City of Moreno Valley
CLIMATE ACTION PLAN

SCREENCHECK DRAFT APPENDICES
March 30, 2021

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MORENO VALLEY
WHERE DREAMS SOAR

Appendix A

Climate Change Informational Resources

Combating climate change requires education and personal action. This section contains resources on climate change and its impacts, calculating individual carbon footprints, and ways to reduce individual carbon footprints.

Education

The evidence is clear that climate change is happening. Humans are largely responsible for recent climate change. International scientific bodies, federal agencies, and state agencies have numerous resources that summarize the current scientific understanding of climate change and the latest projections of climate change impacts.

The Intergovernmental Panel on Climate Change is the leading international body for the assessment of climate change:

- http://www.ipcc.ch/

The National Aeronautics and Space Administration (NASA) has documented recent impacts and future trends of climate change. NASA also provides resources dedicated to teaching children about climate change basics:

- http://climate.nasa.gov/effects
- https://climatekids.nasa.gov/

The U.S. Environmental Protection Agency (U.S. EPA) has information of climate change, and its effects:

- https://www.climate.gov/teaching/resources/climate-change-basics-0

Cal-Adapt, a product of the Public Interest Energy Research (PIER) program, funded by the California Energy Commission, provides California-specific climate change research, including interactive climate tools:

- http://cal-adapt.org/

The California Office of Environmental Health Hazard Assessment (OEHHA) has developed indicators of climate change in California, including indicators describing the disproportionate impacts of climate change on environmental justice communities and California tribes:

- https://oehha.ca.gov/climate-change

Carbon Footprint

A carbon footprint is a measure of the total amount of GHG emissions produced by an individual. It can be thought of as a personal inventory of one's impacts on climate change. There are a number of online calculators that estimate personal carbon footprints. Individuals can use the following carbon footprint calculators as a guide to help reduce personal carbon emissions.

U.S. Environmental Protection Agency (EPA)

- https://www3.epa.gov/carbon-footprint-calculator/

Cool California

- https://coolcalifornia.arb.ca.gov/calculator-households-individuals

Cool Climate Network

- https://coolclimate.org/calculator

Nature Conservancy

- https://www.nature.org/en-us/get-involved/how-to-help/consider-your-impact/carbon-calculator/

Carbon Footprint

- http://www.carbonfootprint.com/calculator1.html

Global Footprint Network

- https://www.footprintnetwork.org/resources/footprint-calculator/

Reducing your Carbon Footprint

Reducing one's personal carbon footprint saves money, decreases impact on the environment, and helps fight climate change. The following links provide resources on changes one can make in his or her day-to-day life to diminish GHG emissions.

U.S Department of Energy: Save energy, save money

- http://energy.gov/energysaver/energy-saver

California Air Resources Board: Low emissions vehicles

- https://ww2.arb.ca.gov/our-work/topics/clean-cars

Carbon Fund: Reduce what you can, offset what you can't

- https://carbonfund.org/reduce/

New York Times: How to Reduce Your Carbon Footprint

- https://www.nytimes.com/guides/year-of-living-better/how-to-reduce-your-carbon-footprint

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Appendix B

Effectiveness of GHG Reduction Strategies

Appendix B provides the GHG reduction strategies established in Tables 4-1 through 4-7 and Table 5-1 of the Climate Action Plan, adding a description of each strategy and evidence of the effectiveness utilized to calculate total emissions reductions. See following page.

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	**Measure**	**Description**	**Evidence of Effectiveness**	**Estimated GHG Emissions Reduction ($MTCO_2e$ per year)**
TRANSPORTATION STRATEGIES				**250,075 $MTCO_2e$**
TR-1	Partner with Moreno Valley Unified School District (MVUSD), Val Verde Unified School District (VVUSD) and Moreno Valley College to establish an online system like 511.org that links employees and guardians of students to provide carpool matching.	This measure is designed to reduce school trip-related transportation emissions by creating an online system that functions as a ridesharing program for Moreno Valley students and parents. A carpool matching program provides additional opportunities for transportation to schools within Moreno Valley for residents who are unable to utilize school bus and local transit services.	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of 7.2 – 15.8 percent reduction in VMT and therefore **7.2 – 15.8 percent** reduction in GHG emissions. Given that this measure is voluntary, **7.2 percent effectiveness is used.**	36,671 $MTCO_2e$
TR-2	Continue to implement a Safer Routes to School program for increased bicycle and pedestrian safety to and from schools.	This measure is designed to reduce school trip-related transportation emissions by continuing to implement the Safe Routes to School program to increase bicycle and pedestrian safety to and from schools. By increasing safety, residents will feel more comfortable choosing alternative transportation options and will reduce school trip-related VMT. There are numerous benefits to Safe Routes To School programs including reduced traffic congestion surrounding schools, increased physical activity for students, improved air quality and reduced fuel consumption from idling vehicles, and increased community involvement.	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of 7.2 – 15.8 percent reduction in VMT and therefore **7.2 – 15.8 percent** reduction in GHG emissions. Given that this measure is voluntary, **7.2 percent effectiveness is used.**	36,671 $MTCO_2e$
TR-3	Establish a goal of achieving a 10 percent increase in alternative mode use by people employed in Moreno Valley, working with businesses with over 50	This measure is designed to reduce employee commute-related transportation emissions by encouraging medium- and large-sized businesses to implement Transportation Demand Management Strategies identified in Connect SoCal. Transportation Demand	The Victoria Transport Policy Institute's TDM Encyclopedia: Energy Conservation and Emissions Reduction Strategies finds that "Commute Trip Reduction programs typically reduce affected commuters' vehicle travel by **5 – 15%** if they rely only on information, and **10 – 30%** if they also	50,932 $MTCO_2e$

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	**Measure**	**Description**	**Evidence of Effectiveness**	**Estimated GHG Emissions Reduction ($MTCO_2e$ per year)**
	employees to implement on a voluntary basis Transportation Demand Management strategies and programs identified in Connect SoCal, the SCAG Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), including but not limited to: implementing commuter benefit programs, promoting telecommuting and alternative work schedule options, and other financial incentives.	Management (TDM) is a set of strategies that aims to reduce the demand for roadway travel, particularly from single-occupancy vehicles (SOV). TDM investments can reduce congestion and shift trips from SOVs to other modes in ways that often cost significantly less than roadway or transit capital expansion projects. TDM strategies add transportation choices that improve sustainability, public health and the quality of life by reducing congestion, air pollution and GHG emissions. When transit ridership, carpooling, bicycling and walking increase, the efficiency of the entire transportation system improves, bringing many benefits to the SCAG region. These benefits can justify relatively modest public expenditures on effectively implemented TDM programs.	include Financial Incentives such as cost-recovery parking pricing or parking cash out." Therefore, implementation of TDM strategies has a range of **5 – 30 percent** effectiveness. Given that this strategy includes financial incentives but applies only to businesses with over 50 employees and is voluntary, **10.0 percent effectiveness is used.**	
TR-4	Create a Transportation Demand Management program for City staff to promote alternative transportation modes and carpooling to the greatest extent possible.	This measure is designed to reduce employee commute-related transportation emissions by creating a Transportation Demand Management program for City staff. This measure is similar to TR-3, but implementation is at the City's discretion.	The Victoria Transport Policy Institute's TDM Encyclopedia: Energy Conservation and Emissions Reduction Strategies finds that "Commute Trip Reduction programs typically reduce affected commuters' vehicle travel by **5 – 15%** if they rely only on information, and **10 – 30%** if they also include Financial Incentives such as cost-recovery parking pricing or parking cash out." Therefore, implementation of TDM strategies has a range of **5 – 30 percent** effectiveness. Given that this strategy may not include financial incentives and applies only to City staff, **5.0 percent effectiveness is used.**	25,466 $MTCO_2e$

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES

ID	Measure	Description	Evidence of Effectiveness	Estimated GHG Emissions Reduction ($MTCO_2e$ per year)
TR-5	Implement trip reduction programs in new residential, commercial, and mixed-use developments.	This measure is designed to ensure that new residential, commercial, and mixed-use developments incorporate commute trip reduction programs. A commute trip reduction program is a multi-strategy program that encompasses a combination of individual measures such as transit fare subsidies, ride-share programs, parking cash-out or priced parking, shuttles, and improved on-side amenities.	The Victoria Transport Policy Institute's TDM Encyclopedia: Energy Conservation and Emissions Reduction Strategies finds that "Commute Trip Reduction programs typically reduce affected commuters' vehicle travel by **5 – 15%** if they rely only on information, and **10 – 30%** if they also include Financial Incentives such as cost-recovery parking pricing or parking cash out." Therefore, implementation of TDM strategies has a range of **5 – 30 percent** effectiveness. Given that this strategy may not include financial incentives and applies only to new development, **5.0 percent effectiveness is used.**	25,466 $MTCO_2e$
TR-6	Advocate for transit service improvements by area transit providers with an emphasis on coordinating public transit schedules and connections and for subsidies for a higher level of transit service and/or more transit passes for residents and/or employees.	This measure is designed to improve transit service and access to transit by coordinating public transit schedules and connections and provide financial subsidies or transit passes to encourage more residents and employees to choose transit over single-occupancy vehicles, thus reducing transportation-related emissions.	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of 0.3 – 20.0 percent reduction in VMT and therefore **0.3 – 20.0 percent** reduction in GHG emissions. Given that this measure would provide financial incentives but would require coordination with transit providers, **1.0 percent effectiveness is used.**	5,093 $MTCO_2e$
TR-7	Secure funding to install electric vehicle recharging stations or other alternative fuel vehicle support infrastructure in existing public and private parking lots.	This measure is designed to expand electric and alternative fuel vehicle infrastructure throughout Moreno Valley to encourage the switch to low or zero-emissions vehicles, thus reducing transportation-related emissions.	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of 0.5 – 12.7 percent reduction in VMT and therefore **0.5 – 12.7 percent** reduction in GHG emissions. Moreno Valley has an existing network of electric vehicle recharging stations and similar policies are included in the City's	64,683 $MTCO_2e$

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	**Measure**	**Description**	**Evidence of Effectiveness**	**Estimated GHG Emissions Reduction ($MTCO_2e$ per year)**
			Energy Efficiency and Climate Action Strategy. Additionally, Moreno Valley Utility is developing a strategic plan that will provide a roadmap for electric vehicle infrastructure and is in the process of creating incentives and rates to encourage EV adoption. Therefore, **12.7 percent effectiveness is used.**	
TR-8	Increase the number of efficient or alternatively fueled vehicles in the City fleet as vehicles are turned over.	This measure is designed to reduce transportation-related emissions associated with the City vehicle fleet by increasing the number of efficient or alternatively fueled vehicles.	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of 0.4 – 20.3 percent reduction in VMT and therefore **0.4 – 20.3 percent** reduction in GHG emissions. Given that this measure depends on the timing of City vehicle turnover, **1.0 percent effectiveness is used.**	5,093 $MTCO_2e$
TR-9	Consider requiring new multi-family residential and mixed use development to reduce the need for external trips by providing useful services/facilities on-site such as an ATM, vehicle refueling, electric vehicle infrastructure, and shopping.	This measure is designed to reduce transportation-related emissions by requiring new multi-family residential and mixed-use development to provide useful services and facilities on-site. Access to necessary services such as an ATM, vehicle refueling, electric vehicle infrastructure, and shopping will encourage residents of these developments to stay local and reduce vehicle trips.	This measure is supportive, and the emissions reduction potential cannot be precisely quantified. Implementation of this measure is likely to result in an unknown reduction in GHG emissions, VMT, and energy consumption.	0 $MTCO_2e$
TR-10	Create at least one day a year when a portion of streets and plazas is designated for pedestrian and/or bicycle access only.	This measure is designed to reduce transportation-related emissions by establishing "open streets" days where a portion of streets and plazas are designated for pedestrian and/or bicycle access only. This measure creates temporary open space, relieves congestion, and fosters community health and community building.	This measure is supportive, and the emissions reduction potential cannot be precisely quantified. Implementation of this measure is likely to result in an unknown reduction in GHG emissions, VMT, and energy consumption.	0 $MTCO_2e$

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	**Measure**	**Description**	**Evidence of Effectiveness**	**Estimated GHG Emissions Reduction ($MTCO_2e$ per year)**
INDUSTRIAL STRATEGIES				**65,628 MTCO2e**
I-1	Actively promote the use of energy-efficient building operations systems in existing and new industrial facilities with the goal of achieving a 40 percent energy reduction in 30 percent of industrial square footage citywide by 2040. Effectiveness should be confirmed through commissioning of new systems.	This measure is designed to reduce emissions from industrial building energy use. Commissioning is a systematic process of ensuring that a building performs according to its design and the occupant's operational needs. Commissioning allows the design developed to be successfully constructed and operated. Examples includes measuring temperatures and flow rates from heating, ventilation, and air conditioning (HVAC) systems to calibrate to a known standard, as well as reviewing operations to verify that controls are properly functioning.	The paper "Building commissioning: a golden opportunity for reducing energy costs and greenhouse gas emissions in the United States" by Evan Mills found that the application of commissioning "resulted in 16% median whole-building energy savings in existing buildings and 13% in new construction." GHG emissions reduction is calculated by applying the goal of 40 percent energy reduction to With Project 2040 emissions generated by 30 percent of industrial square footage (calculated based on full buildout of the General Plan 2040), resulting in **12 percent effectiveness** and a range of **12 to 16 percent** reduction in energy consumption and therefore emissions.	38,416 $MTCO_2e$
I-2	Promote and incentivize solar installations on new and existing industrial and warehousing facilities through partnerships with energy providers (e.g. Moreno Valley Utility (MVU), Southern California Edison (SCE)) and other private sector funding sources, with the goal of providing 25 percent of energy needs with solar in 30 percent of industrial and warehouse square footage by 2040. Examples of incentives	This measure is designed to reduce emissions from industrial building energy use through the installation of solar photovoltaic systems, which generate nearly zero emissions compared to traditional energy sources. This measure may be accomplished through financial and administrative incentives coupled with partnerships with energy providers and outreach to local businesses.	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of 0 to 100 percent reduction in GHG emissions through installation of onsite solar power renewable energy systems. Emissions reduction is calculated by applying the goal of 25 percent energy provision through solar to With Project 2040 emissions generated by 30 percent of industrial square footage (calculated based on full buildout of the General Plan 2040), resulting in 7.5 percent, rounded down to **7.0 percent effectiveness.**	22,409 $MTCO_2e$

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	**Measure**	**Description**	**Evidence of Effectiveness**	**Estimated GHG Emissions Reduction ($MTCO_2e$ per year)**
	include reduced permit fees or streamlined permit approval processes.			
I-3	Work with electricity providers (e.g. MVU, SCE) to encourage large commercial and industrial facilities to participate in energy efficient upgrade programs including installation of solar PV systems and EV chargers and to establish annual targets.	This measure is designed to reduce emissions from industrial building energy use through energy efficient upgrades. This may include onsite installation of solar PV systems and EV chargers, installation of energy efficient lighting and HVAC systems, and other methods of improving energy efficiency. This measure also requires the City and/or MVU to establish annual targets for industrial energy efficiency upgrades.	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of **0.2 – 5.5 percent** reduction in GHG emissions associated with non-residential electricity use and **0.7 – 10.0 percent** reduction associated with natural gas use. Given that this measure is voluntary and applies only to large commercial and industrial facilities, **0.5 percent effectiveness is used.**	1,601 $MTCO_2e$
I-4	Develop and implement Technology Advancement Program, working with industrial, warehousing, and distribution facilities to encourage innovation, development of new emissions reduction technologies, and energy efficient/alternative fueled equipment upgrades. Provide incentives through partnerships with regional, statewide, and federal programs.	This measure is designed to promote collaboration with industrial, warehousing, and distribution businesses in Moreno Valley to encourage innovation while reducing emissions from industrial building energy use. Multiple neighboring cities have found success in implementing such programs, and the City's Energy Efficiency and Climate Action Strategy includes similar strategies. This measure would provide financial incentives funded by partnerships with regional, statewide, and federal programs.	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of **0.4 – 20.3 percent** reduction in GHG emissions. Given that this measure is voluntary and applies only to large industrial facilities, but provides incentives and could result in economic benefits to companies involved, **1.0 percent effectiveness is used.**	3,201 $MTCO_2e$

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES

ID	Measure	Description	Evidence of Effectiveness	Estimated GHG Emissions Reduction ($MTCO_2e$ per year)
RESIDENTIAL STRATEGIES				**58,742 $MTCO_2e$**
R-1	Provide incentives such as streamlined permitting or bonus density for new multi-family buildings and re-roofing projects to install "cool" roofs consistent with the current California Green Building Code (CALGreen) standards for commercial and industrial buildings.	This measure is designed to reduce residential emissions through the installation of "cool" roofs. Cool roofs use reflective materials, often but not always light colored, to reflect more of the sun's energy than traditional dark roofs, and to more efficiently transmit heat from the building's interior. Compared to conventional dark roofs, the surface of a cool roof can be 50° to 60°F (28° to 33°C) cooler on a hot, sunny day. CALGreen has implemented standards for installation of cool roofs that apply only to new commercial and industrial buildings; this measure expands application of these standards to new multi-family buildings and re-roofing projects.	The Natural Resources Defense Council (NRDC) report "Looking Up: How Green Roofs and Cool Roofs Can Reduce Energy Use, Address Climate Change, and Protect Water Resources in Southern California" found that "studies vary widely but have shown that cool roofs generate savings of **10 to 43 percent** of a building's cooling energy demand, with one case study documenting that a residence in Sacramento achieved a savings of 69 percent." The report identifies an average cooling load reduction of 25 percent. Therefore, **25 percent effectiveness is used** and is applied to multi-family homes calculated based on full buildout of the General Plan 2040.	13,549 $MTCO_2e$
R-2	Require new construction and major remodels to install interior real-time energy smart meters in line with current utility provider (e.g. MVU, SCE) efforts.	This measure is designed to reduce residential emissions through installation of smart meters in new construction and major remodels, which encourages residents to understand their personal generation of GHG emissions. This measure will encourage residents to be more conscious of how they can reduce their own carbon footprint and integrate sustainable behaviors moving forward.	The American Council for an Energy-Efficient Economy report "Advanced Metering Initiatives and Residential Feedback Programs: A Meta-Review for Household Electricity-Saving Opportunities" references studies indicating average energy savings of 7 percent from installation of in-home energy monitors. Therefore, **7 percent effectiveness** is used and is applied to new multi-family homes calculated based on full buildout of the General Plan 2040.	5,280 $MTCO_2e$

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	**Measure**	**Description**	**Evidence of Effectiveness**	**Estimated GHG Emissions Reduction ($MTCO_2e$ per year)**
R-3	Develop and implement program to incentivize single-family residential efficiency retrofits and participation in Moreno Valley Utility direct install program with the goal of a 50 percent energy reduction compared to baseline in 30 percent of the total single-family homes citywide by 2040.	This measure is designed to reduce emissions from single-family residential building energy use through efficiency retrofits and participation in the Moreno Valley Utility Residential Energy Audit and Direct Install Program. The program provides eligible residential customers with a full in-home energy audit which includes specific energy efficiency recommendations for their home plus a fixed set of maintenance and upgrades provided at no cost up to the value cap set by energy use range or program participation. Measures included in this program are AC tune-ups, duct testing and sealing, HVAC filter change and energy efficient lighting.	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies this measure as a Best Management Practice. Emissions reduction is calculated by applying the goal of 50 percent energy reduction to With Project 2040 emissions generated by 30 percent of single-family homes (calculated based on full buildout of the General Plan 2040), resulting in **15 percent effectiveness.**	3,185 $MTCO_2e$
R-4	Prioritize cap and trade funds to assist low-income homeowners achieve energy-efficient improvements and fund weatherization programs.	This measure is designed to reduce emissions from residential building energy use while supporting low-income homeowners. Disadvantaged communities identified by CalEnviroScreen are specifically targeted for investment of proceeds from the State's cap-and-trade program. Energy-efficient improvement and weatherization programs are common recipients of cap-and-trade funds. Weatherization reduces energy costs for low-income households by increasing the energy efficiency of their homes, while ensuring their health and safety.	The Low-Income Weatherization Program (LIWP) is the state's first energy efficiency program that targets low-income Californians and has reduced energy bills in participating multifamily buildings by 30 percent and overall energy usage by an average of 40 percent. CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of **3.7 – 7.5 percent** reduction in GHG emissions. Given that this measure is dependent on funding and applies only to low-income homeowners, **3.7 percent effectiveness is used.**	9,793 $MTCO_2e$

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES

ID	Measure	Description	Evidence of Effectiveness	Estimated GHG Emissions Reduction ($MTCO_2e$ per year)
R-5	Apply for and prioritize Community Block Development Grant funds to assist low-income homeowners achieve energy-efficient improvements.	This measure is designed to ensure that new residential, commercial, and mixed-use developments incorporate commute trip reduction programs. A commute trip reduction program is a multi-strategy program that encompasses a combination of individual measures such as transit fare subsidies, ride-share programs, parking cash-out or priced parking, shuttles, and improved on-side amenities.	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of **3.7 – 7.5 percent** reduction in GHG emissions. Given that this measure is dependent on funding and applies only to low-income homeowners, **3.7 percent effectiveness is used.**	9,793 $MTCO_2e$
R-6	Develop program and funding strategy to incentivize conversion of natural gas heated homes and nonresidential buildings to electricity.	This measure is designed to reduce emissions from residential and nonresidential building natural gas use by incentivizing conversion to electricity, which would generate a lower level of GHG emissions. This measure is dependent on funding and execution of the program to provide financial incentives for building owners to make the conversion.	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of **2.0 – 4.0 percent** reduction in GHG emissions. Given that this measure would provide financial incentives but would be voluntary, **2.0 percent effectiveness is used** and applied to total housing units and non-residential square footage calculated based on full buildout of the General Plan 2040.	4,185 $MTCO_2e$
R-7	Develop and implement program to incentivize multi-family residential efficiency audits and participation in Moreno Valley Utility direct install program with the goal of a 50 percent energy reduction in 30 percent of the projected amount of multi-family homes citywide by 2035	This measure is designed to reduce emissions from multi-family residential building energy use through participation in the Moreno Valley Utility Residential Energy Audit and Direct Install Program. The program provides eligible residential customers with a full in-home energy audit which includes specific energy efficiency recommendations for their home plus a fixed set of maintenance and upgrades provided at no cost up to the value cap set by energy use range or program participation. Measures included in this program are AC tune-ups, duct testing	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies this measure as a Best Management Practice. Emissions reduction is calculated by applying the goal of 50 percent energy reduction to With Project 2040 emissions generated by 30 percent of multi-family homes (calculated based on full buildout of the General Plan 2040), resulting in **15 percent effectiveness.**	12,955 $MTCO_2e$

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	**Measure**	**Description**	**Evidence of Effectiveness**	**Estimated GHG Emissions Reduction ($MTCO_2e$ per year)**
		and sealing, HVAC filter change and energy efficient lighting.		
R-8	Provide a toolkit of resources, including web-based efficiency calculators, for residents and businesses to analyze their greenhouse gas emissions in comparison to their neighborhood, the city, and the region.	This measure is designed to reduce residential emissions by encouraging residents to understand their personal generation of GHG emissions. While not all residents or businesses will utilize this toolkit, this measure will encourage citizens and businesses to be more conscious of how they can reduce their own carbon footprint and integrate sustainable behaviors moving forward. The carbon footprint calculators provided in Appendix A may be used in the toolkit.	This measure is supportive, and the emissions reduction potential cannot be precisely quantified. Implementation of this measure is likely to result in an unknown reduction in GHG emissions and residential and commercial energy consumption.	0 $MTCO_2e$
R-9	Develop and implement a competitive greenhouse gas reduction program with an award component between groups of citizens in the city.	This measure is designed to reduce residential emissions by encouraging residents to maximize opportunities to reduce personal GHG emissions through a competition. While not all residents will participate, this measure will encourage citizens to be more conscious of how they can reduce their own carbon footprint and integrate sustainable behaviors moving forward. The carbon footprint calculators provided in Appendix A may be used to track progress in the competition.	This measure is supportive, and the emissions reduction potential cannot be precisely quantified. Implementation of this measure is likely to result in an unknown reduction in GHG emissions and residential energy consumption.	0 $MTCO_2e$

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES

ID	Measure	Description	Evidence of Effectiveness	Estimated GHG Emissions Reduction ($MTCO_2e$ per year)
COMMERCIAL STRATEGIES				
C-1	Expand efforts to install energy-efficient lighting technologies in new and existing private parking lots.	This measure is designed to reduce emissions generated by lighting in private parking lots by partnering with businesses to install energy-efficient lighting technologies.	Moreno Valley Utility is currently working on a LED Streetlight Retrofit Project, and has found that conversion to energy-efficient lighting technology may reduce energy consumption by up to 68 percent. CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of 16 to 40 percent. Given that similar efforts are currently underway but this measure will require collaboration with private parking lot owners, **20 percent effectiveness is used.**	21,999 $MTCO_2e$
C-2	Facilitate energy efficiency improvements in nonresidential buildings through incentives and regulations that may include energy performance reports, time of sale upgrades, and/or innovative partnerships such as expansion of utility provider (e.g. MVU, SCE, SoCal Gas) programs to reduce energy use.	This measure is designed to reduce commercial emissions by facilitating energy efficiency improvements through incentives and regulations. This measure provides a range of options to engage nonresidential building owners in energy efficiency improvements, including financial incentives.	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of **5.2 – 15.0 percent** reduction in GHG emissions. Given that this measure provides financial incentives but is optional, **5.2 percent effectiveness is used.**	8,307 $MTCO_2e$
C-3	Promote energy efficiency financing programs to medium to large sized commercial facilities.	This measure is designed to reduce emissions from commercial building energy usage and is specifically targeted at medium to large businesses. This measure promotes and connects businesses with energy efficiency financing programs through Moreno Valley Utility,	The Environmental Protection Agency (EPA) paper "Energy Efficiency as a Low-Cost Resource for Achieving Carbon Emissions Reductions" indicates that energy efficiency improvements in nonresidential buildings result in an average energy savings and therefore effectiveness of **0.4 percent**. This is	479 $MTCO_2e$

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	**Measure**	**Description**	**Evidence of Effectiveness**	**Estimated GHG Emissions Reduction ($MTCO_2e$ per year)**
		Southern California Edison, SoCal Gas, and local agencies.	applied to 75 percent of nonresidential square feet calculated based on full buildout of the General Plan 2040 to represent medium to large sized business square footage.	
C-4	Promote Moreno Valley Utility and Southern California Edison direct install energy efficiency programs to help small businesses identify opportunities to save electricity.	This measure is designed to reduce emissions from commercial building energy usage and is specifically targeted at small businesses. The measure promotes the Moreno Valley Utility Residential Energy Audit and Direct Install Program and Southern California Direct Install Program. Both programs offers long-term energy savings to qualifying businesses by providing no- or low-cost energy-efficient products, including installation.	The Environmental Protection Agency (EPA) paper "Energy Efficiency as a Low-Cost Resource for Achieving Carbon Emissions Reductions" indicates that energy efficiency improvements in nonresidential buildings result in an average energy savings and therefore effectiveness of **0.4 percent**. This is applied to 25 percent of nonresidential square feet calculated based on full buildout of the General Plan 2040 to represent small business square footage.	158 $MTCO_2e$
C-5	Actively engage with Moreno Valley businesses to identify areas for GHG reduction and financial savings.	This measure is designed to reduce commercial emissions by encouraging businesses to maximize opportunities to reduce GHG emissions through and save money. While not all businesses will participate, this measure will encourage businesses to be more conscious of how they can reduce their own carbon footprint and integrate sustainable practices moving forward. By marketing these efforts and highlighting opportunities for financial savings, businesses may be encouraged to participate. The carbon footprint calculators provided in Appendix A may be used to track progress in the competition.	This measure is supportive, and the emissions reduction potential cannot be precisely quantified. Implementation of this measure is likely to result in an unknown reduction in GHG emissions and commercial energy consumption.	0 $MTCO_2e$

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	**Measure**	**Description**	**Evidence of Effectiveness**	**Estimated GHG Emissions Reduction ($MTCO_2e$ per year)**
OFF-ROAD EQUIPMENT STRATEGIES				**6,160 $MTCO_2e$**
OR-1	Encourage residents and businesses to use efficient lawn and garden maintenance equipment or to reduce the need for landscape maintenance through native planting. o Partner with the SCAQMD to establish a voluntary exchange program for residential electric lawnmowers and backpack-style leaf blowers. o Require new buildings to provide electrical outlets in an accessible location to facilitate use of electric-powered lawn and garden equipment. o In project review, encourage the replacement of high-maintenance landscapes (like grass turf) with native vegetation to reduce the need for gas-powered lawn and garden equipment.	This measure is designed to reduce emissions generated by gas-powered and inefficient lawn and garden maintenance equipment. This measure is voluntary for most residents but provides multiple opportunities to replace off-road equipment with alternatives that generate reduced emissions. By requiring new development to provide electrical outlets, this measure further encourages use of efficient equipment. Finally, this measure encourages planting of native vegetation to remove the need for lawn and garden maintenance equipment, as well as reducing emissions generated through consumption of water.	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of **0 to 49.5 percent.** Given that this measure is largely voluntary and relies on project review, **1.0 percent effectiveness is used.**	4,928 $MTCO_2e$

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	**Measure**	**Description**	**Evidence of Effectiveness**	**Estimated GHG Emissions Reduction ($MTCO_2e$ per year)**
OR-2	Reduce emissions from heavy-duty construction equipment by limiting idling based on South Coast Air Quality Management District (SCAQMD) requirements and utilizing cleaner fuels, equipment, and vehicles. o Require provision of clear signage reminding construction workers to limit idling o Require project applicants to limit GHG emissions through one or more of the following measures: substitute electrified or hybrid equipment for diesel/gas powered, use alternative-fueled equipment on site, avoid use of on-site generators.	This measure is designed to reduce emissions generated by heavy-duty construction equipment. Development of the General Plan 2040 will result in increased construction in Moreno Valley, and therefore would necessitate the use of heavy-duty construction equipment. This measure would establish requirements to limit idling, reducing localized emissions, and would require project applicants to utilize more efficient and climate-friendly equipment during construction.	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of **2.5 to 22 percent** reduction in GHG emissions. Given that this measure establishes requirements for project applicants but does not establish new standards or require a comprehensive switch to alternative fueled equipment, **2.5 percent effectiveness** is used.	1,232 $MTCO_2e$

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	**Measure**	**Description**	**Evidence of Effectiveness**	**Estimated GHG Emissions Reduction ($MTCO_2e$ per year)**
PUBLIC SERVICES AND PUBLIC LIGHTING STRATEGIES				**187 $MTCO_2e$**
PS-1	Participate in Savings by Design program to identify ways to improve the energy efficiency for all new municipal buildings and facilities. As part of the Savings By Design program, new municipal buildings and facilities shall have a goal to exceed Title 24 Building Standards by 10%.	This measure is designed to reduce emissions generated by municipal buildings and facilities. Savings by Design is a program to encourage high-performance nonresidential building design and construction within the service territories of PG&E, SDG&E, Southern California Edison, or Southern California Gas. The program offers building owners and their design team a wide range of services including design assistance, owner incentives, and design team incentives. Financial incentives are available when the efficiency of the building exceeds Title 24 Building Standards by 10 percent.	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of **2.5 – 5.5 percent** reduction in GHG emissions for nonresidential buildings that exceed Title 24 by 10 percent. Given that this measure establishes a goal of 10 percent beyond Title 24 Building Standards and similar policies are included in the City's Energy Efficiency and Climate Action Strategy, **5.5 percent effectiveness is used.**	66 $MTCO_2e$
PS-2	Expand City of Moreno Valley's Environmental Procurement Administrative Procedure to address energy efficient equipment.	This measure is designed to reduce emissions generated by municipal equipment through the City's procurement policy. Moreno Valley's current Environmental Procurement Administrative Procedure currently focuses on the procurement of services and products that "reduce toxicity; conserve natural resources, materials, and energy; and maximize recyclability and recycled content" but does not specifically promote energy efficiency equipment.	The EPA report "Energy-Efficient Product Procurement: A Guide to Developing and Implementing Greenhouse Gas Reduction Programs" finds that "purchasing energy-efficient products, which operate as effectively as conventional ones, can reduce government facility energy costs by about **5 – 10 percent**." Given that Moreno Valley has already adopted an Environmental Procurement Administrative Procedure and similar policies are included in the City's Energy Efficiency and Climate Action Strategy, **10.0 percent effectiveness** is used.	121 $MTCO_2e$

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	**Measure**	**Description**	**Evidence of Effectiveness**	**Estimated GHG Emissions Reduction ($MTCO_2e$ per year)**
PS-3	Support Moreno Valley Utility and Southern California's efforts to conduct an annual municipal energy audit to determine if energy efficient retrofits are effective in reducing emissions from City operations.	This measure is designed to reduce and monitor emissions from municipal building energy usage through an annual energy audit. This measure supports measures PS-1 and PS-2.	This measure is supportive, and the emissions reduction potential cannot be precisely quantified. Implementation of this measure is likely to result in an unknown reduction in GHG emissions and municipal energy consumption.	0 $MTCO_2e$
PS-4	Utilize Energy Management tools to monitor long-term impacts of municipal efficiency projects.	This measure is designed to reduce and monitor emissions from municipal building energy usage through the use of Energy Management tools. This measure supports measures PS-1 and PS-2.	This measure is supportive, and the emissions reduction potential cannot be precisely quantified. Implementation of this measure is likely to result in an unknown reduction in GHG emissions and municipal energy consumption.	0 $MTCO_2e$
NATURAL RESOURCES STRATEGIES				**0 $MTCO_2e$**
NC-1	Require new landscaping to be climate appropriate.	This measure is designed to reduce emissions generated by the management and distribution of water consumed in landscaping maintenance. Climate appropriate landscaping would require less water and therefore generate reduced emissions.	This measure is supportive, and the emissions reduction potential cannot be precisely quantified. Implementation of this measure is likely to result in an unknown reduction in GHG emissions and water consumption.	0 $MTCO_2e$
NC-2	Encourage residents and businesses to use efficient lawn and garden maintenance equipment or to reduce the need for landscape maintenance through native planting.	This measure is designed to reduce emissions generated by the management and distribution of water consumed in landscaping maintenance and emissions generated by landscaping equipment (see OR-1). Native planting would require less water and energy consumption and therefore generate reduced emissions.	This measure is supportive, and the emissions reduction potential cannot be precisely quantified. Implementation of this measure is likely to result in an unknown reduction in GHG emissions and water consumption.	0 $MTCO_2e$

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	**Measure**	**Description**	**Evidence of Effectiveness**	**Estimated GHG Emissions Reduction ($MTCO_2e$ per year)**
NC-3	Increase and maintain urban greening in the community by maintaining Tree City USA status and promoting tree planting and urban gardening programs.	This measure is designed to reduce emissions through carbon sequestration. Additionally, tree planting programs would provide shade, thereby limiting the effects of urban heat islands.	This measure is supportive, and the emissions reduction potential cannot be precisely quantified. Implementation of this measure is likely to result in an unknown reduction in GHG emissions and water consumption, and would limit the effects of heat islands	0 $MTCO_2e$
TOTAL EMISSIONS REDUCTION FROM CLIMATE ACTION PLAN STRATEGIES				**411,743 $MTCO_2e$**

Sources:

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Appendix C

Potential Project Level GHG Reduction Measures

In addition to the potential programmatic measures contained in this Climate Action Plan, the following is a non-exclusive list of potential additional measures that can be applied at the project level to reduce greenhouse gas emissions. It should be noted that these measures are not essential for the City to meet its GHG reduction targets, but are presented here for informational purposes. Sources for additional potential measures include those listed in CAPCOA's "CEQA and Climate Change, Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act (January 2008)" and OPR's "CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA)."

Renewable Energy

- Provide onsite renewable energy system(s). Nonpolluting and renewable energy potential includes solar, wind, geothermal, low-impact hydro, biomass and bio-gas strategies
- Include in new buildings facilities to support the use of low/zero carbon fueled vehicles, such as the charging of electric vehicles from green electricity sources

Green Building

- Meet recognized green building and energy efficiency benchmarks such as LEED and ENERGY STAR
- Incorporate materials which are resource efficient, recycled, with long life cycles and manufactured in an environmentally friendly way

Energy Efficiency

- Exceed Diamond Bar Green Building Code (Title 24) mandatory efficiency requirements by 15% or more
- Install light colored "cool" roofs (e.g. Energy Star roofing) or other highly reflective, highly emissive roofing materials
- Install a vegetated ("green") roof that covers at least 50% of roof area
- Design project to maximize solar orientation (i.e., 75% or more building face north or south; include roof overhangs that block high summer sun, but not lower winter sun, from penetrating south-facing windows
- Plant trees and vegetation near structures to shade buildings and reduce energy requirements for heating/cooling
- Install energy-reducing ceiling/whole-house fans
- Install energy efficient lighting (e.g., light emitting diodes (LEDs)), heating and cooling systems, appliances, equipment, and control systems. (e.g., Energy Star)
- Install energy-reducing programmable thermostats that automatically adjust temperature settings

Transportation

- Develop commute trip reduction plans that encourage employees who commute alone to consider alternative transportation modes
- Create an online ridesharing program that matches potential carpoolers immediately through email
- Provide fair-share funding of transportation improvements
- Provide shuttle service or public transit incentives such as transit passes to decrease work-related auto trips
- Provide "end-of-trip" facilities including showers, lockers, and changing space (nonresidential projects)
- Incorporate public transit into project design
- Incorporate bicycle lanes, routes and facilities into street systems, new subdivisions, and large developments
- Provide amenities for non-motorized transportation, such as secure and convenient bicycle parking
- Provide plentiful short- and long-term bicycle parking facilities (nonresidential projects)
- Provide long-term bicycle parking is provided at apartment complexes or condominiums without garages

- Create pedestrian (and/or bicycle) access network that internally links all uses and connects to all existing/planned external streets and pedestrian (and/or bicycle) facilities contiguous with the project site
- Provide a parking lot design that includes clearly marked and shaded pedestrian pathways between transit facilities and building entrances
- Provide parking for EVs/CNG vehicles
- Install EV charging facilities

Water Conservation

- Install water-efficient fixtures and appliances such as low-flow fixtures, dual flush toilets, and other water efficient appliances
- Install water-efficient irrigation systems and devices, such as soil moisture-based irrigation controls and use water-efficient irrigation methods
- Implement low-impact development practices that maintain the existing hydrology of the site to manage storm water and protect the environment
- Incorporate recycled/reclaimed water for landscape irrigation and other non-potable water use needs
- Incorporate rain barrels and gray water systems for landscape irrigation

Landscaping

- Incorporate into landscapes drought resistant native trees, trees with low emissions and high carbon sequestration potential
- Provide parking lot areas with 50% tree cover within 10 years of construction, in particular low emitting, low maintenance, native drought resistant trees. Reduces urban heat island effect
- Dedicate space for neighborhood gardening
- Establish an urban tree planting program

Solid Waste Measures

- Reuse and recycle construction and demolition waste (including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard)
- Provide interior and exterior storage areas for recyclables and green waste and adequate recycling containers located in public areas
- Provide education and publicity about reducing waste and available recycling services

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WHERE DREAMS SOAR

DYETT & BHATIA
Urban and Regional Planners