestion and improve flow can reduce emissions from both existing and new development.
Recycling Programs	Operational programs such as recycling apply to all residents and businesses in the city.
Electric Vehicle Charging	Charging stations can be installed in existing development as a retrofit or in new development.

5.2 REDUCTION POTENTIAL FROM LOCAL MEASURES

Reductions beyond State regulations will be achieved through the development of the land use pattern and transportation system envisioned by the General Plan, enforcement of City ordinances and design standards, and direct reductions from energy conservation projects, and alternative fuels use.

The effectiveness of the GHG land use strategy is dependent on several factors. The first factor is the rate of population growth. Rapid population growth has two contradictory effects. First, the overall growth in emissions will increase substantially in high growth areas; however, the per capita emissions in high growth areas will be lower. This is because a larger percentage of the population will live in areas of the city with energy efficient homes and businesses, and better transportation options than the slow growing or built out counterparts. On a citywide basis, faster-growing cities will build out neighborhoods and shopping centers more rapidly, providing more work and shopping opportunities close to home and shorter travel distances.

The second factor is economic. The type and scale of development projects will vary depending on market forces and the state of the economy in future years. Market forces affect the amount of single-family development compared to multi-family development. A vibrant economy will tend to create more jobs and increase in migration.

The amount of trips and miles traveled varies substantially between highly urban areas and suburban and rural areas. Frequent bus, light rail, or commuter train service requires high development densities to provide adequate ridership to support the service. The reductions that can be achieved by pedestrian orientated development and transit oriented development vary widely based the density and design at both ends of the trip.

5.2.1 Mobile Source Reductions

5.2.1.1 Land Use Strategy

SB 375 required the CARB to set regional targets for reductions from light duty passenger vehicle emission. After a lengthy review process and input from the regional transportation planning agencies, the CARB adopted a Fresno County target reduction in passenger vehicle CO₂e per capita of 4.7 percent by 2020 and 7.6 percent by 2035. The key strategies envisioned include:

- Combination of density increase, mixed uses, and infill
- Growth along major transit corridors and activity centers

The land use strategies are expected to reduce trip generation and vehicle miles traveled to achieve the percentage reductions based on modeling results from the regional transportation model for the General Plan land use scenario. The City of Fresno is participating in the SB 375 SCS process to more closely define the growth areas that would be part of the SCS and qualify for CEQA streamlining provisions.

Emission reductions at the individual project level would be substantially larger than the amounts estimated for as the overall reduction for SB 375 compliance. CAPCOA estimates that land use and

transportation measures in a suburban setting can reduce emissions by a global maximum of 15 percent and 20 percent in a suburban center. Projects approaching the maximum reductions would be in locations served by frequent transit with complete pedestrian and bicycle infrastructure and multiple destinations such as retail and commercial service within walking distance.

5.2.1.2 Transportation Demand Management

The General Plan encourages transportation demand management (TDM) at projects that are large employers. The SJVAPCD Rule 9410 – Employer Trip Reduction would provide at 1.6 percent emission reduction in 2020 and 2035 through reduced trips and vehicle miles traveled.

The land use strategy and transportation demand management would provide a combined 45,184 MT CO₂e/year in emission reductions by 2020, a 66,191 MT CO₂e/year reduction by 2030, and a 80,114 MT CO₂e/year reduction by 2035. The assumptions used for these calculations are based on the 2014 GHG Plan with the adoption of General Plan land use strategy and compliance with SJVAPCD Rule 9410.

5.2.1.3 Implement Support for Electric Vehicles

Hybrid EVs, plug-in hybrid EVs, and all-EVs produce lower emissions than conventional vehicles. Any type of electrified vehicle emits less GHG than conventional vehicles by at least 40 percent. The City could promote EVs by establishing EV incentive programs, installing EV chargers within residential units and commercial building parking lots and providing streamlined permitting ordinance for EV charging stations. Based upon the historic trends in EV ownership and the CARB Zero-Emission Vehicles (ZEV) Action Plan, it is assumed that by 2030 EV ownership in the city would reach 8.7 percent, and by 2035, 13 percent of the vehicle trips would be made by EVs.

CALGreen, the State green building code (California Code of Regulations [CCR], Title 24, Part 11), sets requirements for installing EV-capable infrastructure in new residential and nonresidential buildings. CALGreen contains minimum requirements that apply statewide as well as reach codes that can be adopted by local governments. Starting January 1, 2020, CALGreen requires that new construction of single-family residences, duplexes, and townhouses with private garages must have raceway and panel capacity to support the future installation of level 2 charging stations (CEC 2019, ICC 2019). The City supports increased EVs within the city by encouraging the installation of EV chargers within new and existing multi-family residential and commercial parking areas within the city.

5.2.1.4 Implementation Support for Zero Emission Buses

To implement the State of California's Innovative Clean Transit regulation¹⁰ of 100 percent zero-emission buses by 2040 (CARB 2019), FAX needs regulatory and financial support to determine the

¹⁰ To transition successfully to an all zero-emission bus fleet by 2040, each transit agency will submit a rollout plan under the regulation demonstrating how it plans to purchase clean buses, build out necessary infrastructure and train the required workforce. The rollout plans are due in 2020 for large transit agencies and in 2023 for small agencies. Agencies will then follow a phased schedule from 2023 until 2029, by which date 100 percent of annual new bus purchases will be zero-emission.

most viable options for transitioning its fleet to zero emission buses (ZEBs). FAX should consider potential funding mechanisms for this program. Some potential strategies are as follows:

- Traditional financing methods, such as municipal bonds and local option transportation taxes to finance the purchase and/or operation of new ZEBs.
- Collaboration with local utilities to obtain beneficial rate structures to reduce charging costs and work with utilities to secure charging infrastructure investments.
- Federal, State, regional, and local grant and incentive programs to reduce the initial purchase price of ZEBs.

In addition to funding, building the infrastructure necessary to deploy the ZEBs, and procuring electricity, hydrogen, or other alternative fuel sources to operate them pose challenges for FAX that will require innovative approaches and best practices to operate a full fleet of ZEBs in the City by 2040. FAX is currently working on its rollout plan to meet all requirements by 2040.

5.2.2 Energy Efficiency Reductions

5.2.2.1 Building Energy Efficiency

The City supports the State's efforts to achieve net zero energy consumption in new residential and non-residential buildings. Achieving net zero is currently possible in some buildings with the use of onsite solar to offset the electricity consumption from the grid. The 2019 Title 24 standards that will go into effect in January 2020 are substantially more stringent than the 2016 Title 24 standards and focus on achieving zero net energy homes.

The City encourages developers to achieve the voluntary tier levels from the CPUC Energy Efficiency Strategic Plan, which ultimately lead to net zero energy consumption for residential development by 2020 and non-residential development by 2030. GHG emission reductions from net zero energy homes have been accounted for under State regulations in Chapter 4 as the 2019 Title 24 standards include this requirement. By achieving net zero energy consumption for non-residential development by 2030, the City would reduce GHG emissions by 70,230 MT CO₂e/year by 2030, and 100,237 MT CO₂e/year by 2035. Once Title 24 mandates net zero energy consumption, no further reductions beyond regulation can be achieved by projects.

5.2.3 Water Conservation

The California Water Conservation Act mandates a 20 percent reduction in water usage by 2020. The City has a reduction target of per capita water usage in the City's water service area to 230 gallons per day per capita (25 percent below the current consumption rate) in 2035. The City will meet the reduction target with measures applicable to new and existing development. Reductions beyond the state mandated 20 percent are possible with the use of building and landscaping water conservation features. The reductions from buildings can be achieved with high-efficiency toilets, low-flow showers and faucets, and water-efficient appliances such as clothes washers and dishwashers. Water savings from landscaping would be achieved primarily through the use of synthetic ('turf') lawns, drought-tolerant landscaping or xeriscaping. The City is also proposing

General Plan Policy RC-7-b that requires a tiered water cost structure to cover the true cost of the water supply. Example measures and water savings estimates are provided below.

Indoor Water Conservation Measures.

- **Hot Water Pipe Insulation:** Insulate hot-water pipes, and separation of hot and cold piping to avoid heat exchange. Water savings: 2,400 gallons per residential unit per year. Cost: \$50/unit.
- **Pressure Reducing Valves.** Pressure reducing valves maintain pressure below 60 psi reducing volume of any leakage present and preventing excessive flow from all appliances and fixtures. Water savings: 30,000 gallons approximately per residential unit per year. Cost: \$100-\$150 per unit¹¹.
- **Water-Efficient Dishwashers.** Install Energy Star-certified units. Water savings: 5000 gallons per residential unit per year¹².
- **Dual Flush Toilets:** Provides option to flush with partial (0.8 gallon) flow of water or with a full (1.6 gallons) flow depending on need. Water savings: 13,000 gallons per year per toilet¹³. Cost: \$200 per toilet; however, retrofit kits are available for under \$20.
- **High-Efficiency Washing Machines:** Use front loading and top loading Energy Star-qualified clothes washers that use 35 to 50 percent less water than conventional washing machines. Water savings: 7,000 gallons per year¹⁴. Cost: \$800 for a high-efficiency washing machine.
- **Point-of-Use or Tankless Water Heaters:** Install small water heaters close to the point of use, such as bathrooms, kitchen, and laundry area. Water savings: 5,300 gallons per residential unit per year¹⁵. Cost: \$700 for point of use water heaters. However, the cost is approximately the same for one large unit or three smaller ones.

Outdoor Water Conservation Measures.

- **Evapotranspiration (ET) Controllers:** Irrigation scheduled by actual plant ET rates. Water savings: 20,000 gallons per single-family unit per year. Cost: \$175 per controller and \$48 per year in maintenance.

¹¹ Water Pressure Reducing Valves: Frequently Asked Questions. Website: www.watts.com/resources/references-tools/waterpressurereducingvalvesfaq (accessed August 10, 2019).

¹² Energy Star Appliances: Dishwashers Vs. Handwashing Dishes. Website: www.energystar.gov/products/appliances/dishwashers/dishwasher_hand_washing (accessed August 10, 2019).

¹³ Energy Efficient Toilets Comparison: Constellation Energy. Website: www.blog.constellation.com/2017/09/25/energy-efficient-toilets-comparison/ (accessed August 10, 2019).

¹⁴ Energy Star High Efficiency Clothes Washers. Website: www.energystar.gov/products/appliances/clothes_washers (accessed August 10, 2019).

¹⁵ Energy Star Point of Contact Heaters. Website: www.energystar.gov/products/water_heaters/point_use_pou_water_heaters (accessed August 10, 2019).

- **Water-Efficient Landscaping:** Use drought tolerant plants and compliant irrigation systems and controllers. Water Savings: Up to 50 percent of outdoor use (12,000 gallons/year from a 2,100-square foot landscaped area. Cost: similar to conventional landscaping.
- **Xeriscape:** Xeriscaping is a combination of seven principles, planning and design, practical turf areas, efficient irrigation, soil analysis and improvement, mulching, low-water-use plants, and appropriate maintenance. Water savings: 30 percent reduction in irrigation demand or about 16,000 gallons per year on a typical single-family lot. Cost: similar to conventional landscaping.

Estimates of water savings and costs are from the City of Chula Vista Water Conservation Plan Guidelines adopted in 2003.

5.2.3.2 Energy Savings from Water Conservation

The combined benefits of indoor and outdoor water conservation program are estimated at 20 percent in 2020 to achieve compliance with state-mandated reductions and 25 percent by 2035 to meet the General Plan target, which are consistent with the assumptions in 2014 GHG Plan. Reductions in water use reduce electricity consumed for pumping, treatment, and transport of water by proportional amounts. Reductions in water use by these amounts would provide emission reductions of 5,975 MT CO₂e/year by 2020 and 8,891 MT CO₂e/year by 2035. Assuming a constant reduction rate, the emission reductions in 2030 would be 7,840 MT CO₂e/year.

5.2.4 Waste Diversion and Recycling Reductions

The City of Fresno will meet or exceed the state-mandated 75 percent diversion target in the future. The CARB estimates that statewide reductions of 20 to 30 MMT CO₂e will be achieved through this strategy. The City of Fresno has achieved substantial progress to date. The city per capita baseline based on the 2002 to 2004 average is 6.6 pounds per day per person. The 2018 per capita rate was 4.8 pounds per day per person, which was assumed to be consistent through 2020. The 75 percent diversion target would require a per capita rate of 1.65 pounds per person per day. Achieving net zero waste would provide additional reductions from this sector; however, no reductions are estimated pending adoption of a state mandate. The estimated emission reductions from achieving the 75 percent mandated diversion target are 84,677 MT CO₂e/year in 2030, and 90,043 MT CO₂e/year in 2035.

5.2.5 Summary of Reductions from Local Measures

Table 5-C summarizes the local reductions from the measures described above.

Table 5-D summarizes the baseline 2010 and updated 2016 GHG emissions, the projected 2020, 2030, and 2035 emission inventories, as well as the reduced 2020, 2030, and 2035 inventories after implementation of the State and local reduction measures.

By 2020, the Statewide and local measures together would reduce the city's GHG emissions from the 2020 BAU level to 2,081,167MT CO₂e, which would exceed the 15 percent below baseline levels reduction target of 3,183,348 MT CO₂e for 2020. By 2030, the Statewide and local measures together would reduce emissions to 1,710,386 MT CO₂e, which would exceed the 49 percent below

Table 5-C: Emissions Reductions from Local Measures

Sector	Local Measures	Emissions Reductions (MT CO ₂ e/year)		
		2020	2030	2035
Transportation	Land Use Strategy and Transportation Demand Management	45,184	66,191	80,114
Commercial Energy	Net Zero Energy Commercial Building	-	70,230	100,237
Industrial Energy (Water)	Water Conservation	5,975	7,840	8,981
Solid Waste	Waste Diversion and Recycling	-	84,677	90,043
Total		51,159	228,938	279,375

Source: Compiled by LSA Associates, Inc. (2019).

Table 5-D: GHG Emissions and Targets Comparison

	2010 (MT CO ₂ e) ¹	2016 (MT CO ₂ e)	2020 (MT CO ₂ e)	2030 (MT CO ₂ e)	2035 (MT CO ₂ e)
BAU Emissions	3,745,115	2,923,633	3,092,486	3,500,204	3,697,738
<i>State Reductions</i>	-	-	960,160	1,560,880	1,896,602
ABAU Emissions	3,745,115	2,923,633	2,132,326	1,939,325	1,801,137
<i>Local Measures Reductions</i>	-	-	51,159	228,938	279,375
Total Adjusted Emissions	-	-	2,081,167	1,710,386	1,521,761
Reduction Target	-	-	3,183,348	1,910,009	1,591,674
Additional Reductions Needed	-	-	Target Met	Target Met	Target Met

Source: Compiled by LSA Associates, Inc. (2019).

¹ Baseline (2010) emissions are from the City's 2014 GHG Reduction Plan.

GHG = greenhouse gas

ABAU = Adjusted Business-as-Usual

BAU = Business-as-Usual

MT CO₂e = metric tons of carbon dioxide equivalent

baseline levels reduction target of 1,910,009 MT CO₂e for 2030. In 2035, implementation of Statewide and local measures together would reduce emissions from the 2035 BAU level to 1,521,761 MT CO₂e, which would exceed the 58 percent below baseline levels reduction target of 1,591,674 MT CO₂e for 2035.

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6.0 DEVELOPMENT PROJECT REQUIREMENTS

This section describes the actions that individual development projects would be required to implement in order to qualify for California Environmental Quality Act (CEQA streamlining) and to demonstrate that the project would not result in significant GHG impacts. Projects that have completed all environmental review prior to adoption of the GHG Plan Update must comply with regulations in effect at the time of construction and with conditions of approval that were required during review of the tract map, development permit, or conditional use permit approved by the City. This means that all development will help meet the City's GHG reduction targets.

6.1 PROJECTS EXEMPT FROM CEQA

Projects that have already completed the CEQA process and only require building permits have no requirements beyond applicable regulations such as the California Building Code, Title 24 Energy Efficiency Standards, the City Development Code, and other City Ordinances.

6.1.1 City Development Code

Consult the Development Code for requirements for each type of project. Examples include:

- Street Design (complete streets and bus stops) (applies if project involves street improvements)
- Pedestrian Improvements (sidewalks, paths, connections, etc.)
- Bicycle Lanes and Paths (consistent with the Active Transportation Plan)
- Bicycle Parking (Commercial)
- Enforce Building Code Requirements (Green Building Code)

6.1.2 State Regulations

Project buildings must meet the California Energy Code and the California Green Building Standard Code.

6.2 PROJECTS REQUIRING A DISCRETIONARY APPROVAL

Projects requiring a discretionary approval from the City must comply with CEQA provisions related to GHG emissions. Projects that are consistent with the GHG Plan Update by demonstrating consistency with the GHG Plan Update Consistency Checklist (checklist) are considered CEQA-compliant for GHG impacts. The following review process is proposed:

6.2.1 New Discretionary Development Approval Process to Determine Consistency with GHG Reduction Plan Update

1. Review the GHG Reduction Plan Project Update CEQA Consistency Checklist (Appendix B) that lists the local GHG reduction strategies identified in the GHG Plan Update to determine applicability to the project.
2. Incorporate design features or mitigation measures into the project as needed to demonstrate consistency.

3. Implement project design features suitable for the development type and location.

Proposed development projects that are consistent with the GHG Plan Update as determined through the use GHG Plan Update CEQA Consistency Checklist may rely on the GHG Plan Update for the cumulative impacts analysis of GHG emissions. Projects that are not consistent with the GHG Plan Update must prepare a comprehensive project-specific analysis of GHG emissions, including quantification of existing and projected GHG emissions and apply appropriate GHG reduction mitigation measures based on the GHG reduction strategies identified in the GHG Plan Update and listed in the checklist.

6.2.2 New Discretionary Development requiring a General Plan Amendment

1. Comply with all of the applicable measures listed above for ministerial and discretionary projects.
2. Ensure that change in land use designation would not result in a significant increase in GHG emissions compared to the existing designation (would require a GHG technical study to quantify GHG emissions and benefits of project design features).
3. Projects currently designated for residential or commercial development that increase development densities and intensities and comply with the relevant GHG reduction strategies in the General Plan, or provide quantified GHG emission reduction calculations which demonstrates that the project would mitigate the cumulative GHG emissions, are considered to have a less than significant GHG impact.
4. Emissions from stationary sources for new industrial projects are not considered in the significance determination; however, emissions from motor vehicles trips generated by the project and energy efficiency of the building are considered.
5. Projects that propose decreases in development densities or intensities requiring a General Plan amendment will require analysis of GHG emissions to determine the impacts on the General Plan land use strategy and must identify mitigation measures to reduce greenhouse gas emissions beyond those required by regulation if needed.

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7.0 GHG PLAN UPDATE IMPLEMENTATION MONITORING

This chapter describes the steps for implementing the GHG Plan Update to support achievement of GHG reduction goals for the community at large. Success in meeting the City's GHG emission reduction goals will depend on cooperation, innovation, and participation by the City, residents, businesses, and local government entities. This section outlines key steps that the City could follow for the implementation of this GHG Plan Update. The GHG Plan Update is designed so that it can be monitored, updated, and its effectiveness measured on an annual basis towards meeting a target for reduction of greenhouse gas emissions in 2020 and 2030 to measure further progress through horizon of the General Plan in 2035. The reporting required for the General Plan provides a good venue for monitoring the GHG Plan. California Government Code Section 65400 requires the City to prepare and submit an annual report on the status of the General Plan and progress in its implementation to the City Council, the Governor's Office of Planning and Research, and the Department of Housing and Community Development. This section provides a guide the City could use to implement the GHG Plan.

7.1 GHG PLAN UPDATE IMPLEMENTATION

Successful implementation of the GHG Plan Update will require implementation and monitoring which could incorporate the following components, which are described in more detail in the sections below:

- Administration and staffing;
- Financing and budgeting;
- Timelines for GHG reduction strategies implementation;
- Community outreach and education; and
- Monitoring, reporting, and adaptive management.

These are basic steps that any City might take or that other California communities have taken to implement a GHG reduction plan. These are suggested—not required—and are intended to guide a City in its implementation planning.

7.1.1 Administration and Staffing

Implementation of the GHG Plan Update will involve coordination with other regional agencies. The City may designate staff to oversee the successful implementation and the tracking of all selected GHG reduction strategies. The City could coordinate with contacts across departments to gather data, to report on progress, to track completed projects, and to ensure that scheduling and funding of upcoming projects is discussed at key City meetings. The City may identify one or more staff to act as the Plan Implementation Administrator(s) to guide monitoring, reporting, and dissemination of information to the public. Where possible, the City may use assistants from programs such as CivicSpark, an AmeriCorps program designed to build capacity for local governments to address climate change.

The Administrator could have the following responsibilities:

- Serve as the external communication hub to local and regional agencies in coordinating the implementation of the GHG Reduction Plan
- Investigate methods to use existing resources and harness community support to better streamline implementation of the Plan
- Monitor implementation of reduction strategies and success of the GHG Plan Update
- Establish guidelines for reporting and documenting emission-reduction progress.
- Track State and federal legislation and its applicability to the City

In general, the goal in implementing the GHG Plan Update is not to create new administrative tasks or new staff positions necessarily, but rather to leverage existing programs and staff to the maximum extent feasible. Cities may seek to fold GHG planning and long-term reduction into their existing procedures, institutional organization, reporting, and long-term planning.

7.1.2 Financing and Budgeting

Implementation of the local GHG reduction strategies may require investment for the capital improvements and other investments, and increased operations and maintenance costs. However, in some cases operating costs are anticipated to decrease, resulting in offset savings. Table C-1 in Appendix C, Potential Funding Sources to Support GHG Reduction Strategies, presents a summary of potential funding and financing options available at the time of writing this document. Some funding sources are not necessarily directed towards a city, but to a larger regional agency such as the SJVAPCD. The City could monitor private and public funding sources for new grant and rebate opportunities and to better understand how larger agencies are accessing funds that can be used for GHG reductions in their areas. Leveraging financing sources is one of the most important roles a local government can play in helping the community to implement many of the GHG reduction strategies. A study commissioned by the City,¹⁶ Energize Fresno Funding Market Study, March 2017, provides a detailed analysis of potential funding mechanisms that could also support the implementation of the GHG reduction strategies identified in the GHG Plan Update.

7.1.3 Timelines for GHG reduction strategies Implementation

After taking into account the reductions in energy and water usage and the GHG emissions resulting from statewide measures, presently it would appear that without future State action the City would need to implement the local reduction strategies to reach its reduction targets for 2035. The City could prioritize the implementation of GHG reduction strategies based on following criteria:

- Cost effectiveness
- GHG reduction efficiency
- Availability of funding
- Level of City Control

¹⁶ Energize Fresno Funding Market Study. 2017. Website: www.lgc.org/wordpress/wp-content/uploads/2018/02/Energize-Fresno-Funding-Market-Study.pdf (accessed August 14, 2019).

- Ease of implementation
- Time to implement

To encourage implementation of all reduction strategies, City staff could develop a GHG Plan Update Implementation Timeline. GHG reduction Strategy prioritization could be based on the factors shown in Appendix C.

7.2 MONITORING THE GHG PLAN UPDATE

Regular monitoring is important to ensure programs function as they were originally intended. Early identification of effective strategies and potential issues would enable the City to make informed decisions on future priorities, funding, and scheduling. Moreover, monitoring provides concrete data to document the City's progress in reducing GHG emissions. The City would be responsible for developing a protocol for monitoring the effectiveness of emission reduction programs as well as for undertaking emission inventory updates. Below are some of the key components of a GHG Plan monitoring program.

- **Update GHG Inventory:** The City could update the inventory emissions prior to 2030 to ensure they meet their GHG reduction goals. This includes regular data collection in each of the primary inventory sectors (utility, regional VMT, waste, wastewater, and water), and comparing the inventory to the City's baseline GHG emissions in 2010 and 2016. The City would consolidate information in a database or spreadsheet that could be used to evaluate the effectiveness of individual reduction strategies.
- **Track State Progress:** The GHG Plan Update relies heavily on Statewide measures. The City should track the State's progress on implementing Statewide programs. Close monitoring of the reductions achieved by State programs would allow the City to adjust its GHG Plan Update, if needed.
- **Track Completion of GHG Reduction Strategies:** The City could keep track of strategies implemented as scheduled in the GHG Plan Update, including progress reports on each strategy, funding, and savings. This would allow at least a rough attribution of gains when combined with regular GHG inventory updates.
- **Regular Progress Reports:** The City may report on the GHG Plan Update implementation progress annually to the City Council as a part of the annual report on progress in implementing General Plan. If annual reports, periodic inventories, or other information indicates that the GHG reduction strategies are not as effective as originally anticipated, the GHG Plan Update may need to be adjusted, amended, or supplemented.

7.3 GHG PLAN UPDATE TRACKING TOOL

The City GHG Plan Update Project Consistency Checklist (checklist) (Appendix B), provides a platform and framework to track the GHG reduction strategy implementation. The City could compile the data obtained from the checklist annually to monitor and track the progress on GHG reductions

achieved through the implementation of the GHG reduction strategies identified in the GHG Plan Update.

The City is currently using an online Accela-based system to track permit applications for development projects. This permit tracking system could be transformed into a GHG reduction monitoring tool, where the City would be able to track GHG reductions achieved through implementation of the GHG reduction strategies within the GHG Plan Update. This would help the City to monitor the GHG Plan Update's implementation progress without added administrative burden, and to share findings with stakeholders, partners, and the community.

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APPENDIX A

GENERAL PLAN POLICY LIST

The General Plan is the foundation of the City of Fresno’s strategy to reduce development related greenhouse gas emissions. The City’s land use authority provides its most effective means of limiting the impact of growth predicted for the City. The Greenhouse Gas Reduction Plan (GHG Plan) relates the benefits of the General Plan and the City’s strategy for achieving greenhouse gas (GHG) reduction targets. Table A-1 is a list of General Plan Policies that provide GHG reductions or support GHG Reduction Plan Update (GHG Plan Update) strategies.

Table A-1: General Plan Objectives and Policies

Urban Form Element	
Policy UF-1-c	Identifiable City Structure. Focus integrated and ongoing planning efforts to achieve an identifiable city structure, comprised of a concentration of buildings, people, and pedestrian-oriented activity in Downtown; along a small number of transit-oriented, mixed-use corridors and strategically located Activity Centers; and in existing and new neighborhoods augmented with parks and connected by multi-purpose trails and tree lined bike lanes and streets.
Objective UF-12	Locate roughly one-half of future residential development in infill areas — defined as being within the City on December 31, 2012—including the Downtown core area and surrounding neighborhoods, mixed-use centers and transit-oriented development along major BRT corridors, and other non-corridor infill areas, and vacant land.
Policy UF-12-a	BRT Corridors. Design land uses and integrate development site plans along BRT corridors, with transit-oriented development that supports transit ridership and convenient pedestrian access to bus stops and BRT station stops.
Policy UF-12-b	Activity Centers. Mixed-use designated areas along BRT and/or transit corridors are appropriate for more intensive concentrations of urban uses. Typical uses could include commercial areas; employment centers; schools; compact residential development; religious institutions; parks; and other gathering points where residents may interact, work, and obtain goods and services in the same place.
Policy UF-12-d	Appropriate Mixed-Use. Facilitate the development of vertical and horizontal mixed-uses to blend residential, commercial, and public land uses on one or adjacent sites. Ensure land use compatibility between mixed-use districts in Activity Centers and the surrounding residential neighborhoods.
Policy UF-12-e	Access to Activity Centers. Promote adoption and implementation of standards supporting pedestrian activities and bicycle linkages from surrounding land uses and neighborhoods into Activity Centers and to transit stops. Provide for priority transit routes and facilities to serve the Activity Centers.
Policy UF-12-f	Mixed-Use in Activity Centers. Adopt a new Development Code which includes use regulations and standards to allow for mixed uses and shared parking facilities.
Objective UF-14	Create an urban form to facilitate multi-modal connectivity.
Policy UF-14-a	Design Guidelines for Walkability. Develop and use design guidelines and standards for a walkable and pedestrian-scaled environment with a network of streets and connections for pedestrians and bicyclists, as well as transit and autos.
Policy UF-14-b	Local Street Connectivity. Design local roadways to connect throughout neighborhoods and large private developments with adjacent major roadways and pathways of existing adjacent development. Create access for pedestrians and bicycles where a local street must dead end or be designed as a cul-de-sac to adjoining uses that provide services, shopping, and connecting pathways for access to the greater community area.

Table A-1: General Plan Objectives and Policies

Urban Form Element (Continued)	
Policy UF-14-c	Block Length. Create development standards that provide desired and maximum block lengths in residential, retail, and mixed-use districts order to enhanced walkability.
Land Use Element	
Objective LU-2	Plan for infill development that includes a range of housing types, building forms, and land uses to meet the needs of both current and future residents.
Policy LU-2-a	Infill Development and Redevelopment. Promote development of vacant, underdeveloped, and redevelopable land within the City Limits where urban services are available by considering the establishment and implementation of supportive regulations and programs.
Policy LU-2-b	Infill Development for Affordable Housing. Establish a priority infill incentive program for residential infill development of existing vacant lots and underutilized sites within the City as a strategy to help to meet the affordable housing needs of the community.
Policy LU-3-b	Mixed-Use Urban Corridors that Connect the Downtown Planning Area. Support the development of mixed-use urban corridors that connect the Downtown Planning Area with the greater Fresno-Clovis Metropolitan Area with functional, enduring, and desirable urban qualities along the Blackstone Avenue, Shaw Avenue, California Avenue, and Ventura Avenue/Kings Canyon corridors, as shown on Figure LU-1: General Plan Land Use Diagram.
Policy LU-3-c	Zoning for High Density on Major BRT Corridors. Encourage adoption of supportive zoning regulations for compact development along BRT corridors leading to the Downtown Core that will not diminish long-term growth and development potential for Downtown.
Policy LU-5-f	High Density Residential Uses. Promote high-density residential uses to support Activity Centers and BRT corridors, and walkable access to transit stops.
Design Element	
Policy D-3-c	Local Streets as Urban Parkways. Develop local streets as "urban parkways", where appropriate, with landscaping and pedestrian spaces.
Policy D-4-b	Incentives for Pedestrian-Oriented Anchor Retail. Consider adopting and implementing incentives for new pedestrian-friendly anchor retail at intersections within Activity Centers and along corridors to attract retail clientele and maximize foot traffic.
Transportation Element	
Policy MT-1-h	Update Standards for Complete Streets. Update the City's Engineering and Street Design Standards to ensure that roadway and streetscape design specifications reflect the Complete Streets concept, while also addressing the needs of through traffic, transit stops, bus turnouts, passenger loading needs, bike lanes, pedestrian accommodation, and short- and long-term parking.
Policy MT-1-i	Local Street Standards. Establish and implement local roadway standards addressing characteristics such as alignment, width, continuity and traffic calming, to provide efficient neighborhood circulation; to allow convenient access by residents, visitors, and public service and safety providers; and to promote neighborhood integrity and desired quality of life by limiting intrusive pass-through traffic.
Policy MT-1-j	Transportation Improvements Consistent with Community Character. Prioritize transportation improvements that are consistent with the character of surrounding neighborhoods and supportive of safe, functional and Complete Neighborhoods; minimize negative impacts upon sensitive land uses such as residences, hospitals, schools, natural habitats, open space areas, and historic and cultural resources. In implementing this policy, the City will design improvements to: <ul style="list-style-type: none"> ● Facilitate provision of multi-modal transportation opportunities; ● Provide added safety, including appropriate traffic calming measures; ● Promote achievement of air quality standards; ● Provide capacity in a cost effective manner; and ● Create improved and equitable access with increased efficiency and connectivity.
Objective MT-4	Establish and maintain a continuous, safe, and easily accessible bikeways system throughout the metropolitan area to reduce vehicle use, improve air quality and the quality of life, and provide public health benefits.
Policy MT-4-a	Active Transportation Plan. To the extent consistent with this General Plan, continue to implement and periodically update the Active Transportation Plan to meet State standards and requirements for recommended improvements and funding proposals as determined appropriate and feasible

Table A-1: General Plan Objectives and Policies

Transportation Element (Continued)	
Policy MT-4-b	Bikeway Improvements. Establish and implement property development standards to assure that projects adjacent to designated bikeways provide adequate right-of-way and that necessary improvements are constructed to implement the planned bikeway system shown on Figure MT-2 to provide for bikeways, to the extent feasible, when existing roadways are reconstructed; and alternative bikeway alignments or routes where inadequate right-of-way is available
Policy MT-4-c	Bikeway Linkages. Provide linkages between bikeways, trails and paths, and other regional networks such as the San Joaquin River Trail and adjacent jurisdiction bicycle systems wherever possible.
Objective MT-5	Establish a well-integrated network of pedestrian facilities to accommodate safe, convenient, practical, and inviting travel by walking, including for those with physical mobility and vision impairments.
Policy MT-5-a	Sidewalk Development. Pursue funding and implement standards for development of sidewalks on public streets, with priority given to meeting the needs of persons with physical and vision limitations; providing safe routes to school; completing pedestrian improvements in established neighborhoods with lower vehicle ownership rates; or providing pedestrian access to public transportation routes.
Policy MT-5-e	Traffic Management in Established Neighborhoods. Establish acceptable design and improvement standards and provide traffic planning assistance to established neighborhoods to identify practical traffic management and calming methods to enhance the pedestrian environment with costs equitably assigned to properties receiving the benefits or generating excessive vehicle traffic.
Objective MT-6	Establish a network of multi-purpose pedestrian and bicycle paths, as well as limited access trails, to link residential areas to local and regional open spaces and recreational areas and urban Activity Centers in order to enhance Fresno's recreational amenities and alternative transportation options.
Policy MT-6-a	Link Residences to Destinations. Design a pedestrian and bicycle path network that links residential areas with Activity Centers, such as parks and recreational facilities, educational institutions, employment centers, cultural sites, and other focal points of the city environment.
Policy MT-6-g	Path and Trail Development. Require all projects to incorporate planned multi-purpose path and trail development standards and corridor linkages consistent with the General Plan, applicable law and case-by-case determinations as a condition of project approval.
Objective MT-8	Provide public transit options that serve existing and future concentrations of residences, employment, recreation and civic uses and are feasible, efficient, safe, and minimize environmental impacts.
Policy MT-8-a	Street Design Coordinated with Transit. Coordinate the planning, design, and construction of the major roadway network with transit operators to facilitate efficient direct transit routing throughout the Planning Area.
Policy MT-8-b	Transit Serving Residential and Employment Nodes. Identify the location of current and future residential and employment concentrations and Activity Centers throughout the transit service area in order to facilitate planning and implementation of optimal transit service area in order to facilitate planning and implementation of optimal transit services for these uses. Work with California State University, Fresno to determine locations within the campus core for bus stops.
Policy MT-8-g	High Speed Train. If the State moves forward with HST, ensure it is constructed through Fresno in a manner that minimizes impacts to surrounding property owners and creates the most opportunity for redevelopment around the HST station.
Objective MT-9	Provide public transit opportunities to the maximum number and diversity of people practicable in balance with providing service that is high in quality, convenient, frequent, reliable, cost-effective and financially feasible.
Policy MT-10-a	Updating Parking Standards. Update off-street parking standards to reflect the context and location within activity areas of multiple uses and reductions appropriate for mixed residential and non-residential uses and proximity to existing or planned transit service.
Policy MT-10-b	Shared Parking. Establish a strategy to promote the sharing of excess parking between uses within Activity Centers and BRT corridors, including specific provisions for this in the Development Code.
Policy MT-10-c	Transportation Demand Management Guidelines. Establish transportation demand management guidelines to allow for reduced off-street parking requirements.

Table A-1: General Plan Objectives and Policies

Transportation Element (Continued)	
Policy MT-10-d	Parking Maximums. Explore maximum off-street parking limits within Activity Centers proximate to BRT corridors, if such an Activity Center is determined compatible with promotion of a healthy and vigorous business environment.
Policy MT-10-f	Parking Benefit Districts. Establish parking benefit districts to fund consolidated public parking where supported by local businesses.
Park and Open Space	
Policy POSS-1-g	Regional Urban Forest. Maintain and implement incrementally, through new development projects, additions to Fresno’s regional urban forest to delineate corridors and the boundaries of urban areas, and to provide tree canopy for bike lanes, sidewalks, parking lots, and trails.
Policy POSS-7-h	Interlink City and San Joaquin River Parkway Trail Networks. Strive to connect the parkway trail network to other trails in the vicinity, in order to create a community and regional trail system that offers a variety of different route combinations and enhances public access to the parkway.
Public Utilities	
Objective PU-7	Promote reduction in wastewater flows and develop facilities for beneficial reuse of reclaimed water and biosolids for management and distribution of treated wastewater.
Policy PU-7-a	Reduce Wastewater. Identify and consider implementing water conservation standards and other programs and policies, as determined and appropriate, to reduce wastewater flows.
Policy PU-7-d	Wastewater Recycling. Pursue the development of a recycled water system and the expansion of beneficial wastewater recycling opportunities, including a timely technical, practicable, and institutional evaluation of treatment, facility siting, and water exchange elements.
Policy PU-9-a	New Techniques. Continue to collaborate affected stakeholders and partners to identify and support programs and new techniques of solid waste disposal, such as recycling, composting, waste to energy technology, and waste separation, to reduce the volume and toxicity of solid wastes that must be sent to landfill facilities.
Policy PU-9-b	Compliance with State Law. Continue to pursue programs to maintain conformance with the Solid Waste Management Act of 1989 or as otherwise required by law and mandated diversion goals.
Resource Conservation and Resilience	
Objective RC-2	Promote land uses that conserve resources
Policy RC-2-a	Link Land Use to Transportation. Promote mixed-use, higher density infill development in multi-modal corridors. Support land use patterns that make more efficient use of the transportation system and plan future transportation investments in areas of higher-intensity development. Discourage investment in infrastructure that would not meet these criteria.
Policy RC-2-b	Provide Infrastructure for Mixed-Use and Infill. Promote investment in the public infrastructure needed to allow mixed-use and denser infill development to occur in targeted locations, such as expanded water and wastewater conveyance systems, complete streetscapes, parks and open space amenities, and trails. Discourage investment in infrastructure that would not meet these criteria.
Policy RC-4-i	Methane Capture. Continue to pursue opportunities to reduce air pollution by using methane gas from the old City landfill and the City’s wastewater treatment process.
Objective RC-5	In cooperation with other jurisdictions and agencies in the San Joaquin Valley Air Basin, take timely, necessary, and the most cost-effective actions to achieve and maintain reductions in greenhouse gas emissions and all strategies that reduce the causes of climate change in order to limit and prevent the related potential detrimental effects upon public health and welfare of present and future residents of the Fresno community.
Policy RC-5-a	Support State Goal to Reduce Statewide GHG Emissions. As is consistent with State law, strive to meet AB 32 goal to reduce greenhouse gas emissions to 1990 levels by 2020 and strive to meet a reduction of 80 percent below 1990 levels by 2050 as stated in Executive Order S-03-05. As new statewide GHG reduction targets and dates are set by the State update the City’s Greenhouse Gas Reduction Plan to include a comprehensive strategy to achieve consistency with those targets by the dates established.

Table A-1: General Plan Objectives and Policies

Resource Conservation and Resilience (Continued)	
Policy RC-5-b	<p>Greenhouse Gas Reduction Plan. As is consistent with State law, prepare and adopt a Greenhouse Gas Reduction Plan as part of the Master Environmental Impact Report to be concurrently approved with the Fresno General Plan in order to achieve compliance with State mandates, assist development by streamlining the approval process, and focus on feasible actions the City can take to minimize the adverse impacts of growth and development on global climate change. The Greenhouse Gas Reduction Plan shall include, but not be limited to:</p> <ul style="list-style-type: none"> ● A baseline inventory of all known or reasonably discoverable sources of GHGs that currently exist in the city and sources that existed in 1990. ● A projected inventory of the GHGs that can reasonably be expected to be emitted from those sources in the year 2035 with implementation of this General Plan and foreseeable communitywide and municipal operations. ● A target for the reduction of emissions from those identified sources. ● A list of feasible GHG reduction measures to meet the reduction target, including energy conservation and “green building” requirements in municipal buildings and private development. ● Periodically update municipal and community-wide GHG emissions inventories to determine the efficacy of adopted measures and to guide future policy formulation needed to achieve and maintain GHG emissions reduction targets.
Policy RC-5-c	<p>GHG Reduction through Design and Operations. Increase efforts to incorporate requirements for GHG emission reductions in land use entitlement decisions, facility design, and operational measures subject to City regulation through the following measures and strategies:</p> <ul style="list-style-type: none"> ● Promote the expansion of incentive-based programs that involve certification of projects for energy and water efficiency and resiliency. These certification programs and scoring systems may include public agency “Green” and conservation criteria, Energy Star™ certification, CALGreen Tier 1 or Tier 2, Leadership in Energy Efficient Design (LEED™) certification, etc. ● Promote appropriate energy and water conservation standards and facilitate mixed-use projects, new incentives for infill development, and the incorporation of mass transit, bicycle and pedestrian amenities into public and private projects. ● Require energy and water audits and upgrades for water conservation, energy efficiency, and mass transit, pedestrian, and bicycle amenities at the time of renovation, change in use, change in occupancy, and change in ownership for major projects meeting review thresholds specified in an implementing ordinance. ● Incorporate the City’s “Guidelines for Ponding Basin/Pond Construction and Management to Control Mosquito Breeding” as conditions of approval for any project using an on-site stormwater basin to prevent possible increases in vector-borne illnesses associated with global climate change. ● Periodically evaluate the City’s facility maintenance practices to determine whether there are additional opportunities to reduce GHGs through facility cleaning and painting, parks maintenance, road maintenance, and utility system maintenance. ● Periodically evaluate standards and mitigation strategies for highly vehicle-dependent land uses and facilities, such as drive-through facilities and auto-oriented development.
Policy RC-5-d	<p>SCS and CAP Conformity Analysis. Ensure that the City includes analysis of a project’s conformity to an adopted regional Sustainable Community Strategy or Alternative Planning Strategy (APS), an adopted Climate Action Plan (CAP), and any other applicable City and regional greenhouse gas reduction strategies in affect at the time of project review.</p>
Policy RC-5-e	<p>Ensure Compliance. Ensure ongoing compliance with GHG emissions reduction plans and programs by requiring that air quality measures are incorporated into projects’ design, conditions of approval, and mitigation measures.</p>
Policy RC-5-f	<p>Toolkit. Provide residents and project applicants with a “toolkit” of generally feasible measures that can be used to reduce GHG emissions, including educational materials on energy-efficient and “climate-friendly” products.</p>
Policy RC-5-g	<p>Evaluate Impacts with Models. Continue to use computer models such as those used by SJVAPCD to evaluate greenhouse gas impacts of plans and projects that require such review.</p>
Policy RC-6-d	<p>Recycled Water. Prepare, adopt, and implement a City of Fresno Recycled Water Master Plan.</p>

Table A-1: General Plan Objectives and Policies

Resource Conservation and Resilience (Continued)	
Objective RC-7	Promote water conservation through standards, incentives and capital investments.
Policy RC-7-a	<p>Water Conservation Program Target. Maintain a comprehensive conservation program that reduces per capita water usage in the city’s water service area to 243 gallons per capita per day (gpcd) by 2020 and 190 gpcd by 2035, by adopting conservation standards and implementing a program of incentives, design and operation standards, and user fees.</p> <ul style="list-style-type: none"> ● Support programs that result in decreased water demand, such as landscaping standards that require drought-tolerant plants, rebates for water conserving devices and systems, turf replacement, xeriscape landscape for new homes, irrigation controllers, commercial/industrial/institutional water conserving programs, prioritized leak detection program, complete water system audit, landscape water audit and budget program, and retrofit upon resale ordinance. ● Implement the U.S. Bureau of Reclamation Best Management Practices for water conservation as necessary to maintain the City’s surface water entitlements. ● Adopt and implement policies in the event an artificial lake is proposed for development. ● Work cooperatively toward effective uniform water conservation measures that would apply throughout the Planning Area. ● Expand efforts to educate the public about water supply issues and water conservation techniques.
Policy RC-7-c	Best Practices for Conservation. Require all City facilities and all new private development to follow U.S. Bureau of Reclamation Best Management Practices for water conservation, as warranted and appropriate
Policy RC-7-d	Update Standards for New Development. Continue to refine water saving and conservation standards for new development
Policy RC-7-e	Retrofit City Facilities, and Consider Incentives Programs to Encourage Retrofitting of Other Existing Public and Private Residential and Non-Residential Facilities and Sites. Reduce water use in municipal buildings and City operations by developing a schedule and budget for the retrofit of existing municipal buildings with water conservation features, such as auto shut-off faucets and water saving irrigation systems. Prepare a comprehensive incentive program for other existing public and private residential and non-residential buildings and irrigation systems.
Policy RC-7-f	Implementation and Update Conservation Program. Continue to implement the City of Fresno Water Conservation Program, as may be updated, and periodically update restrictions on water uses, such as lawn and landscape watering and the filling of fountains and swimming pools, and penalties for violations. Evaluate the feasibility of a 2035 conservation target of 190 gpcd in the next comprehensive update of the City of Fresno Water Conservation Program.
Policy RC-7-g	Educate on State Requirements. Educate the residents and businesses of Fresno on the requirements of the California Water Conservation Act of 2009.
Policy RC-7-h	<p>Landscape Water Conservation Standards. Refine landscape water conservation standards that will apply to new development installed landscapes, building on the State Model Water Efficient Landscape Ordinance and other State regulations.</p> <ul style="list-style-type: none"> ● Evaluate and apply, as appropriate, augmented xeriscape, “water- wise,” and “green gardening” practices to be implemented in public and private landscaping design and maintenance. ● Facilitate implementation of the State’s Water Efficient Landscape Ordinance by developing alternative compliance measures that are easy to understand and observe.
Policy RC-7-i	PACE Financing. Develop a residential Property Assessed Clean Energy (PACE) program, if it is determined to be a feasible option, to help finance water efficiency and energy efficiency upgrades for property owners.
Objective RC-8	Reduce the consumption of non-renewable energy resources by requiring and encouraging conservation measures and the use of alternative energy sources.
Policy RC-8-a	Existing Standards and Programs. Continue existing beneficial energy conservation programs, including adhering to the California Energy Code in new construction and major renovations.
Policy RC-8-b	Energy Reduction Targets. Strive to reduce per capita residential electricity use to 1,800 kWh per year and nonresidential electricity use to 2,700 kWh per year per capita by developing and implementing incentives, design and operation standards, promoting alternative energy sources, and cost-effective savings.

Table A-1: General Plan Objectives and Policies

Resource Conservation and Resilience (Continued)	
Policy RC-8-c	Energy Conservation in New Development. Consider providing an incentive program for new buildings that exceed California Energy Code requirements by fifteen percent.
Policy RC-8-d	Incentives. Establish an incentive program for residential developers who commit to building all of their homes to ENERGY STAR performance guidelines.
Policy RC-8-e	Energy Use Disclosure. Promote compliance with State law mandating disclosure of a building's energy data and rating of the previous year to prospective buyers and lessees of the entire building or lenders financing the entire building.
Policy RC-8-f	City Heating and Cooling. Reduce energy use at City facilities by updating heating and cooling equipment and installing "smart lighting" where feasible and economically viable.
Policy RC-8-g	Revolving Energy Fund. Create a City Energy Fund which uses first year savings and rebates from completed City-owned energy efficiency projects to provide resources for additional energy projects. Dedicate this revolving fund to the sole use of energy efficiency projects that will pay back into the fund.
Policy RC-8-h	Solar Assistance. Identify and publicize information about financial mechanisms for private solar installations and provide over-the-counter permitting for solar installations meeting specified standards, which may include maximum size (in kV) of units that can be so approved.
Policy RC-8-j	Alternative Fuel Network. Support the development of a network of integrated charging and alternate fuel station for both public and private vehicles, and if feasible, open up municipal stations to the public as part of network development.
Policy RC-8-k	Energy Efficiency Education. Provide long-term and ongoing education of homeowners and businesses as to the value of energy efficiency and the need to upgrade existing structures on the regular basis as technology improves and structures age.
Policy RC-11-a	<p>Waste Reduction Strategies. Maintain current targets for recycling and re- use of all types of waste material in the city and enhance waste and wastewater management practices to reduce natural resource consumption, including the following measures:</p> <ul style="list-style-type: none"> ● Continue to require recyclable material collection and storage areas in all residential development. ● Establish recycling collection and storage area standards for commercial and industrial facilities to size the recycling areas according to the anticipated types and amounts of recyclable material generated. ● Provide educational materials to residents on how and what to recycle and how to dispose of hazardous waste. ● Provide recycling canisters and collection in public areas where trash cans are also provided. ● Institute a program to evaluate major waste generators and identify recycling opportunities for their facilities and operations. ● Continue to partner with the California Integrated Waste Management Board on waste diversion and recycling programs and the CalMax (California Materials Exchange) program. ● Evaluate the feasibility of a residential, restaurant and institutional food waste segregation and recycling program, to reduce the amount of organic material sent to landfill and minimize the emissions generated by decomposing organic material. ● Evaluate the feasibility of "carbon footprinting" for the City's wastewater treatment facilities, biomass and composting operations, solid waste collection and recycling programs. ● Expand yard waste collection to divert compostable waste from landfills. ● Study the feasibility and cost-benefit analysis of a municipal composting program to collect and compost food and yard waste, including institutional food and yard waste, using the resulting compost matter for City park and median maintenance.
Policy RC-11-b	Zero Waste Strategy. Create a strategic and operations plan for fulfilling the City Council resolution committing the City to a Zero Waste goal.

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APPENDIX B

GHG REDUCTION PLAN UPDATE: PROJECT CONSISTENCY CHECKLIST

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FRESNO GREENHOUSE GAS (GHG) REDUCTION PLAN UPDATE

CEQA PROJECT CONSISTENCY CHECKLIST

March 2020



Fresno Greenhouse Gas (GHG) Reduction Plan Update – CEQA Project Consistency Checklist

INTRODUCTION

The City of Fresno updated its 2014 Greenhouse Gas (GHG) Reduction Plan (the Plan) in the year 2020 to conform with existing applicable State climate change policies and regulations. The GHG Plan Update outlines strategies that the City will undertake to achieve its proportional share of GHG emission reductions. The purpose of this GHG Reduction Plan Update Consistency Checklist (Checklist) is to help the City provide a streamlined review process for new development projects that are subject to discretionary review pursuant to the California Environmental Quality Act (CEQA) Guidelines Section 15183.5.

This Checklist has been developed as part of the GHG Plan Update implementation and monitoring process and will support the achievement of individual GHG reduction strategies as well as the City's overall GHG reduction goals. In addition, this Checklist will further the City's sustainability goals and policies that encourage sustainable development and aim to conserve and reduce the consumption of resources, such as energy and water. Projects that meet the requirements of this Checklist will be deemed to be consistent with the Fresno GHG Reduction Plan Update and will be found to have a less than significant contribution to cumulative GHG (i.e., the project's incremental contribution to cumulative GHG effects is not cumulatively considerable), pursuant to CEQA Guidelines Sections 15064(h)(3), 15130(d), and 15183(b). Projects that do not meet the requirements in this Checklist will be deemed to be inconsistent with the Fresno GHG Reduction Plan Update and must prepare a project-specific analysis of GHG emissions, including quantification of existing and projected GHG emissions and incorporation of the measures in this Checklist to the extent feasible. This GHG Checklist can be updated to reflect adoption of new GHG reduction strategies or to comply with any changes and updates in the Plan or local, State or federal regulations. Note that not all the measures in the checklist are applicable to all projects. The projects should comply with applicable measures from the checklist.

1. Project Information	
Contact Information	
Project No./Name:	
Address:	
Applicant Name/Co:	
Contact Information:	
Project Information	
1. What is the Site acreage of the Project?	
2. Identify all Applicable Proposed Land uses:	
a. Residential (Indicate number of single-family units)	
b. Residential (Indicate number of multi-family units)	
c. Commercial (total square footage)	
d. Industrial (total square footage)	
e. Other (describe)	
3. Is the project or a portion of the project located in a transit priority area? (Y/N)	
4. Provide a brief description of the project proposed:	

2. Determining Land Use Consistency		
Checklist Item		
<p>As the first step in determining the consistency with the GHG Reduction Plan for discretionary development projects, this section allows the City to determine the project’s consistency with the land use assumptions used in the GHG Reduction Plan.</p>		
	Yes	No
<p>1. Is the proposed project consistent with the approved General Plan, Specific Plan, and Community Plan planned land use and zoning designations?</p> <p>If the answer is Yes, then proceed to the GHG Plan Update Consistency Checklist.</p> <p>If the answer is No, then proceed to question 2.</p>		
<p>2. If the proposed project is not consistent with the approved planned land use and zoning designation(s), then provide estimated GHG project emissions under both existing and proposed designation(s) for comparison. Compare the maximum buildout of the existing designation with the maximum buildout of the proposed designation.</p> <p>If the estimated project emissions at maximum buildout of the proposed designation(s) is equivalent to or less than the estimated project emissions at maximum buildout of the existing designation(s), then in accordance with the City’s Significance Determination Thresholds, the project’s GHG impact is less than significant. If there is a proposed development project associated with this plan amendment and or rezone then complete the GHG Plan Update Consistency Checklist and incorporate applicable measures, otherwise there is no further step required.</p> <p>If the estimated project emission at maximum buildout of the proposed designation(s) is greater than the estimated project emissions at maximum buildout of the existing designation(s), then in accordance with the City’s Significance Determination Thresholds, the project’s GHG impact is significant. The project must either show consistency with applicable GP objectives and policies (provide applicable GP objectives and policies here) or provide analysis and measures to incorporate into the project to bring the GHG emissions to a level that is less than or equal to the estimated project emission at maximum buildout of the existing designation(s) unless the decision-maker finds that a measure is infeasible in accordance with CEQA Guidelines Section 15091. If there is a proposed development project associated with this plan amendment and or rezone then complete the GHG Plan Update Consistency Checklist and incorporate applicable measures, otherwise there is no further step required.</p>		

3. Greenhouse Gas (GHG) Reduction Plan Update - CEQA Project Consistency Checklist

GHG Plan Update consistency review involves the evaluation of project consistency with the applicable strategies of the GHG Plan Update. This checklist was developed based on the key local GHG reduction strategies and actions identified in the GHG Plan Update that are applicable to new development projects.

Checklist Item (Check the appropriate box and provide an explanation for your answer)	Yes	No	Not Applicable (NA)	Explanation
Strategy 1: Land Use and Transportation Demand Management				
Does the project provide complete streets for all roadway improvements? (Complete streets are roadways that include curb, gutter, and sidewalks on both sides of the street. For local and collector streets, adequate roadway width is provided to accommodate two-way vehicle traffic and bicycles and arterial streets include striping for bike lanes.)				
Is the project a large employer (over 100 employees) and if so will the project comply with SJVAPCD Rule 9410 and provide an Employer Trip Reduction Implementation Plan that will include trip reduction methods such as increasing transit use, carpooling, vanpooling, bicycling, or other measures? See the SJVAPCD website link for details: https://www.valleyair.org/rules/currentrules/r9410.pdf				
Strategy 2: Energy Conservation and Renewable Energy				
Does the project meet the mandatory energy efficiency measures of the California Green Building Standards Code (CalGreen)? If the Project exceeds mandatory CalGreen measures then provide the tier number that the project will meet in the explanation.	X			
For commercial projects, does it achieve net zero electricity? Mark NA if project will be permitted before 2030. Mark Yes if voluntary. Add source and capacity in explanation.				
Does the project include onsite energy generation using renewable energy? If no, mark NA. If yes, provide source and capacity in the explanation.				
Strategy 3: Water Conservation				
Does the project meet the mandatory indoor water use measures of the CalGreen Code? If the project exceeds CalGreen Code mandatory measures provide methods in excess of requirements in the explanation. Examples may include water pipe insulation, pressure reducing valves, energy efficient appliances such as Energy Star Certified dishwashers, washing machines, dual flush toilets, point of use and/or tankless water heaters. Provide the measures, devices, or systems that the project will include in the explanation.	X			
Does the project meet the mandatory outdoor water use measures of the CalGreen Code? If the project exceeds CalGreen Code mandatory measures provide methods in excess of requirements in the explanation? Examples may include any outdoor water conservation measures such as; drought tolerant landscaping plants, compliant irrigation systems, xeriscapes etc. Provide the conservation measure that the project will include in the explanation.	X			
Strategy 4: Solid Waste Diversion and Recycling				
When completed will the project implement techniques for solid waste diversion and reduction (i.e., recycling, composting, waste to energy technology, waste separation)?	X			
During construction will the project recycle construction and demolition waste?	X			

APPENDIX C

GHG REDUCTION MEASURES FUNDING SOURCES

Implementation of the local GHG reduction strategies may require investment for the capital improvements and other investments, and increased operations and maintenance costs. However, in some cases, operating costs are anticipated to decrease, resulting in offset savings. Table C-1 presents a summary of potential funding and financing options available at the time of writing this document.

Table C-1: Potential Funding Sources to Support GHG Reduction Strategies

Funding Source	Description
State and Federal Funds	
Federal Tax Credits for Energy Efficiency	<ul style="list-style-type: none"> ● Tax credits for energy efficiency can be promoted to residents.
Energy Efficient Mortgages (EEM)	<ul style="list-style-type: none"> ● An EEM is a mortgage that credits a home’s energy efficiency in the mortgage itself. ● Residents can finance energy-saving strategies as part of a single mortgage. ● To verify a home’s energy efficiency, an EEM typically requires a home energy rating of the house by a home energy rater before financing is approved. ● EEMs are typically used to purchase a new home that is already energy efficient, such as an ENERGY STAR®-qualified home.
California Department of Resources Recycling and Recovery (CalRecycle)	<ul style="list-style-type: none"> ● CalRecycle grant programs allow jurisdictions to assist public and private entities in management of waste streams. ● Incorporated cities and counties in California are eligible for funds. ● Program funds are intended to: <ul style="list-style-type: none"> ● Reduce, reuse, and recycle all waste ● Encourage development of recycled-content products and markets ● Protect public health and safety and foster environmental sustainability
California Energy Commission (CEC)	<ul style="list-style-type: none"> ● CEC has energy efficiency financing options for projects with proven energy savings. These options include 0% interest rate loans for K–12 school districts, county offices of education, State special schools, community colleges, and 1% interest rate loans for cities, counties, special districts, public colleges or universities, public care institutions/public hospitals, University of California campuses, and California State University campuses. ● Projects eligible for the CEC energy efficiency financing low interest loans include: <ul style="list-style-type: none"> ● Lighting system upgrades ● Pumps and motors ● Streetlights and light-emitting diode (LED) traffic signals ● Building insulation ● Heating, ventilation and air conditioning equipment ● Water and waste water treatment equipment
California Air Resources Board (CARB)	<ul style="list-style-type: none"> ● CARB offers several grants, incentives, and credits programs to reduce on-road and off-road transportation emissions. Residents, businesses, and fleet operators can receive funds or incentives depending on the program. ● The following programs can be utilized to fund local strategies: <ul style="list-style-type: none"> ● Air Quality Improvement Program (Assembly Bill 118) ● Carl Moyer Program – Voucher Incentive Program ● Goods Movement Emission Reduction Program (Proposition 1B Incentives) ● Loan Incentives Program ● Lower-Emission School Bus Program/School Bus Retrofit and Replacement Account (Proposition 1B and United States Environmental Protection Agency Incentives)

Table C-1: Potential Funding Sources to Support GHG Reduction Strategies

Funding Source	Description
Existing Capital Improvement Program	<ul style="list-style-type: none"> ● State and federal funds would most likely continue to local governments, builders, and homeowners in the following forms: ● Grants ● Transportation and transit funding ● Tax credit and rebate programs ● The Capital Improvement Program can be used for strategies relating to traffic or transit.
State Funding for Infrastructure	<ul style="list-style-type: none"> ● The State’s Infill Infrastructure Grant Program may potentially be used to help fund strategies that promote infill housing development. ● Grants can be used for gap funding for infrastructure improvements necessary for specific residential or mixed-use infill development projects.
Transportation-Related Federal and State Funding	<ul style="list-style-type: none"> ● For funding strategies related to transit, bicycle, or pedestrian improvements, the following funding sources from SCAG may be used: <ul style="list-style-type: none"> ○ Sustainability Planning Grant ○ California Active Transportation Program ○ Caltrans Transportation Planning Grant Program provides funding that would lead to programming and implementation of transportation improvement projects. ○ Sustainable Communities Grants ○ Strategic Partnerships Grants ○ Adaptation Planning Grants
Utility Rebates	<ul style="list-style-type: none"> ● Department of Water and Power offers a variety of residential and commercial rebate programs: <ul style="list-style-type: none"> ○ Residential and Commercial Turf Replacement Program ○ Pool/Spa Cover Rebates ○ Rebates for Water-Efficient Devices ○ Recirculating Pump Rebate ○ Free Urinal Flush Valve Upgrades and Installation ○ Pacific Gas and Electric Company (PG&E) is one of the utilities participating in the California Solar Initiative. ○ A variety of rebates are available for existing and new homes. ○ Photovoltaics, thermal technologies, and solar hot water projects are eligible. ○ Single-family homes, commercial development, and affordable housing are eligible.
Energy Upgrade California	<ul style="list-style-type: none"> ● The program is intended for home energy upgrades. ● Funding comes from the American Recovery and Reinvestment Act, California utility ratepayers, and private contributions. ● Utilities administer the program, offering homeowners the choice of one of two upgrade packages—basic or advanced. ● Homeowners are connected to home energy professionals. ● Rebates, incentives, and financing are available. ● Homeowners can receive up to \$4,000 back on an upgrade through the local utility.
Private Funding	
Private Funding	<ul style="list-style-type: none"> ● Private equity can be used to finance energy improvements, with returns realized as future cost savings. ● Rent increases can fund retrofits in commercial buildings. ● Net energy cost savings can fund retrofits in households. ● Power Purchase Agreements involve a private company that purchases, installs, and maintains a renewable energy technology through a contract that typically lasts 15 years. After 15 years, the company would uninstall the technology or sign a new contract. ● On-Bill Financing (OBF) can be promoted to businesses for energy-efficiency retrofits. OBF funding is a no-interest loan that is paid back through monthly utility bills. Lighting, refrigeration, HVAC, and LED streetlights are all eligible projects.

Table C-1: Potential Funding Sources to Support GHG Reduction Strategies

Funding Source	Description
Other Funding Mechanisms for Implementation	
Other Funding	<ul style="list-style-type: none"> Increased operating costs can be supported by grants from the Strategic Growth Council or the State Department of Conservation to fund sustainable community planning, natural resource conservation and development, and adoption.
Future Funding Options: Funding Mechanisms for Capital and/or Implementation Costs	
New Development Impact Fees	<ul style="list-style-type: none"> These types of fees may have some potential to provide funding, but such fees are best implemented when the real estate market and overall regional economic conditions are strong.
General Obligation Bond	<ul style="list-style-type: none"> A general obligation bond is a form of long-term borrowing and could be used to fund municipal improvements.

Source: Compiled by LSA Associates, Inc. (2019).
HVAC = heating, ventilation, and air conditioning

In addition to pursuing the funding options above and monitoring the availability of others, the City should take the following steps to best inform decisions related to the cost of GHG reduction strategies:

- Perform and Refine Cost Estimates:** Cost estimates for local reduction strategies should be performed to identify the cost-effectiveness of each strategy to inform and to guide the implementation process. This analysis will likely be based on a variety of participation, per-unit, and other assumptions. As programs are developed, cost estimates should be refined and updated over time with more precise implementation-level data.
- Integrate GHG Reduction into Existing City Budget and Capital Improvements Program:** Certain capital improvements may need to be added to the City’s Capital Improvements Program (CIP) and facility master plan programs, as well as those of the City utility enterprises and other public agencies that have control for project implementation. For CIPs completely under the City’s control, new projects would need to be assessed for consistency with the GHG Plan Update.
- Adopt or Update Ordinances and/or Codes:** Some local reduction strategies may require new or revised ordinances. Staff would need to coordinate these efforts in conjunction with planning departments, planning commissions, and City councils.
- Pursue Outside Funding Sources:** A range of funding from State and federal agencies has been identified. The City would need to pursue these (and other emerging) funding sources as a part of implementation efforts.
- Implement and Direct Preferred City Funding Sources:** While City funding sources are limited, the City, when financially able, as a part of its budget process, could appropriate funding from general sources or make changes in its fee schedules, utility rates, and other sources as needed to support funding the implementation of the GHG reduction strategies.
- Create Monitoring/Tracking Processes:** Local reduction strategies would require program development, tracking, and/or monitoring.

Identify Economic Indicators to Consider Future Funding Options: Economic recovery may occur rapidly or slowly. Whatever the timeframe, the City would need to determine the point at which

certain additional funding sources may become feasible and/or favorable. Identification and monitoring of economic indicators and trends, such as home prices, energy prices, cost per kWh on solar installations, unemployment rates, or real wage increases, can help the City decide when to further explore the potential for funding local reduction strategies through different financing mechanisms.

To encourage implementation of all reduction strategies, City staff could develop a GHG Plan Update Implementation Timeline. GHG reduction Strategy prioritization could be based on the following factors:

- **Cost/Funding:** How much does the strategy cost? Is funding already in place for the strategy?
- **Greenhouse Gas Reductions:** How effective is the strategy at reducing greenhouse gases?
- **Other Benefits:** For example, does the strategy improve water quality or conserve resources? Would it create jobs or enhance community well-being?
- **Consistency with Existing Programs:** Does the strategy complement or extend existing programs?
- **Impact on the Community:** What are the advantages and disadvantages of the strategy to the community as a whole?
- **Speed of Implementation:** How quickly can the strategy be implemented and when would the City begin to see benefits?
- **Implementation Effort:** How difficult will it be to develop and implement the program?

A qualitative appraisal of implementation effort for the City is also provided. Strategies can be categorized based on the convention of low, medium, or high, with low-level strategies requiring the least level of effort by the City and being the most likely to be pursued immediately (i.e., the low-hanging fruit). Sample criteria are shown in Table C-2.

Table C-2: Implementation Matrix

Implementation Effort Level	Sample Criteria
Low	<ul style="list-style-type: none"> ● Requires limited staff resources to develop. ● Existing programs in place to support implementation. ● Required internal and external coordination is limited. ● Required revisions to policy or code are limited.
Medium	<ul style="list-style-type: none"> ● Requires staff resources beyond the typical daily level. ● Policy or code revisions become necessary. ● Internal and external coordination (e.g., with stakeholders, other cities or agencies, or general public) is necessary.
High	<ul style="list-style-type: none"> ● Requires extensive staff time and resources. ● Requires the development of completely new policies or programs and potential changes to the general plan. ● Requires a robust outreach program to alert residents and businesses of program requirements and eligibility. ● Requires regional cooperation and securing long-term funding.

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