Ontario Community Climate Action Plan

Adopted
August 16, 2022

CITY OF ONTARIO
SOUTHERN CALIFORNIA

PLACEWORKS

CITY OF ONTARIO SOUTHERN CALIFORNIA

Ontario Community Climate Action Plan

Adopted August 16, 2022

PLACEWORKS

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LIST OF ABBREVIATIONS

AB	Assembly Bill
ACS	American Community Survey
ADC	alternative daily cover
AQMP	air quality management plan
BRT	bus rapid transit
CARB	California Air Resources Board
CCAP	community climate action plan
CEQA	California Environmental Quality Act
CH_4	methane
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CALGreen	California Green Building Standards Code
DOE	Department of Energy (U.S.)
EIR	Environmental Impact Report
EO	Executive Order
EPA	Environmental Protection Agency (U.S.)
EV	electric vehicle
FMMP	Farmland Mapping and Monitoring Program
GHG	greenhouse gas
Global Protocol	Global Protocol for Community-Scale Greenhouse Gas Inventories
GWP	global warming potential
HCD	Housing and Community Development Department (California)
HFC	hydrofluorocarbon
IEUA	Inland Empire Utilities Agency
IPCC	Intergovernmental Panel on Climate Change
IT	information technology
kWh	kilowatt-hour
LED	light-emitting diode
LEED	Leadership in Energy and Environmental Design
LCFS	low-carbon fuel standard
MMT	million metric tons
MT	metric ton
$MTCO_2e$	metric tons of carbon dioxide equivalent
MSW	Municipal solid waste
N_2O	nitrous oxide
NF_3	nitrogen trifluoride

LIST OF ABBREVIATIONS (CONTINUED)

OMUC	Ontario Municipal Utilities Company
PFC	perfluorocarbon
PV	photovoltaic
RPS	Renewable Portfolio Standard
RTTAC	Regional Transit Technical Advisory Committee
SB	Senate Bill
SBCOG	San Bernardino Council of Governments
SBCTA	San Bernardino County Transportation Authority
SCAQMD	South Coast Air Quality Management District
SCAG	Southern California Association of Governments
SF_6	sulfur hexafluoride
SoCalREN	Southern California Regional Energy Network
TOP	The Ontario Plan
TOD	transit-oriented development
U.S. Community Protocol	United States Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions
VMT	vehicle miles traveled
ZEV	zero-emission vehicle

EXECUTIVE SUMMARY

The 2022 Community Climate Action Plan (CCAP) is Ontario's strategic plan to reduce greenhouse gas (GHG) emissions and foster a sustainable community through 2050 and beyond. The Ontario Plan (TOP), the City's comprehensive plan or general plan, directs the preparation, ongoing implementation, and update of the CCAP, providing the framework for Ontario to reduce its community-wide GHG emissions in a manner consistent with the adopted state reduction target for 2030 and the longer-term goals for 2045 and 2050. The CCAP allows the City of Ontario decision-makers, staff, and community to understand the sources and magnitude of local GHG emissions, reduce GHG emissions, and prioritize steps to achieve GHG emission-reduction targets.

The CCAP is consistent with the California Environmental Quality Act (CEQA) Guidelines for Plans for the Reduction of Greenhouse Gas Emissions (California Code of Regulations Section 15183.5). This allows the 2022 CCAP to support and streamline environmental review of GHG emissions for future development projects in the city. The 2022 CCAP serves as the programmatic tiering document for review of the climate change impacts of projects under CEQA and is included in the Supplemental Environmental Impact Report for TOP 2050.

The 2022 CCAP is an update of the 2014 Community Climate Action Plan (2014 CCAP), providing updated analyses and background information, an expanded set of GHG reduction strategies, and a planning horizon out to 2050. The CCAP contains an inventory of the community's GHG emissions from the transportation, energy, waste, off-road equipment, agriculture, water, and wastewater sectors; land use sequestration; stationary sources; and goals, strategies, and actions to address climate change adaptation and GHG emissions. The CCAP also presents a work plan for the City to implement strategies and track progress over time.

The City of Ontario prepared the 2022 CCAP to update the community's strategic path to reducing GHG emissions beyond 2020, consistent with State requirements and TOP 2050. Specifically, the CCAP does the following:

- Provides an introduction and context for the CCAP in Chapters 1 and 2, including community history and demographics, an overview of the City's existing actions to address climate change, a discussion of climate change and equity, and the relationship between the CCAP and state and regional planning efforts in.
- Identifies and updates sources of GHG emissions within the City of Ontario's municipal boundaries for the calendar year of 2019 and estimates how these emissions may change over time (Chapter 3).

- Presents the GHG emission reduction targets established by state regulations and guidance and the City's GHG reduction targets (Chapter 4). Chapter 4 shows where the City currently stands in its efforts to reduce GHG emissions and the GHG reductions required by the 2022 CCAP to meet its targets.
- Provides strategies (see Chapter 5) in various sectors to meet or exceed the state targets of reducing emissions 40 percent below 1990 levels by 2030 and 80 percent below 1990 levels by 2050, consistent with the direction of the State of California via Assembly Bill (AB) 32, Governor's Executive Order S-03-05, and California Public Resources Code Section 21083.3. Chapter 5, GHG Emission Reduction Strategy, has two sections:
  - The Existing GHG Reduction Strategies section outlines the existing and planned local and state initiatives that are expected to reduce Ontario's future GHG emissions and move the community closer to achieving its targets.
  - The New GHG Reduction Strategies section outlines the new 2022 strategies that show a viable path for Ontario to reach its established GHG emission reduction targets. This includes goals, strategies, and actions; their impacts on GHG emissions; and the co-benefits they provide to enhance ecological, economic, and social well-being. These strategies include actions that will be led by City staff and actions or project features for inclusion in certain development projects as identified by the strategy.
- Provides substantial evidence that the emission reductions estimated in the CCAP are feasible in Chapter 5, with supporting technical detail in Appendix A.
- Provides an implementation program (see Chapter 6) and discusses the various outcomes of reduction efforts and how these reduction efforts can be implemented.

The CCAP is summarized in Section 5.8, Greenhouse Gas Emissions, of the Supplemental Environmental Impact Report for The Ontario Plan 2050. The measures in this 2022 CCAP are not substantially different than those of the 2014 CCAP, and therefore there is no change in the environmental impacts associated with the CCAP.

The CCAP allows community members, City staff and officials, and other stakeholders to understand Ontario' existing efforts and strategies to achieve its GHG reduction goals. It builds on the 2014 CCAP and is consistent with the regional San Bernadino County GHG Reduction Plan.

Greenhouse Gas Inventory and Forecast

A GHG inventory is a summary of the GHG emissions generated by activities that take place within a community. The GHG emissions inventories and the GHG forecast lay the groundwork for the CCAP, which seeks to align the City's GHG reduction efforts with state-recommended targets. The community-wide GHG inventories, which include both community-wide sectors and municipal operations, assess GHG emissions for the years 2008, 2016, and 2019. The 2022 CCAP update is informed by the latest science in GHG accounting, best practices, and emissions factors.

The community-wide GHG inventory assessed GHG emissions from nine categories of activities, known as sectors.

- **Transportation.** GHG emissions created by driving on-road vehicles in Ontario, including passenger and freight vehicles.
- **Residential energy.** GHG emissions attributed to the use of electricity and natural gas in residential buildings.
- **Nonresidential energy**. GHG emissions attributed to the use of electricity and natural gas in nonresidential buildings.
- **Solid waste.** GHG emissions released from trash collected from residents and businesses.
- **Off-road equipment**. GHG emissions from equipment that does not provide on-road transportation (excluding agricultural equipment), such as tractors for construction or equipment used for landscape maintenance.
- **Agriculture.** GHG emissions from various agricultural activities, including agricultural equipment, crop cultivation and harvesting, and livestock operations.
- **Water and wastewater.** This sector accounts for the electricity used to transport every gallon of water to or wastewater from city residents and businesses, as well as direct emissions from processing wastewater.
- **Land use and sequestration**. Emissions released into the atmosphere from development of previously undeveloped land and GHG emissions absorbed and stored in trees and soils on locally controlled lands as part of healthy ecosystems.
- **Stationary sources**. Emissions from fuel use at major industrial facilities permitted by state and regional air quality authorities. Stationary source emissions are informational and are not included in the community total.

Throughout the CCAP, emissions are provided in terms of per capita GHG emissions. Per capita emissions show the average number of emissions per service population, which is the sum of community residents and employees in Ontario. Per capita GHG emissions show changes in emissions over time and are helpful for showing consistency with state-recommended GHG reduction targets. The City's per-capita emissions targets are 6.0 metric tons of carbon dioxide equivalent ($MTCO_2e$) per capita by 2030 and 2.0 $MTCO_2e$ per capita below 1990 levels by 2050.

As shown in **Table ES-1**, per capita GHG emissions have declined steadily from 2008 levels. Per capita emissions in Ontario decreased from approximately 8.25 $MTCO_2e$ in 2008 to approximately 5.55 $MTCO_2e$ per person in 2019, a decrease of 33 percent. Transportation was highest-emitting sector, responsible for approximately 55 percent of the city's total GHG emissions in 2019, followed by the nonresidential and residential energy sectors as the second- and third-largest sources of GHG emissions. The four sectors that experienced the largest decreases in annual GHG emissions between 2008 and 2019 are land use and sequestration, agriculture, water and wastewater, and nonresidential energy, which reduced emissions by 77 percent, 75 percent, 56 percent, and 54 percent, respectively.

Table ES-1 Ontario Community-Wide Per Capita GHG Emissions by Sector, 2008 to 2019 ($MTCO_2e$)

Sector	2008	2016	2019	Percentage Change, 2008–2019
Transportation	3.51	3.00	3.04	-13%
Nonresidential energy	2.77	1.80	1.29	-54%
Residential energy	0.72	0.55	0.50	-30%
Solid waste	0.28	0.22	0.27	-4%
Off-road equipment	0.17	0.08	0.21	23%
Agriculture	0.63	0.21	0.16	-75%
Water and wastewater	0.15	0.08	0.06	-56%
Land use and sequestration	0.01	0.00	0.00	-77%
Total annual per capita $MTCO_2e$	**8.25**	**5.95**	**5.54**	**-33%**
Informational Items				
Stationary sources	1.50	0.25	1.05	-30%

The community-wide forecast is a projection of future GHG emissions based on the results of the 2019 inventory and estimates of future community population and job growth. The CCAP includes a GHG forecast for the calendar years 2030 and 2050, relying on population, housing, and employment projections based on the estimates of future buildout in TOP 2050. As shown in Table ES-2, the city's forecast per-capita emissions are expected to decrease by approximately 45 percent between 2008 and 2050.

Table ES-2 Ontario Community-wide GHG Emissions Forecast, 2008 to 2050 ($MTCO_2e$)

Sector	2008[1]	2016[1]	2019[1]	2030	2050	Percentage Change, 2008–2050
Transportation	3.51	3.00	3.04	2.84	2.15	-39%
Nonresidential energy	2.77	1.80	1.29	1.30	1.29	-54%
Residential energy	0.72	0.55	0.50	0.53	0.57	-21%
Solid waste	0.28	0.22	0.27	0.27	0.27	-4%
Off-road equipment	0.17	0.08	0.21	0.21	0.21	23%
Agriculture[2]	0.63	0.21	0.16	0.08	0.00	-100%
Water and wastewater	0.15	0.08	0.06	0.06	0.06	-56%
Land use and sequestration	0.01	Less than 0.01	Less than 0.01	Less than 0.01	Less than 0.01	-81%
Total	**8.25**	**5.95**	**5.54**	**5.30**	**4.56**	**-45%**

1. Data shown for 2008, 2016, 2019 are the actual per capita GHG emissions. The data shown for 2030, 2040, and 2050 are GHG per capita emission forecasts, calculated based on projections from the 2019 inventory.
2. GHG emission projects for the agriculture are based on the assumption that, by 2050, all agricultural land will be developed and converted to other land uses, so agricultural emissions will decrease to zero by 2050.

Greenhouse Gas Reduction Strategies

To evaluate the City's current progress toward meeting its emissions reductions targets, this CCAP acknowledges existing climate action policies and programs, planned future actions, and actions soon-to-be implemented at the state and local level.

The CCAP quantifies GHG emissions reductions associated with the implementation of these actions. As shown in Table ES-3, with the implementation of existing and planned state and local actions, the community's GHG emissions are projected to be 3.54 $MTCO_2e$ per capita and 1.31 $MTCO_2e$ per capita in 2030 and 2050, respectively.

Table ES-3 Ontario Community-Wide Emission Reductions from Existing State, Regional, and Local Actions, 2030–2050

Changes in Per Capita Emissions	2030 $MTCO_2e$	2050 $MTCO_2e$
Forecast per-capita emissions without state actions	5.30	4.56
Emission reductions from existing and planned state actions	-1.09	-2.15
Emission reductions from planned local actions without CCAP	-0.15	Less than -0.01
Community-wide emissions with existing and planned state and local actions	**4.06**	**2.40**

Though implementation of existing state and local actions will help the City meets its GHG reduction targets, these actions are insufficient on their own. Thus, the CCAP identifies future strategies that, if implemented at the levels specified in the technical appendix, will allow the community to achieve its emissions-reductions targets. Refer to **Table ES-4** for a list of the CCAP strategies, explained in more detail in Chapter 5.

Table ES-4 List of 2022 CCAP GHG Reduction Strategies

Strategy Number	Strategy Name	Strategy Language	Per Capita Emission Reductions	
			2030 $MTCO_2e$	2050 $MTCO_2e$
1	Building electrification	Promote and incentivize the phase-out of gas appliances in new and existing homes and businesses throughout the community to advance GHG reductions, increase energy efficiency, and protect public safety and environmental health.	0.0257	0.1453
2	Onsite solar energy for existing residential development.	Continue to support and facilitate installation of rooftop solar photovoltaic and onsite solar energy systems in existing residential development.	0.0051	0.0000

Strategy Number	Strategy Name	Strategy Language	Per Capita Emission Reductions	
			2030 $MTCO_2e$	2050 $MTCO_2e$
3	Onsite solar energy systems for nonresidential development.	Ensure new large nonresidential development, including City facilities, includes onsite renewable energy to support the site's energy needs by requiring solar photovoltaic panels or other appropriate onsite renewable energy generation systems for the following types of projects: • New commercial and office buildings, or existing commercial and office building expansions greater or equal to 45,000 square feet in size. • New industrial or existing industrial buildings expansions greater or equal to 100,000 square feet in size.	0.0659	0.0000
4	Green roofs	Promote and incentivize residents and business owners to install green roofs to conserve energy and reduce surface water runoff.	0.0000	0.0000
5	Urban cooling	Maintain and expand the city's existing tree canopy, with a goal of planting 500 trees annually through 2050 and promote the use of pervious concrete and cool pavement for pavement projects.	0.0140	0.0180
6	Energy efficiency retrofits for low-income households	Promote and incentivize voluntary energy efficiency retrofits of homes to reduce natural gas and electricity usage, with the goal of retrofitting 9,000 low-income homes by 2050. Partner with community services agencies to fund energy efficiency projects, including heating, ventilation, air conditioning, indoor lighting, water heating equipment, insulation, and weatherization for low-income residents.	0.0023	0.0020

Strategy Number	Strategy Name	Strategy Language	Per Capita Emission Reductions	
			2030 $MTCO_2e$	2050 $MTCO_2e$
7	Energy efficiency retrofits	Promote and incentivize voluntary energy efficiency retrofits to reduce in natural gas and electricity usage. Partner with regional agencies to expand access to existing energy efficiency and conservation opportunities, incentives, and technical assistance for residents and businesses.	0.0288	0.0221
8	Smart Growth and Infill	Encourage revitalization of neighborhoods through higher-density, mixed-use, infill development and creative reuse of under-utilized sites within the urban core.	0.0000	0.0000
9	Transit-Oriented Development	Encourage development of compact, mixed-use, and transit-oriented development to improve the regional jobs-housing balance, especially on corridors served by high-ridership transit and bus rapid transit (BRT), such as Holt Avenue.	0.0008	0.0020
10	Increase Transportation Ridership	Ensure a reliable and responsive transit system with dedicated and secure funding and resources to support increased ridership.	0.0697	0.0445
11	Traffic signal synchronization and roadway management	Implement traffic and roadway management strategies to improve mobility and efficiency and reduce associated emissions.	0.0000	0.0000
12	Community vehicle electrification	Promote and incentivize the adoption of electric vehicles (EV) citywide, including light-duty and heavy-duty vehicles, for municipal, commercial, and residential uses.	0.1565	0.6584
13	Active transportation networks	Work with transit agencies, school districts, and employers to facilitate an interconnected transportation system that allows a shift in travel from private passenger vehicles to alternative modes, including public transit, ride sharing, car sharing, bicycling, and walking.	0.0045	0.0054

Strategy Number	Strategy Name	Strategy Language	Per Capita Emission Reductions	
			2030 $MTCO_2e$	2050 $MTCO_2e$
14	Vehicle idling	Limit idling of heavy-duty trucks. Support the South Coast Air Quality Management District (SCAMQD) and ARB anti-idling requirements and provide signage in key areas where idling that is not consistent with SCAMQD or ARB requirements might occur.	0.0049	0.0025
15	Parking policy and event parking	Adopt a comprehensive parking policy that encourages carpooling and the use of alternative transportation, including providing parking spaces for car-share vehicles at convenient locations with access to public transportation.	0.0056	0.0115
16	Electrification of construction and landscaping equipment	Promote and incentivize the transition to electric construction and landscaping equipment.	0.0120	0.0368
17	Idling ordinance for construction equipment	Limit idling of heavy-duty off-road construction equipment to reduce air pollution and GHG emissions from construction activity.	0.0001	0.0001
18	Methane capture at landfills	Support efforts to reduce methane emissions from regional landfills.	0.0558	0.0812
19	Waste diversion	Exceed waste diversion goals recommended by AB 939 and CALGreen by adopting a citywide diversion target of at least 75 percent of waste.	0.0361	0.0547
20	Construction and Demolition Waste Recovery Ordinance	Increase the amount of waste recycled during construction and demolition of buildings.	0.0000	0.0000
21	Indoor water efficiency	Encourage water-efficient retrofits of new and existing buildings by working with water providers and regional agencies.	0.0114	0.0036

Strategy Number	Strategy Name	Strategy Language	Per Capita Emission Reductions	
			2030 $MTCO_2e$	2050 $MTCO_2e$
22	Water efficient landscapes and water recycling	Promote drought-tolerant and fire-wise landscaping. Encourage increased use of reclaimed water for landscape irrigation, agricultural, and industrial use.	0.0085	0.0000
23	Water system and wastewater operations efficiency	Maximize efficiency at drinking water treatment, pumping, and distribution facilities, including development of off-peak demand schedules for heavy commercial and industrial users.	0.0004	0.0000
24	Methane capture for wastewater treatment	Work with Inland Empire Utilities Agency (IEUA), the local wastewater treatment provider, to increase methane capture rate.	0.0024	0.0032
25	Methane capture for dairy operations	Encourage and incentivize local dairy operations to reduce methane emissions through methane capture technology.	0.0079	0.0000
26	Climate change awareness and education	Promote climate change awareness and GHG reduction community-wide through a variety of mechanisms, including through support of climate change education in schools or community colleges.	0.0000	0.0000
27	Carbon sequestration	Establish a citywide carbon sequestration project and sequestration goal of 5,000 MT CO_2 per year.	0.0000	0.0000
28	Green jobs	Support green job trainings and opportunities to create sustainable, living wage, quality employment opportunities.	0.0000	0.0000
Total GHG emission reductions from all CCAP strategies			**0.52**	**1.09**
Community-wide emissions with CCAP			**3.54**	**1.31**

In conjunction with existing and planned local and state programs, these updated strategies provide a flexible path to reduce the community's GHG emissions to meet the City's 2030 and 2050 emission targets and to support the State's adopted target for 2030 and its goal to achieve carbon neutrality by 2045. The City's GHG reduction targets are to reduce emissions to a level below 6.0 $MTCO_2e$ per capita by 2030 and 2.0 $MTCO_2e$ per capita by 2050 as shown in **Table ES-5**. Refer to

Chapter 5 for additional detail on GHG emissions reductions from state actions, existing City actions, and planned City actions.

Table ES-5 Progress to Absolute and Per Capita GHG Emissions Targets

Target	2030 Description	2050 Description
Baseline Emissions	8.25 $MTCO_2e$ per person	8.25 $MTCO_2e$ per person
Target	6.0 $MTCO_2e$ per person	2.0 $MTCO_2e$ per person
Emissions with All Reductions	3.52 $MTCO_2e$ per person	1.31 $MTCO_2e$ per person

Implementing the CCAP will require City leadership to put the CCAP strategies into effect and report progress. To ensure that the implementation process is efficient and transparent, this CCAP includes a work plan that identifies responsible departments, partners, time frames, and relative costs associated with each strategy. Implementation strategies are shown in **Table ES-6**.

Table ES-6 List of Implementation Strategies

CCAP Implementation Strategies
Implementation Strategy 1. Annually monitor and report progress toward CCAP target achievement.
Implementation Strategy 2. Continue collaborative partnerships with agencies and community groups that support implementation of the CCAP.
Implementation Strategy 3. Secure necessary funding to implement the CCAP.
Implementation Strategy 4. Continue to update the baseline emissions inventory and CCAP every five years.
Implementation Strategy 5. Maintain and update the CCAP to promote greater resilience.

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1. INTRODUCTION

Purpose of the Community Climate Action Plan

The Ontario Community Climate Action Plan (CCAP) serves as the strategic plan for how the City of Ontario (City) will reduce greenhouse gas (GHG) emissions and foster a sustainable community through 2050 and beyond. The Ontario Plan (TOP), the City's comprehensive plan or general plan, directs the preparation, ongoing implementation, and update of the CCAP, providing the framework for Ontario to reduce its community-wide GHG emissions in a manner consistent with the adopted state reduction target for 2030 and the longer-term goals for 2045 and 2050. This document describes the City's successes to date in reducing GHG emissions and provides a framework for continued progress. The 2022 CCAP is an update to the 2014 CCAP.

This chapter includes an updated description of the regulatory framework for the CCAP, a community profile, guiding principles for the City's climate action planning, and a summary of this update process. Subsequent chapters analyze Ontario's progress to date in meeting its adopted GHG reduction targets and contain new information to achieve more significant and longer-term GHG reductions.

The CCAP is consistent with the California Environmental Quality Act (CEQA) Guidelines for Plans for the Reduction of Greenhouse Gas Emissions (California Code of Regulations Section 15183.5). This allows the 2022 CCAP to support and streamline environmental review of GHG emissions for future development projects in the city.

2014 Community Climate Action Plan

On December 16, 2014, the City Council adopted the City's first Community Climate Action Plan (2014 CCAP), which assembled the City's existing climate action efforts into one centralized plan informed by technical analyses. The 2014 CCAP described specific strategies, actions, and cost-effective opportunities for existing and future residents, businesses, and development projects. The 2014 CCAP also served as a qualified GHG reduction strategy under CEQA, streamlining development review.

A key task of the 2014 CCAP was to establish a baseline of community GHG emissions to measure future changes and to inform actions the community could take to reduce emissions by 2020. In April 2012, Ontario developed the 2008 Community Greenhouse Gas Emissions Inventory and 2020 Forecast as part of a regional partnership with San Bernardino County, led by the San Bernardino County Transportation Authority (SBCTA). (Also referred to as the San Bernardino

Council of Governments or SBCOG.) The 2008 community-wide inventory report, included as Appendix A in the 2014 CCAP, revealed the major sources of emissions from community activities and gave a basis of comparison for the 2014 CCAP and future assessment reports. The 2014 CCAP also included a GHG emissions forecast that projected future emissions from community activities in 2020.

The 2014 CCAP included 42 measures to reduce GHG emissions across various sector such as new development; building energy; renewable energy; wastewater treatment; solid waste management; on-road transportation; off-road equipment; and water transport, distribution, and treatment. The largest potential reductions in GHG emissions came from strategies in the renewable energy, transportation, and off-road equipment sectors. The City has made continued progress in implementing the measures in the 2014 CCAP.

2022 Community Climate Action Plan

The City of Ontario prepared the 2022 CCAP to update the community's strategic path to reducing GHG emissions beyond 2020, consistent with State requirements and TOP 2050. Specifically, this CCAP does the following:

- Identifies and updates sources of GHG emissions within the City of Ontario's municipal boundaries for the calendar year of 2019 and estimates how these emissions may change over time, as presented in Chapter 3.
- Identifies GHG reduction targets in Chapter 4 that are consistent with State targets.
- Provides strategies (see Chapter 5) in various sectors to meet or exceed the state target and goals of reducing emissions 40 percent below 1990 levels by 2030 and 80 percent below 1990 levels by 2050 and in support of the State's pathway to achieve carbon neutrality by 2045, consistent with the direction of the State of California via Assembly Bill (SB) 32, Governor's Executive Order S-03-05, California Public Resources Code Section 21083.3, and Governor's Executive Order B-55-18.
- Provides substantial evidence that the emission reductions estimated in the CCAP are feasible in Chapter 5, with supporting technical detail in Appendix A.
- Provides an implementation program (see Chapter 6) and discusses the various outcomes of reduction efforts and how these reduction efforts can be implemented.

The CCAP is summarized in Section 5.8, Greenhouse Gas Emissions, of the Supplemental Environmental Impact Report for The Ontario Plan 2050. The measures included in this 2022 CCAP are not substantially different than those of the 2014 CCAP, and therefore there is no change in the environmental impacts associated with the CCAP.

How to Use This Plan

The following chapters of the 2022 CCAP provide details of the community's GHG emissions and strategies to reduce emissions.

- Chapters 1 and 2 provide an introduction and context for the CCAP, including community history and demographics, an overview of the City's existing actions to address climate change, a discussion of climate change and equity, and the relationship between the CCAP and state and regional planning efforts.
- Chapter 3, Ontario GHG Emissions, provides an introduction to climate science and describes the results of Ontario's recent-year GHG inventories and forecast GHG emissions for 2030 and 2050. This allows the community to see how its emissions have changed over time and charts progress toward state and local emissions reduction targets, informing emissions reduction strategies.
- Chapter 4, GHG Reduction Targets, outlines the GHG emission reduction targets established by state regulations and guidance and the City's GHG reduction targets. This chapter shows where the City currently stands in its efforts to reduce GHG emissions and the GHG reductions required by the 2022 CCAP to meet its targets.
- Chapter 5, GHG Emission Reduction Strategy has two sections:
  - The Existing GHG Reduction Strategies section outlines the existing and planned local and state initiatives that are expected to reduce Ontario's future GHG emissions and move the community closer to achieving its targets.
  - The New GHG Reduction Strategies section outlines the new 2022 strategies that show a viable path for Ontario to reach its established GHG emission reduction targets. This includes goals, strategies, and actions; their impacts on GHG emissions; and the co-benefits they provide to enhance ecological, economic, and social well-being. These strategies include actions that will be led by City staff and actions or project features for inclusion in certain development projects as identified by the strategy.
- Chapter 6, CCAP Implementation Strategy, describes the implementation details for the strategies in the CCAP and a potential approach to putting these strategies into effect.

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2. BACKGROUND

Community Profile and History

This section provides an overview of Ontario, highlighting key community characteristics, natural resource use, development patterns, and notable history.

Community History

Ontario is in the west San Bernardino Valley, bordered by the cities of Chino and Montclair to the west, Eastvale and Jurupa Valley to the south, Fontana to the east, and Upland and Rancho Cucamonga to the north. Ontario is well connected to the neighboring counties of Los Angeles, Orange, and Riverside by four major highways—Interstate 10 and State Route 60 traveling east-west, and State Route 83 (Euclid Avenue) and Interstate 15 traveling north-south—and by Amtrak and Metrolink stations.

Archaeological evidence dating back to 10,000 BC shows that the San Bernardino Valley has been inhabited for over 12,000 years. The Gabrieleno native peoples flourished in the west San Bernardino Valley for 3,000 years. Shortly after Spanish explorers entered the area in the 1770s, pioneers established ranching operations in the valley. Spanish rancher Don Antonio Lugo and his family managed the Rancho San Bernardino, which encompassed the entire valley, between 1842 and 1851. Subsequently, the Mormon Colony acquired the ranch. The discovery of gold in the San Bernardino Mountains initiated a period of gold and silver mining in the 1860s to 1880s.[1]

Ontario was established in the 1880s based on the founders' vision of a planned community and guiding principles that including a mutual water company, prohibition of liquor, a grand thoroughfare through the city (Euclid Avenue), and an agricultural college for general education. Ontario was incorporated in 1891, and in 1903, Ontario was declared the "Model Colony" by an Act of Congress for its establishment of a new standard for urban living.[2]

The City first developed as an agricultural community, primarily producing citrus and dairy. The town expanded around Euclid Avenue, creating what are now two of Ontario's historic districts, the Historic Downtown and the College Park Historic District. Ontario's population grew in the 1950s as the city shifted from an agricultural-based economy to an industry-based economy and manufacturing jobs became increasingly available. Mass production housing was constructed in a grid development pattern, radiating from the city's historic core, and establishing most of the suburban residential neighborhoods that dominate northwestern Ontario today.

Ontario's rapid job growth continued through the 1980s and 1990s, especially in industrial expansion of automotive plants, air cargo, commerce centers, and housing to match the growing job opportunities. During the 1980s, Ontario was ranked the seventh-fastest-growing city in California. Housing development during this period focused on master-planned communities south of Riverside Drive in the southern and eastern areas of Ontario. Today, these communities are areas of medium and high resources.[3]

As the Ontario population and economy continues to grow, urban development is transitioning the remaining agricultural land within the city limits. By 2050, all the city's agricultural land is expected to be converted to urban uses. Western Ontario Ranch (west of Archibald Avenue to Euclid Avenue), which is largely dairy and other farms, is expected to transition into a mixed-use area of residential homes, commercial centers, and industrial and business parks.

Population, Income, and Employment

Ontario is the third most populous city in San Bernardino County after San Bernardino and Fontana, with a population of 178,606 residents in 2019, which is the baseline year of the 2022 CCAP. Approximately 68 percent of the city's adult residents were below age 44 as of 2019, and nearly 37 percent of all residents were below age 24.[4]

Ontario, much like California as a whole, is experiencing racial and ethnic diversification. The percentage of non-White residents has increased to 84 percent in 2019 from 79 percent in 2010. The population of Hispanics increased by 14.5 percent between 2010 and 2019, and it is the largest ethnic group in Ontario.[5] Based on the 2019 American Community Survey, Ontario's population is 70 percent Hispanic, 16 percent non-Hispanic White, 7 percent Asian, 5 percent African American, and 2 percent multiracial. Approximately 58 percent of Ontario residents primarily speak a language other than English at home, compared with 42 percent in San Bernardino County.[6] In Ontario, the most spoken language at home is Spanish, followed by English, Tagalog, and Chinese.[7]

According to the American Community Survey (ACS), median household income has increased by 30 percent since 2010, from $57,771 to $75,266 in 2019. [8] The discrepancy in median income between Ontario and San Bernardino County has widened in the past decade. In 2010, the median income in Ontario was only 3.3 percent higher than in the county, but in 2019 the gap in median income between the city and county grew to 10 percent—$75,266 in Ontario compared with $67,903 in San Bernardino County.

The cost of housing can be particularly vexing for lower-income families, with 56 percent of families paying more than 30 percent of their income on housing. According to data from ACS, citywide median rent increased by approximately 122 percent between 2000 and 2019, outpacing the countywide median rent increase of 110 percent. On a neighborhood level, the eastern and southern areas of Ontario experienced the highest increases in rent in the city (157 and 139 percent median rent increase, respectively).[9]

EV CHARGING STATIONS

The City of Ontario currently owns 21 electric vehicle (EV) charging stations. The City partnered with Southern California Edison through the Charge Ready program to install EV charging stations at the Citizens Business Bank Arena, Ontario Convention Center, City Hall, Library, and the community center. The City continues to invest in expansion of citywide electric vehicle charging infrastructure to promote electric vehicle use. Through the Smart Ontario initiative, 4 EV charging stations are planned at City facilities. In downtown, the City plans to install 17 additional electric vehicle charging stations through a partnership with Tesla funded by the South Coast Air Quality Management District.

Ontario's economy today is still largely dominated by industrial sectors. The largest economic sector in Ontario is the logistics industry, facilitated by the city's proximity to major Southern California transportation networks and the Ontario International Airport. In 2019, the three sectors with the highest shares of employment were transportation and warehousing, waste management and remediation, and retail trade, which made up 17 percent, 13 percent, and 11 percent of jobs in Ontario, respectively.

Sustainability in Ontario

Since adopting the 2014 CCAP, Ontario has made progress in improving energy efficiency and reducing GHG emissions in both municipal operations and community-wide sectors.

To improve energy efficiency of municipal buildings and operations, the City launched the Smart Ontario initiative, which involves an energy audit of City properties, comprehensive upgrade of municipal utility infrastructure, and heating, ventilation, and air conditioning (HVAC) equipment improvements. As of March 2022, the City has retrofitted all city streetlights with light-emitting diode (LED) light fixtures as well as all interior and exterior light fixtures in City buildings (approximately 15,000); has replaced over 100 HVAC components in City facilities; and replaced 350 thermostats in all City buildings. The City has installed 1.8 megawatts of solar photovoltaic systems at the Ontario Convention Center and the Ontario Police Department, generating 2,571,125 kilowatt-hours of energy in 2019. The Smart Ontario initiative will save an estimated $75 million over the lifetime of the new equipment. To reduce the GHG emissions of newly constructed City buildings, the City

committed to all new municipal buildings achieving Leadership in Energy and Environmental Design (LEED) certified by the U.S. Green Building Council.

The City has also implemented numerous projects to reduce GHG emissions from the transportation sector, including installation of 21 EV charging stations, adoption of an Active Transportation Master Plan, synchronization of 30 percent of traffic signals in Ontario, and completion of pedestrian and bicycle infrastructure improvements through Safe Routes to School and Active Transportation Program grants. Future projects include a citywide e-scooter share program (projected to launch in March 2023), the Multimodal Transportation Center (needs assessment completed in March 2022), and the West Valley Corridor Bus Rapid Transit, a zero-emission bus line (completion expected in 2024).

Since adopting the 2014 CCAP, the City has implemented its GHG reduction measures in new development projects through the Development Review Process. This process involves documentation of GHG reduction measures incorporated into the design and construction of development projects using "screening tables" that assign point values for each measure that correspond to the minimum emission reduction expected from that measure. The use of screening tables to document implementation of CCAP strategies ensures that they will be implemented as part of the construction of new developments, helps to reduce GHG emissions in construction of new development, supports improved monitoring and evaluation of GHG reduction strategies, and ensures compliance with CEQA provisions for evaluating and mitigating climate change impacts. Implementation of the 2022 CCAP will update and continue use of screening tables for eligible projects.

NONRESIDENTIAL ELECTRICITY SAVINGS

Between 2008 and 2019, the city substantially reduced its GHG emissions from the nonresidential electricity sector, including commercial and industrial electricity use.

Absolute GHG emissions from this sector decreased by 31 percent, from 375,540 $MTCO_2e$ in 2005 to 257,820 $MTCO_2e$ in 2019.

Energy use or activity in this sector only decreased slightly during this period; the substantial decline in emissions is attributed to procurement of more renewable energy by Ontario's energy providers, in accordance with State law, and to greater energy efficiency in commercial and industrial facilities and equipment.

Climate Change and Equity

Historically and currently, institutions and structural systems drive and perpetuate inequitable distribution of resources, access to opportunities, and poor life outcomes that many frontline communities face. Examples include redlining, exclusionary housing policies, forced removal of Indigenous communities, and Jim Crow segregation. Not only did these policies exacerbate the wealth and income gap between white families and families of color, they also resulted in a greater number of lower-income and communities of color living in areas at greater exposure to environmental pollution and adverse health outcomes.

According to a citywide analysis of Housing and Community Development (HCD) Opportunity Areas, Ontario's mixture of high-resource, moderate-resource, and low-resource areas have varying urban infrastructure and levels of exposure to environmental pollutants. The State's Opportunity Mapping is a data-driven approach to measure and map the distribution of resources and opportunity in California communities. It was developed by the California Fair Housing Task Force, a group of independent organizations and research centers convened by the Department of Housing and Community Development and the California Tax Credit Allocation Committee. The approach measures opportunity through an assessment of positive or negative outcomes related to economic, educational, and health indicators across communities in comparable areas (nine identified regions in California with common economic, political, and geography characteristics), and in specific areas classified as high-poverty, racially segregated areas in which over 30 percent of the population is below the federal poverty line. The aggregate assessment of the indicators and outcomes are converted into composite scores that are used to categorize areas as "high resource", "medium resource", and "low-resource", and they are mapped to show geographic trends. The composite scores and opportunity area maps are used primarily to inform the allocation of low-income housing tax credits for eligible projects. The maps are also used to inform analyses of fair housing issues in long-term policy and planning efforts such as housing elements.

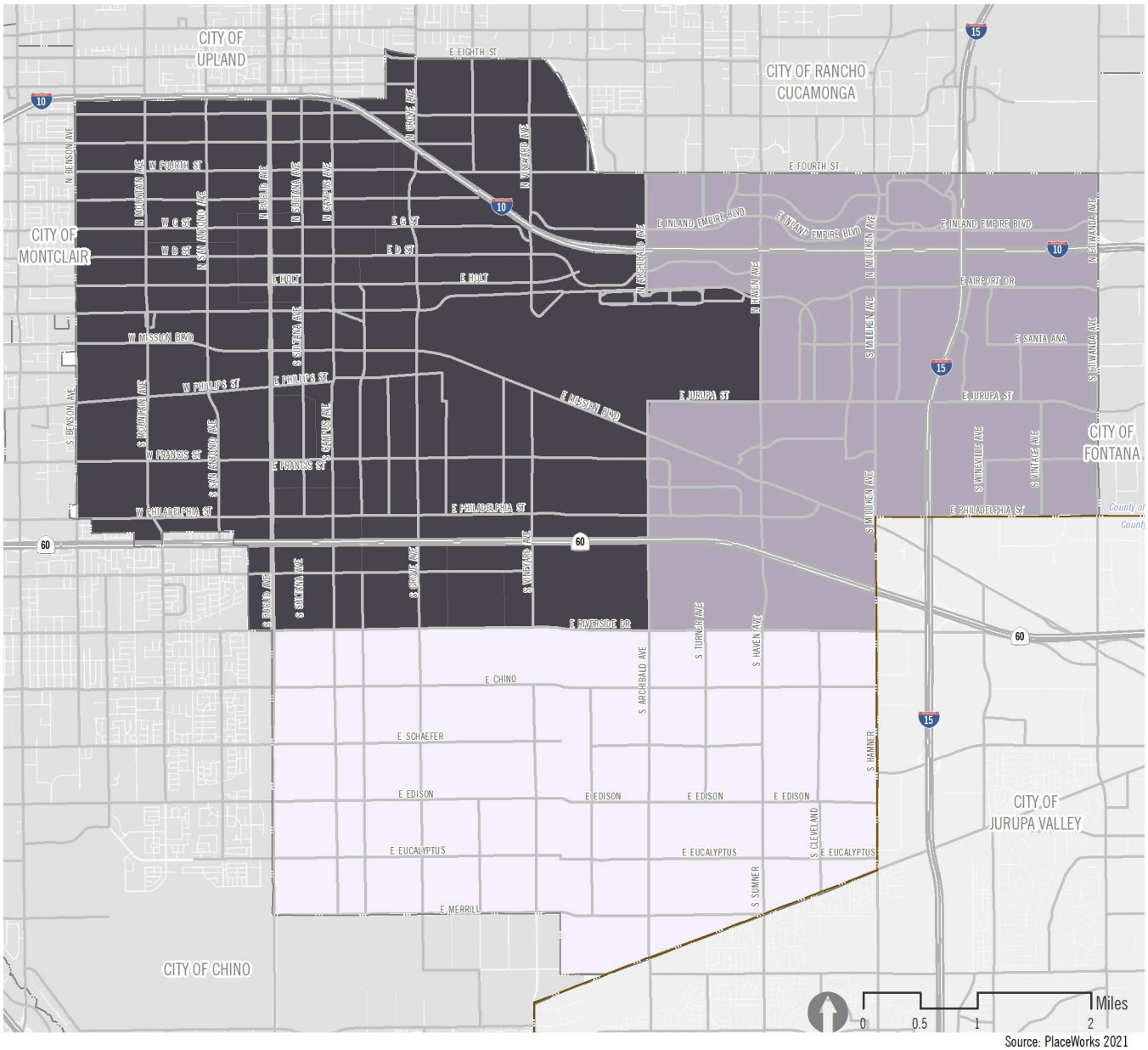
Ontario neighborhoods can be grouped into three major geographic areas based on the HCD analysis of resource distribution across the city. These areas, listed below and shown in **Figure 1**, share common socioeconomic characteristics that can be traced back to historical urban development patterns.

- **Northwestern Ontario.** West of Archibald Avenue, inclusive of Ontario International Airport to the city's western limits and north of Riverside Drive to the city's northern limits.
- **Eastern area/Eastern Ontario.** East of the Ontario International Airport and Archibald Avenue to the city limits and north of Riverside Drive.
- **South Ontario.** South of Riverside Drive, bounded by the city's southern limits.

Currently, southeastern Ontario has higher rates of owner-occupied housing and generally higher median incomes than northwestern Ontario. The southeast areas, considered Ontario's high-resource areas, are characterized by good access to employment, higher median incomes, and higher rates of home-ownership than households in northwestern Ontario. Southeastern Ontario includes much of the city's recent and future planned development, including single-family housing south of Highway 60 in eastern Ontario Ranch and business parks and industrial commerce centers in east Ontario north of Highway 60. By contrast, households in the northwestern area are primarily renter occupied, and more than half of households in this area are considered low resource, with relatively low access to education and employment opportunities.

CalEnviroScreen, a mapping tool developed by the California Office of Environmental Health Hazard Assessment, has identified similar issues. This tool uses environmental, health, and socioeconomic indicators to map and compare community environmental scores on a scale of 0 to 100. A community with a high score has higher levels of pollution and other negative environmental or social indicators. All neighborhoods in Ontario score 50 or higher, meaning that they score higher (i.e., worse) than 50 percent of neighborhoods in the state. In particular, most or all of Ontario scores high for several types of air pollution, releases of toxic materials from major goods movement transportation corridors and industrial facilities, levels of cardiovascular disease, levels of poverty, and limited educational attainment. However, the highest scores in Ontario for these and numerous other factors are concentrated in the city's low-resource areas, showing that residents of these areas are disproportionately burdened by multiple sources of pollution and socioeconomic inequities.

Figure 1 Map of Ontario



Source: City of Ontario Draft Housing Element, 2022

ONTARIO TOGETHER

Ontario Together is a community plan for advancing environmental quality and racial equity in disadvantaged communities in central Ontario. Its mission is to achieve sustainable neighborhood transformation through implementation of various GHG reduction strategies in the project area, a five-square-mile area in the heart of downtown. The strategies include improvements in access to solar energy, public transit, affordable housing, green jobs, and bicycle and pedestrian facilities for residents. Project outcomes include planting 365 trees, distributing 100 free bus passes, and implementing numerous bicycle and pedestrian infrastructure improvements, including five miles of bicycle lanes and three miles of sidewalks along Mission Blvd, and crosswalk installations on Euclid and Holt. Planned projects include Omnitrans Bus service improvements, Workforce Development, Small Business Support, and the Ontario Carbon Farm. The Ontario Carbon Farm is a partnership with Huerta del Valle Community Garden to establish a community composting site that will generate high-quality compost from food waste collected in the city.

Although the 2022 CCAP is not a dedicated equity plan, many of the factors that contribute to inequities are related to GHG emissions. For example, many sources of air pollution are also sources of GHGs, so reducing air pollution from these activities often helps to reduce Ontario's GHG emissions. Additionally, the 2022 CAP recommends numerous strategies to reduce GHG emissions that provide other co-benefits that enhance quality of life in Ontario, including improving inequities and supporting efforts to expand resources and opportunity in low-resource areas.

Through direct reductions in air pollution and indirect improvements to community well-being, the CCAP can contribute significantly in many ways to achieving a more equitable and fair Ontario. CCAP efforts that can address these issues may include:

- Improved transit service can help improve job access, provide greater mobility options for people who are unable to drive, and allow people to meet many of their daily needs at a lower cost than owning a car. Transit also releases less air pollution per rider than a private vehicle, helping to improve air quality.
- Expanded pedestrian and bicycle infrastructure can encourage more active lifestyles and recreational activities. Increased pedestrian and bicycle activity also allows people to reduce their dependencies on private vehicles and associated costs and further improves local air quality.
- Energy efficiency retrofits can result in significant cost savings for homes and businesses and help create more comfortable, safer living and working conditions.

- Green space can encourage recreation, provide shade, and improve neighborhood aesthetics.
- Increased water and energy conservation can improve community resilience to droughts and peak demand energy shortages.
- Increased adoption of solar energy systems can improve community resilience to power outages and power safety shut-off events.
- Increased demand for energy efficiency retrofits, solar and battery energy systems, electric vehicle charging installation, and water-efficient landscaping can provide new job opportunities in the community. These can be well-paying jobs that often can be made available to members of underserved communities, particularly when the community or local agencies provide free or low-cost job-training resources.

Regulatory Framework

California law first directly addressed climate change in 1988, when AB 4420 directed state agencies to prepare a GHG inventory and study the impacts of climate change. Since then, California has adopted several laws to assess climate change, analyze GHG emissions and their effects, reduce emissions, identify climate change impacts, and prepare for the impacts of climate change. Many of these laws and associated regulations affect local governments, although only some create specific requirements for individual communities. In addition to state regulations, there are local and regional planning and regulatory processes that support or direct the reduction of GHGs. These laws and associated regulations are briefly summarized in this section.

The Ontario Plan 2050

TOP 2050 provides direction on how the City will fulfill its strategic vision and manage fiscal sustainability, daily operations, and implementation of the goals and policies during the next 30 years. TOP 2050 is a "business plan" that focuses on conducting technical updates to comply with state law, including regulations that address housing, community health, environmental justice, climate adaption, and mobility. In addition, TOP 2050 focuses on long-term growth and fiscal sustainability and advancing the Implementation Plan's tracking and feedback component.[10]

Several TOP policies are relevant to climate change, including policies addressing environmental justice and policies in the Safety Element. Environmental justice policies address inequities in the built environment in compliance with Senate Bill 1000 (SB 1000). SB 1000, approved in 2016, requires local governments to identify disadvantaged communities and address environmental justice in the general plan update through policies that aim to reduce health risks in disadvantaged

communities, promote inclusive civic engagement in the planning process, and prioritize improvements that address the needs of disadvantaged communities.[11] In compliance with SB 1000, TOP 2050 identifies goals, policies, and objectives that reduce health risks caused by environmental pollution and reduce disparities in access to amenities, prioritizing improvements in disadvantaged communities most affected.

The Safety Element addresses public safety concerns related to the natural and built environment, including climate change, in compliance with SB 379. SB 379, approved in 2015, requires local governments to include a vulnerability assessment in the safety element update that identifies the unique risks to the community caused by climate change and informs policies to protect those vulnerabilities.[12] The Safety Element provides information about risks from natural and human-made hazards and includes goals, policies, and actions designed to protect the community and its property from hazards. Other TOP 2050 elements include policies and actions that affect GHG emission reduction and resilience.

- **The Land Use Element** encourages infill development, mixed-use development, and development around transit to reduce vehicle miles traveled (VMT).
- **The Housing Element** encourages development of low-income, moderate-income, and market rate housing at higher densities that meet HCD criteria for each income category.
- **The Mobility Element** addresses improvements in active transportation infrastructure based on the Ontario Active Transportation Master Plan and Transit Priority Areas.

Each of these elements plays a role in enhancing the overall sustainability and resilience of the community.

TOP 2050, which is scheduled for adoption in 2022, will reference the 2022 CCAP, recognizing the City's climate action planning efforts must be updated on a more regular basis than the General Plan to be responsive to changing regulations, guidance, technology, best practices, and science.

The San Bernardino County Regional Greenhouse Gas Reduction Plan

In 2021, SBCTA adopted an update to the San Bernardino County Regional Greenhouse Gas Reduction Plan, a regional effort to address statewide greenhouse gas emissions in response to AB 32. The plan assesses existing and projected GHG emissions for all participating communities in San Bernardino County to identify regional and local strategies to reduce GHGs. The regional effort is the product of an informal partnership among 25 jurisdictions, including the City of Ontario, led by SBCTA. The plan includes a 2016 GHG inventory, GHG emissions forecasts for 2030 and 2045, and strategies for reducing emissions in Ontario, including 7 state measures and 27 local measures. The GHG reduction measures have been vetted and adopted by all 25 partnership

cities. The plan is accompanied by an assessment, monitoring, and implementation tool, called the San Bernardino County GHG Reduction Tool, which allows the City to quantify emissions reductions and measure progress in achieving emissions reductions from state and local measures. The 2022 Ontario CCAP is consistent with the regional plan and draws from the plan's GHG reduction strategies.

Title 24: Building Standards Code

Title 24 is the section of the California Code of Regulations that establishes standards to promote energy efficiency, public health, and greenhouse gas reduction standards for the construction of new commercial, residential, and public school buildings. Title 24 includes Part 6, Building Energy Efficiency Standards (also known as the Energy Code), which is focused on reducing energy consumption of new buildings, and Part 11, CALGreen Code, which is focused on reducing environmental impacts and improving public health through mandatory measures in the building sector.[13]

Title 24 is applied at the local level through the building permit and development review process, implemented through the municipal building code. On November 19, 2019, the City enacted an ordinance to amend the municipal code and adopt by reference the 2019 California Building Standards Code, which includes the CALGreen Code. This ordinance will require compliance with statewide Title 24 standards that improve energy efficiency, public health, and environmental sustainability in new homes and nonresidential buildings, such as high-efficiency electric air and water heating systems, improved ventilation systems, and rooftop solar and battery storage systems.[14] This CCAP was prepared with the 2019 standards in effect. The next update, the 2022 Title 24 standards, will go into effect on January 1, 2023.

South Coast Air Quality Management District

The South Coast Air Quality Management District (SCAQMD) is the regional air district responsible for air quality regulation in most of Southern California, including Ontario and the rest of the valley region of San Bernardino County. The SCAQMD's primary responsibility is to regulate stationary sources and develop plans to achieve and maintain air quality standards.

Released in 2016, the latest update to the SCAQMD's Air Quality Management Plan (AQMP) provides a regional strategy to protect public health and the environment to eliminate health risk disparities from exposure to air pollution among Southern California communities. To make progress toward all state and federal air quality standards, the 2016 Air Quality Management Plan includes a wide range of goals in partnership with other agencies to decrease critical pollutants, greenhouse gases, and toxins as well as improve efficiency of energy use, on-road transportation, and goods movement. The most effective way to reduce air pollution impacts to residents of the

Southern California region, especially disproportionately impacted communities along transportation corridors, is to reduce emissions from mobile sources such as vehicles, buses, and trucks. The SCAQMD has partnered with the California Air Resources Board (CARB) and the U.S. Environmental Protection Agency (EPA) to update the AQMP to address mobile sources, including transportation control measures developed by the Southern California Association of Governments (SCAG). The 2016 plan emphasizes collaboration between agencies to develop new regulations that monitor and control emissions and the pursuit of grant funding and incentives to accelerate the adoption of cleaner technologies in vehicles, buildings, and industrial facilities.

The South Coast Air Basin is classified as an extreme nonattainment area for ground-level ozone under the EPA's current National Ambient Air Quality Standards, which means that it greatly exceeds the threshold for ozone levels deemed acceptable for human health. The 2022 AQMP is in the process of being updated and will include requirements for meeting the 2015 ozone National Ambient Air Quality Standards. According to the EPA, GHG emissions and ozone levels are correlated because ozone formation in the atmosphere accelerates as temperature increases. Ozone exposure can exacerbate human health conditions such as cardiovascular disease, asthma, and other respiratory diseases.[15]

Warehouse Indirect Source Rule 2305

On May 8, 2021, South Coast AQMD adopted Warehouse Indirect Source Rule 2305, which includes the Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program and Rule 316. Rule 2305 establishes for the first time in Ontario a regulatory program designed to reduce air pollution (and indirect GHG emissions) caused by warehouse-related activities and is focused on emissions from vehicles that service large warehouses.

State of California Regulations and Guidance

California has adopted several laws to assess climate change, analyze GHG emissions and their effects, reduce emissions, and prepare for the impacts of climate change. These laws and associated regulations are briefly summarized here.

Executive Order S-03-05

In 2005, Governor Arnold Schwarzenegger issued Executive Order (EO) S-03-05, which established the first statewide GHG reduction goals for California: reduce emissions to 2000 levels by 2010, reduce emissions to 1990 levels by 2020, and reduce emissions 80 percent below 1990 levels by 2050.

Assembly Bill 32: California Global Warming Solutions Act of 2006

State of California guidance and targets for reductions in GHG emissions are generally embodied in the Global Warming Solutions Act, adopted with passage of AB 32 by the California state legislature on August 31, 2006. AB 32 follows the 2020 emissions reduction goal established in EO S-03-05. AB 32 includes the major GHGs and groups of GHGs that are being emitted into the atmosphere. These gases include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3).

Through the adoption of AB 32, the California Legislature declared:

> (a) Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems.
>
> (b) Global warming will have detrimental effects on some of California's largest industries, including agriculture, wine, tourism, skiing, recreational and commercial fishing, and forestry. It will also increase the strain on electricity supplies necessary to meet the demand for summer air-conditioning in the hottest parts of the state.

Climate Change Scoping Plan

The Climate Change Scoping Plan (Scoping Plan), adopted in 2008 and updated in 2014 and 2017, employs a variety of GHG reduction strategies that include direct regulations, alternate compliance mechanisms, incentives, voluntary actions, and market-based approaches like a cap-and-trade program. The 2008 Scoping Plan identified local governments as strategic partners to achieving the state goal and translated California's 2020 GHG reduction goal of returning to 1990 emission levels to a 15 percent reduction of "existing" emissions by 2020 (emissions between 2005 and 2008). On December 14, 2017, CARB adopted the 2017 Climate Change Scoping Plan Update (2017 Scoping Plan) to address the 2030 target and 2050 goal for the state. The 2017 Scoping Plan lays out a path to reduce statewide GHG emissions 40 percent below 1990 levels by 2030.

California's climate strategy outlined in the 2017 Scoping Plan requires contributions from all sectors of the economy, including enhanced focus on zero-emission vehicles (ZEVs) and near-ZEV technologies; continued investment in renewables such as solar roofs, wind, and other types of distributed generation; greater use of low carbon fuels; integrated land conservation and development strategies; coordinated efforts to reduce emissions of short-lived climate pollutants

(methane, black carbon, and fluorinated gases); and an increased focus on integrated land use planning to support livable, transit-connected communities and conserve agricultural and other lands. Requirements for GHG reductions at stationary sources complement local air pollution control efforts by the local air districts to tighten criteria air pollutant and toxic air contaminant emissions limits on a broad spectrum of industrial sources.

In addition to these statewide strategies, the 2017 Climate Change Scoping Plan identified local governments as essential partners in achieving the state's long-term GHG reduction goals and recommended local actions to reduce GHG emissions. It proposes goals for local governments to reduce their GHG emissions to 40 percent below 2020 levels by 2030 (1,128,580 metric tons of CO_2 equivalent [$MTCO_2e$]) and 80 percent below 2020 levels by 2050, consistent with statewide reduction goals. In per capita terms, statewide guidance recommends targets of to 6 $MTCO_2e$ per capita by 2030, and 2 $MTCO_2e$ per capita by 2050 (376,190 $MTCO_2e$). CARB recommends that local governments evaluate and adopt robust and quantitative, locally appropriate goals that align with the statewide per capita targets and sustainable development objectives and develop plans to achieve the local goals.

As of April 2022, CARB is working on a third update to the Scoping Plan in response to the adoption of Senate Bill 32 in 2016 and the governor's 2018 goal of achieving statewide carbon neutrality by 2045. The updated Scoping Plan was released for public review in May 2022 and is set to be adopted sometime in late 2022.

California Cap-and-Trade Program

The Cap-and-Trade Program, which took effect in 2012, was originally developed under AB 32 as a market mechanism-based measure to reduce statewide emissions and move the state toward meeting the year 2020 GHG reduction target. In 2017, passage of Assembly Bill 398 extended the program to 2030, which coincides with the year 2030 GHG reduction target set under SB 32. The Cap-and-Trade Program would deliver the additional GHG reductions necessary to ensure that the 2030 GHG reduction target is met.[16] Overall, the program covers approximately 85 percent of all emissions in California and covers a variety of emissions sectors, such as electricity generators and large industrial facilities, which include refineries that generate 25,000 $MTCO_2e$ or more per year. In addition, the program also covers distributors of transportation fuels and requires fuel distributors to reduce GHG emissions by either supplying low carbon fuels or purchasing pollution permits to cover GHG emissions generated from combustion of conventional petroleum-based fuel the distributors supply.[17]

Senate Bill 375: Sustainable Communities and Climate Protection Act of 2008

In 2008, SB 375, the Sustainable Communities and Climate Protection Act, was adopted to connect the GHG emissions-reductions targets established in the 2008 Scoping Plan to local land use decisions that affect travel behavior. Its intent is to reduce GHG emissions from light-duty trucks and automobiles (excludes emissions associated with goods movement) by aligning regional long-range transportation plans, investments, and housing allocations to local land use planning to reduce VMT and vehicle trips. Specifically, SB 375 required CARB to establish GHG emissions-reduction targets for each of the 18 metropolitan planning organizations. SCAG is the metropolitan planning organization for the Southern California region, which includes the City of Ontario. Pursuant to the recommendations of the Regional Transit Technical Advisory Committee (RTTAC), CARB adopted per capita reduction targets for each of the metropolitan planning organizations. The reduction targets for the Southern California Association of Governments are to reduce GHG emissions from passenger vehicles and light duty trucks by 8 percent per capita by 2020 and 19 percent by 2035 relative to 2005 emissions levels.[18]

Executive Order B-30-15

EO B-30-15 was signed April 29, 2015, by Governor Jerry Brown and set a goal to reduce GHG emissions in the state to 40 percent below 1990 levels by year 2030. EO B-30-15 directed CARB to update the Scoping Plan to quantify the 2030 GHG reduction goal for the state and requires state agencies to implement strategies to meet the interim 2030 goal. It also requires the California Natural Resources Agency to conduct triennial updates of the California adaption strategy, Safeguarding California, to ensure climate change is accounted for in state planning and investment decisions.

Senate Bill 32 and Assembly Bill 197

In September 2016, Governor Brown signed SB 32 and AB 197, making the Executive Order goal for year 2030 into a statewide, mandated legislative target. AB 197 established a joint legislative committee on climate change policies and requires CARB to prioritize direct emissions reductions rather than the market-based cap-and-trade program for large stationary, mobile, and other sources.

Executive Order B-55-18

Executive Order B-55-18, signed September 10, 2018, sets a goal "to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter". EO B-55-18 directs CARB to work with relevant state agencies to ensure future Scoping Plans identify and recommend measures to achieve the carbon neutrality goal. The goal of carbon neutrality by 2045 is in addition to other statewide goals, meaning that not only should emissions

be reduced to 80 percent below 1990 levels by 2050, but that, by no later than 2045, the remaining emissions should be offset by equivalent net removals of CO_2e from the atmosphere, including through sequestration in forests, soils, and other natural landscapes.

Executive Order N-79-20

On September 23, 2020, Governor Newsom issued EO N-79-20, which sets a time frame for the transition to ZEVs, including passenger vehicles, trucks, and off-road equipment. It directs CARB to develop and propose passenger vehicle and truck regulations requiring increasing volumes of new ZEVs sold in the California toward the target of 100 percent of in-state sales by 2035, and similar regulations for medium- and heavy-duty vehicles to achieve a target of 100 percent fleet electrification by 2045. In addition, Executive Order N-79-20 provides strategies—in cooperation with other state agencies, the EPA, and local air districts—to achieve 100 percent zero emissions from all off-road vehicles and equipment operations in California by 2035.

State Regulations of GHG Emissions from Medium- and Heavy-Duty Trucks

Existing heavy-duty vehicle regulations in California include engine criteria emission standards, tractor-trailer GHG emission reduction requirements, and in-use fleet retrofit requirements, such as the Truck and Bus Regulation. The following state strategies reduce GHG emissions from medium- and heavy-duty trucks:

- CARB's Phase 1 and 2 Heavy-Duty Vehicle GHG Standards establish emission limits on truck and engine manufacturers and harmonize with the EPA rule for new trucks and engines nationally.
- CARB's Mobile Source Strategy focuses on reducing GHGs through the transition to ZEVs and low-emission vehicles and from medium-duty and heavy-duty trucks.[19]
- CARB's Advanced Clean Fleets regulation, starting in 2025, will require public agencies, drayage operations, and high-priority fleets to prepare for the transition to zero-emission trucks and buses where feasible.
- CARB's Advanced Clean Trucks regulation, starting in 2025, will require that manufacturers of trucks meet a minimum sales requirement for ZEVs.
- CARB's Sustainable Freight Action Plan establishes a goal to improve freight efficiency by 25 percent by 2030, deploy over 100,000 freight vehicles and equipment capable of zero-emission operation, and maximize both zero-emissions and near-zero emission freight vehicles and equipment powered by renewable energy by 2030.[20]

- CARB's Emissions Reduction Plan for Ports and Goods Movement (Goods Movement Plan) in California focuses on reducing heavy-duty truck-related emissions by the establishment of emissions standards for trucks, fleet turnover, truck retrofits, and restriction on truck idling.
- CARB's Small Off-Road Engines (SORE) regulation that will require most newly manufactured small off-road equipment, such as leaf blowers and lawn mowers, to meet zero-emission standards by 2024, and portable generators to meet these standards in 2028.

These state regulations would contribute to reducing medium-duty and heavy-duty truck GHG emissions in Ontario.

California Environmental Quality Act

CEQA requires that many proposed development projects conduct an environmental review to identify how the project may impact the environment, including an analysis of GHG emissions from the project and their contribution to climate change. The guidelines encourage the adoption of policies or programs as a means of comprehensively addressing the cumulative GHG emissions and associated impacts of projects (See CEQA Guidelines, Sections 15064(h)(3) and 15130 (c)). Consistent with the CEQA Guidelines, lead agencies may use adopted GHG reduction plans to assess the cumulative impacts of discretionary projects on climate change. In addition, the CEQA Guidelines provide a mechanism to streamline development review of future projects.

Specifically, lead agencies may use adopted plans consistent with State CEQA Guidelines Section 15183.5 to analyze and mitigate the significant effects of GHGs under CEQA at a programmatic level by adopting a plan for the reduction of GHG emissions. Later, as individual projects are proposed, project-specific environmental documents may tier from and/or incorporate by reference that existing programmatic review in their cumulative impact analysis. If a proposed development within the City of Ontario is consistent with the emission reduction strategies included in the CCAP and the programs are developed as a result of the CCAP, the project would have a less-than-significant impact on climate change.

A project-specific environmental document that relies on this 2022 CCAP for its cumulative impacts analysis must identify specific GHG reduction strategies applicable to the project and demonstrate the project's incorporation of the strategies. Project applicants and City staff will identify specific strategies applicable to each project during project review. If applicable strategies are not otherwise binding and enforceable, they must be incorporated as mitigation strategies for the project. If substantial evidence indicates that the GHG emissions of a proposed project may be cumulatively considerable, notwithstanding the project's compliance with specific strategies in this 2022 CCAP, an Environmental Impact Report (EIR) must be prepared for the project.

This 2022 CCAP meets the CEQA Guidelines and commitments, as follows:

- Quantifies emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area.
- Establishes a level, based on substantial evidence, below which the contribution of emissions from activities covered by the plan would not be cumulatively considerable. The 2022 CCAP builds off the 2014 CCAP's GHG reduction targets by establishing two new targets for 2030 and 2050, consistent with State guidance, and provides substantial evidence for how Ontario can meet these targets and provide substantial progress toward the State's statewide goal of carbon neutrality by 2045.
- Identifies and analyzes the emissions resulting from specific actions or categories of actions anticipated within the geographic area.
- Specifies strategies and associated actions, that, if implemented, substantial evidence demonstrates they would collectively achieve the specified future per capita emissions level.
- Establishes a mechanism to monitor the 2022 CCAP's progress toward achieving specific levels and to require amendment if the plan is not achieving those levels.
- Environmental review of the CCAP has been conducted as a component of the Supplemental Environmental Impact Report (SEIR) for The Ontario Plan 2050. As identified in the Draft SEIR, the CCAP is summarized in Section 5.8, Greenhouse Gas Emissions. The measures included in the 2022 update to the CCAP are not substantially different than those of the 2014 CCAP, and therefore there is no change in the environmental impacts associated with the CCAP.

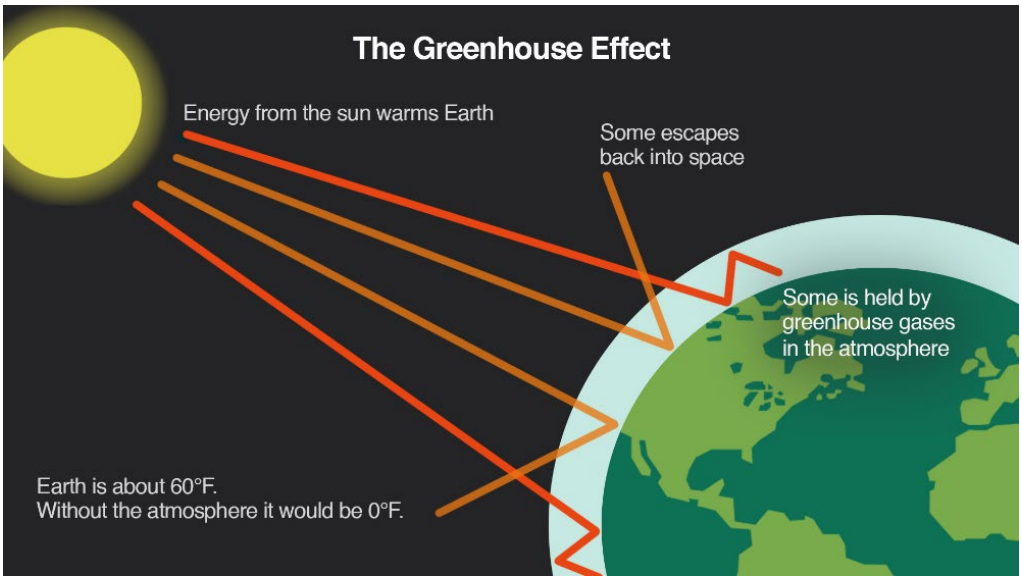
3. ONTARIO'S GREENHOUSE GAS EMISSIONS

Climate Science

Climate is the long-term average of weather conditions, such as temperature and precipitation. While it is normal for Earth's climate system to experience long-term shifts in these average conditions, human activity is causing global climate change at a much faster pace than in the past. These activities, predominantly the burning of fossil fuels, emit heat-trapping gases called GHGs that build up in the atmosphere. As GHG levels increase, Earth's atmosphere traps more heat, triggering changes in the global climate system that may have serious and potentially catastrophic impacts on people, community assets, and natural systems.

The heat-trapping effect of GHGs is known as the "greenhouse effect" because the Earth's atmosphere acts like a greenhouse, warming the planet in much the same way that an ordinary greenhouse warms the air inside its glass walls. This process is shown in **Figure 2**.

Figure 2 The Greenhouse Effect



Source: Climate Central[21]

GHGs are naturally occurring gases, such as water vapor, carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), that absorb heat radiated from the Earth's surface. GHGs are transparent to certain wavelengths of the Sun's radiant energy, including visible light, allowing sunlight to penetrate deep into the atmosphere or all the way to Earth's surface. Clouds, ice caps, and particles in the air reflect about 30 percent of this radiation, but oceans and land masses absorb the remaining 70 percent before releasing it back toward space as infrared radiation. GHGs and clouds effectively prevent some of the infrared radiation from escaping; they trap the heat near Earth's surface where it warms the lower atmosphere. The Intergovernmental Panel on Climate Change (IPCC) states that if this natural barrier of atmospheric gases was not present, the heat would escape into space, and Earth's average global temperatures could be as much as 61 degrees Fahrenheit (°F) cooler.[22]

The IPCC's Sixth Assessment Report summarizes the latest scientific understanding of global climate change and projects future conditions using the most comprehensive set of recognized global climate models. The report, released in 2021, considers all impacts that human activities have on global climate, temperature, natural and managed ecosystems, natural resources, human mental and physical health, human migration, urban infrastructure, and food systems. The report describes the existing impacts of atmospheric warming that are currently being observed as a result of the atmospheric imbalance and projected conditions under different scenarios, depending on the success of climate mitigation on a global scale. The report states that:

> ... widespread and severe loss and damage to human and natural systems are being driven by human-induced climate changes increasing the frequency and/or intensity and/or duration of extreme weather events, including droughts, wildfires, terrestrial and marine heatwaves, cyclones (high confidence), and flood (low confidence). Extremes are surpassing the resilience of some ecological and human systems, and challenging the adaptation capacities of others, including impacts with irreversible consequences (high confidence).[23]

Human activities are exerting a major and growing influence on the climate by changing the composition of the atmosphere and by modifying the land surface. Particularly, the increased consumption of fossil fuels (e.g., natural gas, coal, gasoline) has substantially increased atmospheric levels of GHGs. The Sixth Assessment Report projects five different temperature scenarios, all of which project 2021–2040 temperatures 2.16°F to 3.2°F warmer than the 1986–2005 average temperature, and potentially over 10.26°F warmer by 2100 under the highest emissions scenario.

The Sixth Assessment Report notes that if trends remain unchanged, continued GHG emissions above current rates will lead to further changes in the global climate system and pose even greater risks than those currently seen.

Local GHG Emissions

A community-wide GHG inventory identifies GHG emissions that result from activities of Ontario residents, employees, visitors, and other community members. Examples include residents driving cars, homes using water, and businesses using electricity. A forecast is a projection of these emissions for future years. Preparing the GHG inventory and forecast is the first step in creating a strategy to reduce Ontario's annual emissions. Determining the annual level of GHG emissions helps the City to establish attainable goals for reducing emissions and develop policies and programs to achieve those goals.

In some cases, the GHG emissions themselves are occurring within the city limits of Ontario, such as emissions from combustion of natural gas used in community homes or businesses. In some cases, the activity occurs within Ontario, but the emissions occur elsewhere, such as GHG emissions from power plants in other communities that generate the electricity used in Ontario. In a few cases, the activity occurs partially in Ontario and partially elsewhere, such as emissions from vehicle trips between Ontario and another community. Overall, the community-wide inventory is an assessment of GHG emissions that are attributed to Ontario, although the emissions themselves or even the activities may not occur within the Ontario city limits.

As part of the preparation of the 2014 CCAP, the City of Ontario and its regional partners and technical consultants prepared community-wide GHG inventories for the calendar year 2008 and a projection of GHG emissions in 2020. The 2014 CCAP identified the year 2008 as the baseline year for emission reductions because this was considered a year with good data availability at the time, consistent with state guidance, and without any unusual factors that might affect GHG emissions. In 2021, SBCTA prepared a regional GHG inventory for the calendar year 2016 as part of the San Bernardino County Regional GHG Reduction Plan.

As part of the 2022 CCAP, the City prepared a set of new and revised community-wide GHG inventories and forecasts. The project team prepared a new 2019 community-wide GHG inventory, revised the existing 2008 and 2016 inventories to ensure they used the same methods and data sources as the 2019 inventory so they could be accurately compared, and prepared 2030 and 2050 forecasts. The team selected 2019 for the new inventory since 2019 was the most recent year with complete data that was not affected by the COVID-19 pandemic, as the changes in GHG emissions created by the pandemic are expected to be mostly temporary and are not an appropriate basis for long-term GHG emission planning.

This chapter presents the results of the updated and new City of Ontario community-wide GHG inventories and forecasts and a discussion of the methods used to prepare and update the GHG inventories.

Community-Wide GHG Inventory

Protocols and Methods

A series of guidance documents, called protocols, recommend how to adequately assess GHG emissions. The project team prepared the new GHG inventory and updated the past GHG inventories consistent with the guidance in widely adopted, standard protocol documents. These protocols provide guidance on what activities should be evaluated in the GHG inventories and how emissions from those activities should be assessed. Using standard methods also allows an easy comparison of GHG emission levels across multiple years and communities.

The community-wide GHG inventory uses the United States Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (U.S. Community Protocol), which was first developed in 2012 and updated most recently in 2019. The California Governor's Office of Planning and Research encourages cities and counties in California to follow the U.S. Community Protocol for community-wide GHG emissions.

The Global Protocol for Community-Scale Greenhouse Gas Inventories (Global Protocol) was first developed in 2014 for preparing international community-scale GHG inventories. It is mostly consistent with the U.S. Community Protocol, although it contains additional guidance and resources to support a wider range of activities in other countries. The project team used the Global Protocol to assess GHG emissions from sources that are not covered in the U.S. Community Protocol.

GHG inventories are estimates of GHG emissions based on these standard methods and verified datasets. They are not direct measurements of GHG emissions, but when the standard methods in the protocols are used with accurate data from appropriate sources, GHG inventories provide reliable estimates of local emission levels. However, due to potential data limitations, some inconsistencies in methods may remain. Any concerns about inconsistent methods are noted in the appropriate sector discussion.

UNITS OF MEASURE AND EMISSION FACTORS

GHG inventories assess emissions in a unit called carbon dioxide equivalent (CO_2e), which is a combined unit of all GHGs analyzed in the inventory. Because different GHGs have different effects on the processes that drive climate change, CO_2e is a weighted unit that reflects the relative potency of the different GHGs. These inventories report amounts of GHGs in metric tons of CO_2e ($MTCO_2e$), that is, 1,000 kilograms or approximately 2,205 pounds.

The project team calculated most of the GHG emissions using data on GHG-generating activities in combination with emission factors. An emissions factor describes how many metric tons of CO_2e emissions are released per unit of an activity. For instance, an emissions factor for electricity describes the $MTCO_2e$ emissions produced per kilowatt-hour (kWh) of electricity used, and an emission factor for on-road transportation describes the $MTCO_2e$ emissions produced per mile of driving. **Table 1** shows the emissions factors for 2019. Some sectors do not have specific emission factors, including agriculture and off-road emissions, and were calculated using formulae or models.

Table 1 Emissions Factors, 2008 to 2019

Sector	Unit	2008	2016	2019	Percentage Change, 2008–2019	Source
SCE electricity	$MTCO_2e$/ kWh	0.000295	0.000256	0.000208	-29%	SCE
Natural gas	$MTCO_2e$ / therm	0.005677	0.007341	0.005272	-7%	US Community Protocol
On-road transportation (light- and medium-duty vehicles)	$MTCO_2e$ / mile	0.000432	0.000363	0.000348	-19%	California Air Resources Board
On-road transportation (heavy-duty vehicles)	$MTCO_2e$ / mile	0.001007	0.001248	0.001256	25%	California Air Resources Board
On-road transportation (total)	$MTCO_2e$ / mile	0.000478	0.000430	0.000434	-9%	California Air Resources Board
Municipal solid waste (MSW)	$MTCO_2e$ / ton	0.296215	0.286062	0.286062	-3%	CalRecycle
Alternative daily cover (ADC)	$MTCO_2e$ / ton	-	-	0.247191	-	CalRecycle

Sectors

The community-wide GHG inventory assessed GHG emissions from nine categories of activities, known as sectors.

- **Transportation.** GHG emissions created by driving on-road vehicles in Ontario, including passenger and freight vehicles.
- **Residential energy.** GHG emissions attributed to the use of electricity and natural gas in residential buildings.
- **Nonresidential energy.** GHG emissions attributed to the use of electricity and natural gas in nonresidential buildings.
- **Solid waste.** GHG emissions released from trash collected from residents and businesses.
- **Off-road equipment.** GHG emissions from equipment that does not provide on-road transportation (excluding agricultural equipment), such as tractors for construction or equipment used for landscape maintenance.
- **Agriculture.** GHG emissions from various agricultural activities, including agricultural equipment, crop cultivation and harvesting, and livestock operations.
- **Water and wastewater.** This sector accounts for the electricity used to transport every gallon of water to or wastewater from city residents and businesses, as well as direct emissions from processing wastewater.
- **Land use and sequestration.** Emissions released into the atmosphere from development of previously undeveloped land and GHG emissions absorbed and stored in trees and soils on locally controlled lands as part of healthy ecosystems.
- **Stationary sources.** Emissions from fuel use at major industrial facilities permitted by state and regional air quality authorities. Stationary source emissions are informational and are not included in the community total.

Per Capita GHG Emissions

In addition to analyzing absolute or total community-wide GHG emissions, the project team also assessed GHG emissions per capita (per person) in Ontario. Per capita emissions show the average number of emissions per service population, which is the sum of community residents and employees in Ontario, so the service population per capita emissions account for activities of both residents and workers in Ontario. Per capita GHG emissions show changes in emissions over time

and are helpful for showing consistency with state-recommended GHG reduction targets. **Table 2** provides demographic context for the GHG inventory by showing a summary of change in population, households, jobs, service population, and VMT between 2008 and 2019. Throughout this document, the GHG emissions are presented in terms of per capita emissions using units of $MTCO_2e$ per person in the Ontario service population.

Table 2 City of Ontario Community-Wide Demographic Change, 2019

Metric	2008	2016	2019	Percentage Change 2008–2019	Relevant Sectors
Population	163,951	172,249	178,606	9%	Off-road equipment
Households	44,673	46,001	48,275	8%	Residential energy, off-road equipment
Residents per household	104,233	113,859	128,637	23%	None
Jobs	268,184	286,108	307,243	15%	Nonresidential energy, off-road equipment
Service population	163,951	172,249	178,606	130%	Solid, water and wastewater, off-road equipment
Vehicle Miles Traveled (VMT)	1,969,786,450	1,995,399,670	2,151,423,590	9%	Transportation

Sources: 2019 demographic numbers are from US Census, the Department of Finance, and San Bernardino County Transportation Authority (SBCTA).

Notes: Service population is the sum of populations and jobs. All numbers except residents per household are rounded to the nearest 10.

Inventory Results

The 2022 CCAP includes 2008 and 2016 community-wide GHG inventories from the San Bernardino Regional GHG Reduction Plan, with a few additional sources of GHG emissions and some changes to the methods to be consistent with current guidance, and a 2019 community-wide GHG inventory.

Table 3 and Figure 3 show the per capita GHG emissions by sector for the three inventory years. Per capita emissions in Ontario decreased from approximately 8.25 $MTCO_2e$ in 2008 to approximately 5.55 $MTCO_2e$ per person in 2019, a decrease of 33 percent. In terms of absolute GHG emissions, Ontario's community-wide GHG emissions decreased from 2,212,900 $MTCO_2e$ in 2008 to 1,703,730 $MTCO_2e$ in 2019, a decrease of approximately 23 percent. The sectors with the highest per capita emissions corresponded with the highest-emitting sectors, the transportation and nonresidential energy sectors. Table 4 shows how each of the community's sectors contributes to annual GHG emissions.

Table 3 Annual Per Capita GHG Emissions by Sector, 2008 to 2019

SECTOR	2008 $MTCO_2e$	2016 $MTCO_2e$	2019 $MTCO_2e$	Percentage Change, 2008–2019
Transportation	3.51	3.00	3.04	-13%
Nonresidential energy	2.77	1.80	1.29	-54%
Residential energy	0.72	0.55	0.50	-30%
Solid waste	0.28	0.22	0.27	-4%
Off-road equipment	0.17	0.08	0.21	23%
Agriculture	0.63	0.21	0.16	-75%
Water and wastewater	0.15	0.08	0.06	-56%
Land use and sequestration	0.01	0.00	0.00	-77%
Total	**8.25**	**5.95**	**5.54**	**-33%**
Informational Items				
Stationary sources	1.50	0.25	1.05	-30%

Figure 3 Annual Per Capita GHG Emissions by Sector, 2008 to 2019

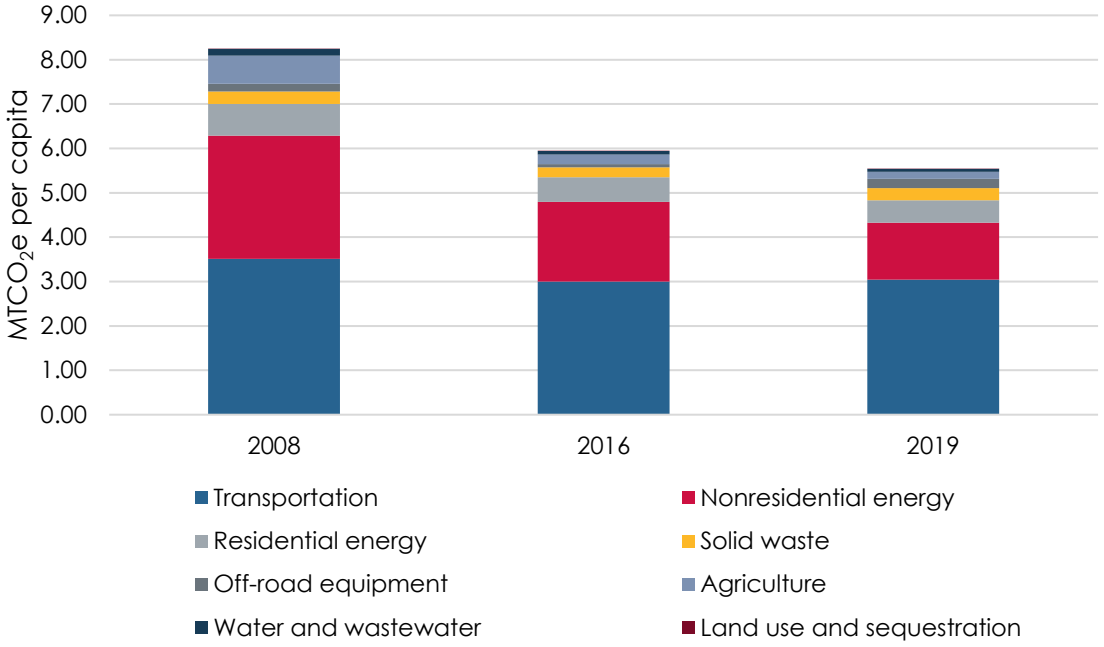


Table 4 Proportions of Annual Per Capita GHG Emissions by Sector in 2008 to 2019

Sector	2008 Proportion of Total	2016 Proportion of Total	2019 Proportion of Total
Transportation	43%	50%	55%
Nonresidential energy	34%	30%	23%
Residential energy	9%	9%	9%
Solid waste	3%	4%	5%
Off-road equipment	2%	1%	4%
Agriculture	8%	4%	3%
Water and wastewater	2%	1%	1%
Land use and sequestration	Less than -1%	Less than -1%	Less than -1%
Total annual $MTCO_2e$ per capita	**100%**	**100%**	**100%**

The four sectors that experienced the largest decreases in annual per-capita GHG emissions between 2008 and 2019 are land use and sequestration, agriculture, water and wastewater, and nonresidential energy, which reduced emissions by 77 percent, 75 percent, 56 percent, and 54 percent, respectively. These changes are discussed more in the sector detail discussions below but are likely due to increases in supplies of renewable and carbon-free electricity, declines in natural gas use, and changes in agricultural activities and land use patterns.

The only sector that experienced an increase in per capita emissions is the off-road equipment sector. Between 2008 and 2019, emissions from off-road equipment increased by 23 percent.

- The transportation sector remains the largest source of GHG emissions in Ontario, and this sector's share of community-wide GHG emissions has increased over time. Transportation emissions made up 43 percent, 50 percent, and 55 percent of total GHG emissions in 2008, 2016, and 2019, respectively.
- The transportation sector is followed by the nonresidential and residential energy sectors as the second- and third-largest sources of GHG emissions.
  - The nonresidential energy sector's share of GHG emissions steadily decreased between 2008 and 2019, from 34 percent in 2008 to 23 percent in 2019.
  - The residential energy sector's share of GHG emissions remained constant (9percent) between 2008 and 2019.
- Solid waste is the fourth-largest source of GHG emissions. This sector's share of GHG emissions increased steadily from 3 percent in 2008 to 5 percent in 2019. Similarly, the off-road equipment sector's share of GHG emissions increased from 2 percent to 4 percent between 2008 and 2019.
- The agriculture sector's share of GHG emissions decreased dramatically, from 8 percent in 2008 to 3 percent in 2019. The land use and sequestration sector, the smallest source of GHG emissions in Ontario, remained at less than 1 percent during this period.
- The water and wastewater sector's share of GHG emissions also decreased, from 2 percent in 2008 to 1 percent in 2019.

Sector Details

Transportation

City of Ontario community members drove approximately 1.97 billion vehicle miles in 2008, which increased 9 percent to 2.15 billion vehicle miles in 2019.[24] The VMT in 2008 resulted in the release of approximately 942,020 $MTCO_2e$ which dropped to approximately 934,590 $MTCO_2e$ in 2019, a 1 percent decrease in absolute emissions. In per capita terms, on-road vehicle emissions decreased from 3.51 $MTCO_2e$ per capita in 2008 to 3.04 $MTCO_2e$ per capita in 2019, a decrease of 13 percent. There was a slight decrease in emissions despite an increase in VMT during this period due to the increasing use of fuel-efficient and electric vehicles. **Table 5** provides a breakdown of the activity data and per capita emissions for on-road transportation in the 2008, 2016, and 2019 community-wide inventory.

Table 5 Transportation Activity Data and Per Capita GHG Emissions by Subsector, 2008 to 2019

Sector	2008	2016	2019	Percentage Change, 2008–2019
Activity data (VMT)				
Light duty vehicles	1,767,683,550	1,843,389,270	1,945,876,580	10%
Heavy duty vehicles	202,102,900	152,010,400	205,547,010	2%
Total annual VMT	**1,969,786,450**	**1,995,399,670**	**2,151,423,590**	**9%**
Emissions ($MTCO_2e$ per capita)				
Light duty vehicles	2.78	2.34	2.20	-21%
Heavy duty vehicles	0.74	0.66	0.84	14%
Total annual $MTCO_2e$ per capita	**3.51**	**3.00**	**3.04**	**-13%**

All absolute numbers are rounded to the nearest 10. Totals may not equal the sum of individual columns.

Nonresidential Electricity

Ontario's GHG emissions from nonresidential electricity, including commercial and industrial electricity use, decreased by 31 percent, from 375,540 $MTCO_2e$ in 2005 to 257,820 $MTCO_2e$ in 2019. In per capita terms, emissions from nonresidential electricity use decreased from 1.40 $MTCO_2e$ per capita in 2008 to 0.84 $MTCO_2e$ per capita in 2019, a decrease of 40 percent. Electricity use only decreased slightly during this period; however, the substantial decline in emissions is likely because of increased procurement of renewable energy by Ontario's energy providers, in accordance with state law, and increased energy efficiency of commercial and industrial facilities and equipment that largely balances out increased energy use from job growth. Table 6 provides a breakdown of the activity data and per capita GHG emissions for nonresidential electricity.

Table 6 Nonresidential Electricity Activity Data and Per Capita GHG Emissions, 2008 to 2019

Sector	2008	2016	2019	Percentage Change, 2008–2019
Activity data				
Nonresidential electricity (kWh)	1,273,004,280	1,275,792,750	1,242,306,720	-2%
Emissions ($MTCO_2e$ per capita)				
Nonresidential electricity	1.40	1.14	0.84	-40%

All absolute numbers are rounded to the nearest 10. Totals may not equal the sum of individual columns.

Residential Electricity

Ontario's GHG emissions from residential electricity decreased by 30 percent, from 93,680 $MTCO_2e$ in 2008 to 65,690 $MTCO_2e$ in 2019, although residential energy use declined less than 1 percent. In per capita terms, emissions from residential electricity use decreased from 0.35 $MTCO_2e$ per capita in 2008 to 0.21 $MTCO_2e$ per capita in 2019, a decrease of 39 percent. As with the nonresidential electricity sector, this is attributed to cleaner sources of electricity and gains in energy efficiency despite a growing residential population. **Table 7** provides a breakdown of the activity data and per capita GHG emissions for residential electricity.

Table 7 Residential Electricity Activity Data and Per Capita GHG Emissions, 2008 to 2019

Sector	2008	2016	2019	Percentage Change, 2008–2019
Activity data				
Residential electricity (kWh)	317,534,340	309,859,420	316,529,750	Less than -1%
Emissions ($MTCO_2e$ per capita)				
Residential electricity	0.35	0.28	0.21	-39%

All absolute numbers are rounded to the nearest 10. Totals may not equal the sum of individual columns.

Nonresidential Natural Gas

Emissions from the nonresidential natural gas sector decreased by 63 percent, from 368,460 $MTCO_2e$ in 2008 to 137,960 $MTCO_2e$ in 2019. In per capita terms, emissions from nonresidential natural gas use decreased from 1.37 $MTCO_2e$ per capita in 2008 to 0.45 $MTCO_2e$ per capita in 2019, a decrease of 67 percent. This dramatic decline in GHG emissions is attributed to decreased use and combustion of natural gas, reflected in the proportional decline in nonresidential natural gas activity between 2008 and 2019. **Table 8** provides a breakdown of the activity data and per capita GHG emissions for nonresidential natural gas.

Table 8 Nonresidential Natural Gas Activity Data and Per Capita GHG Emissions, 2008 to 2019

Subsector	2008	2016	2019	Percentage Change, 2008–2019
Activity data				
Nonresidential natural gas (therms)	65,367,180	21,861,030	26,168,160	-60%
Emissions ($MTCO_2e$ per capita)				
Nonresidential natural gas	1.37	0.66	0.45	-67%

All absolute numbers are rounded to the nearest 10. Totals may not equal the sum of individual columns.

Residential Natural Gas

Emissions from the residential natural gas sector decreased by 9 percent, from 98,620 $MTCO_2e$ in 2008 to 89,340 $MTCO_2e$ in 2019. In per capita terms, emissions from residential natural gas use decreased from 0.37 $MTCO_2e$ per capita in 2008 to 0.29 $MTCO_2e$ per capita in 2019, a decrease of 21 percent. Natural gas consumption in the residential sector remained fairly constant between 2008 and 2019. Table 9 provides a breakdown of the activity data and per capita GHG emissions for residential natural gas.

Table 9 Residential Natural Gas Activity Data and Per Capita GHG Emissions, 2008 to 2019

Sector	2008	2016	2019	Percentage Change, 2008–2019
Activity data				
Residential natural gas (therms)	16,911,770	14,595,200	16,945,380	Less than 1%
Emissions ($MTCO_2e$ per capita)				
Residential natural gas	0.37	0.28	0.29	-21%

All absolute numbers are rounded to the nearest 10. Totals may not equal the sum of individual columns.

Solid Waste

Ontario's GHG emissions associated with solid waste come from the decomposition of solid waste thrown away by community members and alternative daily cover (ADC, i.e., material applied at the landfill as pest and erosion control), and emissions associated with combustion of waste (transform tons). Emissions from the solid waste sector increased by 10 percent, from 75,930 $MTCO_2e$ to 83,400 $MTCO_2e$, between 2008 and 2019. In per capita terms, emissions from solid waste decreased from 0.28 $MTCO_2e$ per capita in 2008 to 0.27 $MTCO_2e$ per capita in 2019, a

decrease of 4 percent. Although Ontario community members generated more waste in 2019 than in 2008, the growing population helped offset this increase, resulting in a decrease in per capita emissions from the solid waste sector. **Table 10** provides a breakdown of activity and per capita emissions for the solid waste sector.

Table 10 Solid Waste Activity Data and Per Capita GHG Emissions by Subsector, 2008 to 2019

Sector	2008	2016	2019	Percentage Change, 2008–2019
Activity data (Tons)				
Solid waste	256,328	220,370	287,980	12%
ADC	-	-	2,670	-
Transform tons	-	-	1,030	-
Total activity (Tons)	**256,328**	**220,370**	**291,680**	**14%**
Emissions ($MTCO_2e$ per capita)				
Solid waste	0.283	0.220	0.268	-5%
ADC	-	-	0.002	-
Transform tons	-	-	0.001	-
Total annual per capita MTCO2e	**0.283**	**0.220**	**0.271**	**-4%**

All absolute numbers are rounded to the nearest 10. Totals may not equal the sum of individual columns.

Off-Road Equipment

Emissions from off-road equipment in Ontario increased by 41 percent, from 46,500 $MTCO_2e$ to 65,480 $MTCO_2e$ between 2008 and 2019. In per capita terms, emissions from off-road equipment increased from 0.173 $MTCO_2e$ per capita in 2008 to 0.213 $MTCO_2e$ per capita in 2019, an increase of 23 percent. Of the different types of off-road equipment, the three largest emissions sources are construction and mining equipment, portable equipment (compressors, generators, etc.), and industrial equipment such as forklifts and scrubbers. Increases in emissions from these sectors are at least partly due to an increase in construction and industrial/warehouse equipment use. Note that there is no activity data for this sector because emissions from off-road equipment are estimated from a model developed by CARB rather than from measurable metrics such as fuel consumption. **Table 11** provides off-road equipment per capita GHG emissions by subsector.

Table 11 Off-Road Equipment Per Capita GHG Emissions by Subsector, 2008 to 2019

Sector	2008	2016	2019	Percentage Change, 2008–2019
Emissions ($MTCO_2e$ per capita)				
Agricultural	0.00004	0.00339	0.00020	424%
Airport Ground Support	0.032	0.000	0.031	-1%
Construction and Mining	0.049	0.036	0.075	53%
Industrial	0.026	0.003	0.026	1%
Lawn and Garden	0.001	0.002	0.001	-8%
Light Commercial	0.008	0.003	0.008	1%
Pleasure Craft	0.001	0.022	0.001	31%
Portable Equipment	0.053	0.000	0.059	11%
Recreational	0.004	0.001	0.004	-1%
Transportation Refrigeration Units	0.001	0.006	0.009	1,113%
Total **annual per capita $MTCO_2e$**	**0.173**	**0.077**	**0.213**	**23%**

All absolute numbers are rounded to the nearest 10. Totals may not equal the sum of individual columns.

Agriculture

Ontario has a small agricultural sector that includes approximately 3,000 acres of land for crop production and a small dairy sector with approximately 11,000 head of dairy cows. The sector includes N_2O emissions from nitrogen fertilizer (crop production), CH_4 gas emissions from livestock (enteric fermentation), and CH4 emissions from livestock waste (manure management). The largest source of per capita GHG emissions in the agriculture sector is enteric fermentation, which was responsible for three-quarters of the total emissions for agriculture in 2019 (see **Table 12**).

Emissions from crop production decreased by 26 percent, from 1,150 $MTCO_2e$ to 850 $MTCO_2e$, between 2008 and 2019. In per capita terms, emissions from crop production decreased from 0.004 $MTCO_2e$ per capita in 2008 to 0.003 $MTCO_2e$ per capita in 2019, a decrease of 35 percent. Although crop acreages did not change significantly, less fertilizer was applied in 2019 than in 2008 due to a reduction in the types of crops that require high applications of nitrogen fertilizer. Per capita emissions from enteric fermentation and manure management (methane released from anaerobic decomposition of animal wastes) decreased by 75 percent and 76 percent, respectively, between 2008 and 2019. This dramatic decrease in emissions is the result of a substantial decline in the number of dairy cows in livestock operations within the city limits. According to the San Bernardino County Crop Reports and the USDA Milk Production Report, the number of dairy cows in Ontario decreased by 80 percent between 2008 and 2019.

Table 12 Agriculture Activity and Per Capita GHG Emissions by Subsector, 2008 to 2019

Sector	2008	2016	2019	Percentage Change, 2008–2019
Activity data				
Crops (acreage)	3,070	3,180	3,180	4%
Livestock (effective annual population)	53,240	18,900	10,890	-80%
Emissions ($MTCO_2e$ per capita)				
Crop production	0.004	0.003	0.003	-35%
Enteric fermentation	0.471	0.157	0.118	-75%
Manure management	0.158	0.051	0.037	-76%
Total annual per capita MTCO2e	**0.633**	**0.211**	**0.158**	**-75%**

All absolute numbers are rounded to the nearest 10. Totals may not equal the sum of individual columns.

Water and Wastewater

Emissions associated with the water and wastewater sector are counted as indirect or direct emissions. Indirect water emissions refer to emissions created by the electricity required to treat and move water to where it is used. Indirect wastewater emissions refer to electricity needed to move wastewater to water treatment facilities and to process and discharge it. Direct wastewater emissions refer to biological emissions produced directly by decomposition of wastewater solids during the treatment process.

Overall activity and emissions decreased in Ontario's water and wastewater sector. Emissions from this sector decreased by 49 percent between 2008 and 2019.

- Indirect water GHG emissions declined by 53 percent and indirect water consumption decreased by 40 percent between 2008 and 2019. In per capita terms, emissions from indirect water consumption decreased from 0.11 $MTCO_2e$ per capita in 2008 to 0.04 $MTCO_2e$ per capita in 2019, a decrease of 60 percent.
- Indirect wastewater GHG emissions decreased by 70 percent between 2008 and 2019. Emissions reductions in this sector were likely the result of increased water conservation and recycling efforts. In per capita terms, emissions from indirect wastewater decreased from 0.02 $MTCO_2e$ per capita in 2008 to 0.01 $MTCO_2e$ per capita in 2019, a decrease of 74 percent.

- Direct wastewater emissions increased by 7 percent from 2008 to 2019. In per capita terms, emissions from direct water consumption decreased from 0.15 $MTCO_2e$ per capita in 2008 to 0.06 $MTCO_2e$ per capita in 2019, a decrease of 6 percent.

The emissions data in **Table 13** provides a breakdown of the activity data and per capita GHG emissions for water and wastewater use.

Table 13 Water and Wastewater Activity Data and Per Capita GHG Emissions by Subsector, 2008 to 2019

Sector	2008	2016	2019	Percentage Change, 2008–2019
Activity data				
Water use (million gallons)	17,315	9,757	10,463	-40%
Water electricity use (kWh)	139,120,870	63,020,780	61,387,950	-56%
Wastewater electricity use (kWh)	9,735,890	6,806,891	7,672,160	-21%
Total activity (kWh)	**148,856,760**	**69,827,671**	**69,060,110**	**-54%**
Emissions ($MTCO_2e$ per capita)				
Indirect water	0.10828	0.04851	0.0436	-60%
Indirect wastewater	0.02457	0.01887	0.0064	-74%
Direct wastewater	0.01574	0.01517	0.0147	-6%
Total annual per capita $MTCO_2e$	0.1486	0.0826	0.0648	**-56%**

All absolute numbers are rounded to the nearest 10. Totals may not equal the sum of individual columns.

Land Use and Sequestration

GHG emissions from land use and sequestration can be positive (a source of emissions) or negative (removing emissions from the atmosphere, creating what is known as a carbon "sink"). Natural and agricultural lands absorb carbon, storing it in biomass such as wood, plants, and soil. As a result, when these lands are preserved or when more street trees are planted, emissions from this sector are negative because GHGs are being removed from the atmosphere. However, developing natural or agricultural lands or converting them to a different form (for example, replacing forests with crop land) or removing street trees causes carbon to be released, creating GHG emissions.

This sector includes emission sources and sinks from two types of activities: sequestration of GHG emissions in street trees in urbanized areas, and emissions caused by permanently removing vegetation from natural lands or farmlands as a part of development. Carbon sequestration by citywide street trees remained fairly constant between 2008 and 2019 (ranging from -710 $MTCO_2e$ to -730 $MTCO_2e$), offsetting some of the emissions caused by urban development. Between 2008

and 2019, emissions from the development of agricultural land decreased by 57 percent (from 2,540 $MTCO_2e$ to 660 $MTCO_2e$) due to a reduced rate of urban development during this period. In per capita terms, emissions from development of agricultural land decreased from 0.012 $MTCO_2e$ per capita in 2008 to 0.005 $MTCO_2e$ per capita in 2019, a decrease of 63 percent.

Most of the land developed between 2008 and 2019 was not land used for agricultural production and was categorized "Other Lands" by the Farmland Mapping and Monitoring Program (FMMP). According to FMMP, these lands include low density rural development, heavily forested land, mined land, or government land with restrictions on use. **Table 14** provides a breakdown of the land use change and street tree biomass acreage and per capita emissions.

Table 14 Land Use and Sequestration Activity Data and GHG Emissions by Subsector, 2008 to 2019

Sector	2008	2016	2019	Percentage Change, 2008–2019
Activity data (acres)				
Land use change (conversion of agricultural to urban land)	3,520	1,700	1,700	-52%
Street tree biomass	740	760	760	3%
Emissions ($MTCO_2e$ per capita)				
Land use change (conversion of agricultural to development)	0.012	0.005	0.005	-63%
Street tree biomass	-0.003	-0.003	-0.002	-10%
Total annual per capita $MTCO_2e$	**0.009**	**0.002**	**0.002**	**-77%**

Notes: All absolute numbers are rounded to the nearest 10. Totals may not equal the sum of individual columns. Methodology assumes that all agricultural land was converted into urban land uses and no street trees were removed on those urban lands.

Stationary Sources

Stationary source emissions result from fuel use, such as natural gas or propane, at major industrial facilities in the community permitted by state and regional air quality authorities. In Ontario, stationary sources include an industrial gas supplier, a paper and pulp mill, and Southern California Edison's Mira Loma Peaker power plant The natural gas use reported as part of these facilities' fuel use may be included in the nonresidential natural gas use reported above in **Table 8**. **Table 15** shows the emissions from stationary sources in Ontario. Per capita emissions from stationary sources decreased by 30 percent between 2008 and 2019. There is no activity data with this subsector, and these emissions are presented for informational purposes only; they are not included in the community total.

Table 15 Stationary Source GHG Emissions, 2008 to 2019

Sector	2008	2016	2019	Percentage Change, 2008–2019
Emissions ($MTCO_2e$ per capita)				
Stationary sources	1.50	0.25	1.05	-30%

Community-Wide Forecast

The community-wide forecast is a projection of future GHG emissions from the sources in Ontario's GHG inventory. The community-wide forecast of GHG emissions is based on the results of the 2019 community-wide GHG emissions inventory combined with Ontario's 2019 demographics and future demographic projections. These population, housing, and employment projections are based on the estimates of future buildout in TOP 2050. Table 16 shows the demographic projections used to prepare the community-wide GHG emissions forecast.

Table 16 City of Ontario Community-Wide Demographic Projection, 2019 to 2050

Metric	2019	2030	2050	Percentage Change 2019–2050	Relevant Sectors
Population	178,610	232,120	410,490	130%	Off-road equipment
Households	48,280	66,680	124,380	158%	Residential energy, off-road equipment
Residents per household	3.70	3.48	3.30	-11%	None
Jobs	128,640	169,600	296,000	130%	Nonresidential energy, off-road equipment
Service population	307,240	401,720	706,500	130%	Solid, water and wastewater, off-road equipment
Vehicle Miles Traveled (VMT)	2,151,423,590	2,631,468,770	3,504,276,490	63%	Transportation

Sources: 2019 demographic numbers are from US Census, the Department of Finance, and San Bernardino County Transportation Authority (SBCTA).
Future demographics are from TOP 2050 buildout projections. Vehicle miles traveled are derived from Fehr and Peers (2019).

Service population is the sum of populations and jobs. All numbers except residents per household are rounded to the nearest 10.

In addition to demographic and economic changes forecasted in TOP 2050, land use changes are expected to impact activity and emissions within the city limits. Although the city's total land area will not change, intensification of land uses in 2050 are listed as follows:

- All agricultural land is projected to be developed with urban uses by 2050, reducing emissions from the city's agricultural sector to zero emissions in 2050.
- Infill development in select areas will intensify commercial and mixed uses in Downtown, Toyota Arena, and Ontario Mills Mall.
- Select commercial and business park uses will be converted to mixed uses, which may contribute to reduced VMT.
- Residential development will intensify to promote higher density housing, especially in Ontario Ranch and southwest Ontario.
- Mixed use and higher density residential development is planned specifically to align with future bus rapid transit services along multiple north-south and east-west corridors throughout the city, which may contribute to reduced VMT.
- Land area dedicated to public open space will increase with the development of the Great Park, a 370-acre planned linear park stretching 3.5 miles from east to west in south Ontario.

This forecast is also referred to as the business-as-usual forecast. It assumes that, for most sectors, each person in Ontario will continue to contribute the same amount of GHG emissions to the community total as they did in 2019, so the amount of GHG emissions changes proportionally to the projected change in community demographics. However, some emissions, notably those from on-road transportation, grow at a slower rate due to the nature of the modeling process. The overall community-wide absolute emissions are projected to grow 89 percent from 2019 to 2050, and Ontario's service population is projected to grow 130 percent over this period. Since the rate of population increase is greater than the rate of GHG emission increase, the per-capita emissions decrease over time. This is a worst-case projection that assumes that no one at any level takes action, including state, regional, and local agencies. This projection also accounts for emission changes from land use and carbon sequestration. **Table 17** and **Figure 4** show Ontario's forecast community-wide GHG emissions through 2050.

Ontario's residential population and worker population are both projected to grow by 130 percent between 2019 and 2050. During the same period, the city's per capita emissions are expected to decrease from 5.54 $MTCO_2e$ to 4.56 $MTCO_2e$ per person in 2050, a decrease of 18 percent (see **Table 17**).

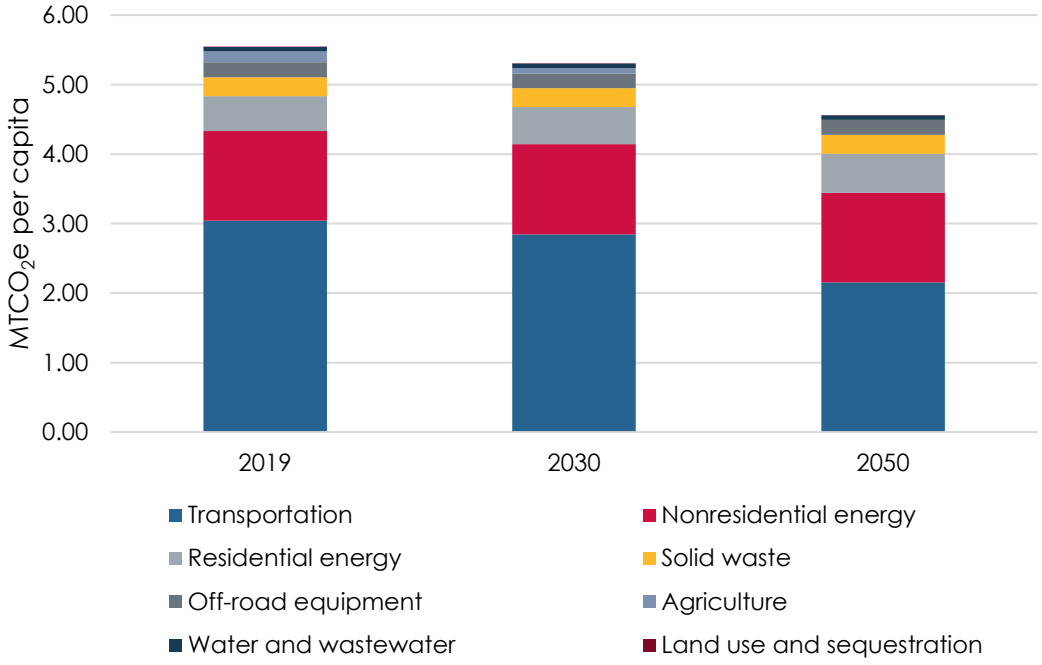
The forecast assumes emissions scale proportionally to demographic growth, which means most of the sectors grow at a similar rate to the growth in demographics, as seen by comparing the percentage changes in Table 17.

Table 17 Forecast Per Capita GHG Emissions, 2019–2050

Sector	2019[1]	2030	2050	Percentage Change, 2019–2050
Transportation	3.04	2.84	2.15	-29%
Nonresidential energy	1.29	1.30	1.29	Less than 1%
Residential energy	0.50	0.53	0.57	12%
Solid waste	0.27	0.27	0.27	Less than 1%
Off-road equipment	0.21	0.21	0.21	Less than 1%
Agriculture[2]	0.16	0.08	0.00	-100%
Water and wastewater	0.06	0.06	0.06	Less than 1%
Land use and sequestration	Less than 0.01	Less than 0.01	Less than 0.01	-15%
Total	**5.54**	**5.30**	**4.56**	**-18%**
Stationary Sources[3]	*1.05*	-	-	-

1. Data shown for 2019 are the actual per capita GHG emissions. The data shown for 2030, 2040, and 2050 are GHG per capita emission forecasts, calculated based on projections from the 2019 inventory.
2. GHG emission projects for the agriculture are based on the assumption that by 2050 all agricultural land will be developed and converted to other land uses, so agricultural emissions will decrease to zero by 2050.
3. Stationary sources are informational; they vary significantly from year to year independent of demographic changes, so they are not forecast.

Figure 4 City of Ontario Community-Wide Per Capita GHG Emissions, 2019–2050



4. GHG REDUCTION TARGETS

Background

Establishing GHG emission reduction targets is a key component of the CCAP to ensure that Ontario has a number to strive toward as it implements GHG reduction strategies. The strategies and actions adopted as part of the CCAP are often quantifiable to ensure that each action the City takes can be measured for its performance in advancing Ontario to the adopted GHG emission reduction goal. Jurisdictions can choose to adopt GHG emission reduction targets that match state guidance or can elect to increase reduction targets to accelerate action at a local level.

2014 CCAP GHG Reduction Targets

As part of the 2014 CCAP, the City adopted a GHG reduction target of 30 percent below the forecast emissions levels in 2020. This target is approximately equal to the state-recommended reduction target of 15 percent below 2005 – 2008 levels by 2020.

In 2019, Ontario reached its 2020 GHG reduction target of 15 percent below 2008 levels, which translates to absolute GHG emissions of 1,880,970 $MTCO_2e$ or 7.01 $MTCO_2e$ per capita. According to the 2019 GHG inventory conducted as part of the 2022 CCAP update, Ontario's community-wide emissions in 2019 were 1,707,380 $MTCO_2e$ (not including the informational emissions from stationary sources), 23 percent below 2008 levels (as adjusted to be consistent with current protocols as part of this CCAP update). In per capita terms, Ontario's emissions in 2019 were 5.54 $MTCO_2e$, a 33 percent decrease relative to 2008 levels.

State Targets and Recommendations

As stated in "Regulatory Framework" in Chapter 2, the state has set GHG reduction targets to:

- Reduce 2030 emissions 40 percent below 1990 levels, codified into law by SB 32 in 2016.
- Achieve carbon-neutral emissions by 2045, established (and not yet codified into law) by EO B-55-18.
- Reduce 2050 emissions 80 percent below 1990 levels, established (and not yet codified into law) by EOS-03-05.

The Scoping Plan, also described in "Regulatory Framework" in Chapter 2, recommends that local governments select targets consistent with state targets, in absolute or per-capita form. Per-capita targets establish a level of GHG emissions by a certain year per person. Unlike absolute targets, the total level of GHG emission reductions specified by per-capita targets varies depending on future demographic changes. The Scoping Plan recommends the following per-capita targets:

- Reduce 2030 emissions to 6.0 $MTCO_2e$ per capita
- Reduce 2050 emissions to 2.0 $MTCO_2e$ per capita

These targets are based on the state targets and goals in SB 32 and Executive Order S-03-05, discussed previously. California's statewide target of 40 percent below 1990 levels by 2030 translates to 260 million $MTCO_2e$. The state is projected to be home to approximately 44 million residents in 2030, resulting in an average of approximately 6.0 $MTCO_2e$ per person. Similarly, the statewide goal of 80 percent below 1990 levels by 2050 translates to 86 million $MTCO_2e$. California is projected to have approximately 49 million residents in 2050, resulting in an average of approximately 2.0 $MTCO_2e$ per person.

Since the statewide per-capita targets are based on the statewide GHG emissions inventory that includes all emissions sectors in the state, the Scoping Plan notes that it is appropriate for local jurisdictions to derive evidence-based local per-capita targets based on local emissions sectors and population projections that are consistent with the framework used to develop the statewide per-capita targets. The resulting GHG emissions trajectory should show a downward trend consistent with the statewide objectives.

2022 CCAP GHG Reduction Targets

The state-recommended per-capita targets (6.0 $MTCO_2e$ per person by 2030 and 2.0 $MTCO_2e$ per person by 2050) are relevant and appropriate for Ontario, and they are the targets in this 2022 CCAP. Ontario's targets are based on the service population in the community (the sum of both residents and jobs), as shown in **Table 18**.

Table 18 Per Capita Targets for Ontario

Absolute Emissions Target			Per Capita Emissions Target
Target	$MTCO_2e$	Description	$MTCO_2e$
2030 target	1,175,390	40% below 1990 levels	6.0 $MTCO_2e$ per person (service population)
2050 target	391,800	80% below 1990 levels	2.0 $MTCO_2e$ per person (service population)

5. GREENHOUSE GAS EMISSION REDUCTION STRATEGY

Introduction

There are several ways in which GHG emissions can be reduced over time. States, counties, cities, regional agencies, nonprofit organizations, businesses, and each individual can work together or separately to run projects and programs that either reduce GHG emissions before they are released or sequester carbon once it is in the atmosphere. This chapter describes Ontario's path to reducing GHG emissions to meet or exceed its targets, including existing/planned efforts led by state, regional, and local agencies, and new strategies in this 2022 CCAP.

Calculating Credit

This 2022 CCAP uses a process called quantification to determine how much GHG emissions are reduced by each strategy. The foundation for the quantification calculations is the baseline GHG inventories and forecast. Activity data from the inventory, such as VMT or kWh, are combined with participation rates and data about the reduction in activity data from each action to calculate the GHG reduction benefit of each strategy. This approach ensures that the GHG reductions from the 2022 CCAP strategies are tied to current and future activities that are occurring in the community.

Calculations for reduction in activity data come from tools and reports provided by government agencies; these agencies include the U. S. EPA, the California Energy Commission, CARB, the California Air Pollution Control Officers Association, the U.S. Department of Energy (DOE), and local air districts. If accurate data are not available from these sources, the quantification uses case studies from comparable communities and applicable scholarly research.

The project team was able to quantify GHG reductions for most of the strategies in this 2022 CCAP. However, there are a few that do not have a specific reduction level due to missing data or the lack of a reliable method. These efforts are still expected to reduce GHG emissions, but the level cannot be accurately determined. These strategies are labeled "supportive".

Progress Toward GHG Reduction Goals

To understand the level of action necessary to achieve the City's reduction targets, this 2022 CCAP analyzes existing, planned, and future actions. By first looking at past accomplishments, the City can understand progress achieved and outstanding opportunities while looking at state initiatives, which may result in further GHG reductions on a local level. Existing and current efforts provide a

foundation for this 2022 CCAP. The GHG reductions from past and current activities help inform the creation of new GHG reduction strategies to reduce GHG emissions even further. These new strategies can further close the gap between projected GHG emission levels and the reduction targets, and guide development and implementation of future programs. Together, these efforts serve as the City's multipronged strategy to achieve reduction targets.

State Initiatives to Reduce GHG Emissions

Since passing AB 32, the State has enacted regulations and programs to reduce GHG emissions. Although statewide in scope, these actions affect several sources of Ontario's emissions, so the local benefits of these State efforts can be "credited" to Ontario even in cases where the community did not need to take any action. This CCAP includes the local benefits from five State policies:

- **Renewable Portfolio Standard:** The RPS was first established in 2002 and has been amended multiple times, most recently in 2018 by SB 100. It requires all electricity providers in the state to obtain at least 33 percent of their electricity from eligible renewable resources by the end of 2030, and all their electricity from carbon-free (although not necessarily eligible renewable) resources by the end of 2045. This policy reduces GHG emission from electricity use, including electricity used to transport and process water and wastewater, and electricity used for electric vehicles.

- **Clean Car Standards:** In 2002, California adopted AB 1493, the New Passenger Motor Vehicle Greenhouse Gas Emission Standards, or Pavley standard. It required a reduction in tailpipe GHG emissions from new vehicles produced from 2009 to 2015. In 2012 CARB adopted an extension of this policy, the Advanced Clean Car Standards, which requires more stringent reductions in tailpipe GHG emissions from vehicles produced from 2016 to 2025. The Clean Car Standards (including the Advanced Clean Car Standards) reduce GHG emissions from on-road transportation vehicles, including commercial and public transit vehicles.

- **Title 24 Energy Efficiency Standards:** California Code of Regulations, Title 24, Part 6 is California's energy efficiency standards for new and renovated buildings, applied at the local level through the project review/building permit process. The standards are strengthened every three years. The most recent set of Title 24 standards went into effect on January 1, 2020, although the reductions shown from this policy include past, current, and anticipated future Title 24 standards. This policy will reduce GHG emissions from electricity and natural gas use in new and substantially renovated homes and nonresidential buildings.

- **Local Carbon Fuel Standard:** The Low Carbon Fuel Standard (LCFS) was adopted in 2009 and required a 10 percent reduction in the carbon intensity of all transportation and equipment fuels by 2020. This policy reduces GHG emissions from on-road transportation and from off-road equipment.
- **The short-lived climate pollutants law (SB 1383)**: SB 1383, approved in 2016, proposes a comprehensive strategy to reduce methane and other emissions of short-lived greenhouse gases through regulations on dairy operations and urban landfills, including higher diversion rates of food waste from landfills.

Renewable Energy Emissions Reductions in 2050

As required by the state's Renewables Portfolio Standard, all electricity sold in California must be carbon free by 2045. Consequently, future GHG reduction strategies that only reduce electricity use or increase renewable electricity supplies will show zero GHG reductions in 2050. Since there will already be no emissions from electricity use in 2050, the City cannot count additional reductions associated with electricity in that year. This 2022 CCAP already credits reductions from the RPS as an existing state program.

Under the business-as-usual forecast in **Table 17**, per capita GHG emissions in Ontario decrease by 18 percent between 2019 and 2050. However, when state actions are accounted for, per capita GHG emissions decrease by 57 percent between 2019 to 2050. **Table 19** shows the per capita GHG emissions reductions resulting from state actions.

Table 19 Ontario Per Capita GHG Emission Reductions from State Actions, 2019 to 2050

Sector	2019 $MTCO_2e$	2030 $MTCO_2e$	2050 $MTCO_2e$	Percentage Change 2019–2050
Per capita emissions without state actions	5.54	5.30	4.56	-18%
Per capita emissions reductions from RPS		0.21	1.13	-
Per capita emissions reductions from Clean Car standards		0.53	0.69	-
Per capita emissions reductions from Title 24		0.19	0.28	-
Per capita emissions reductions from LCFS (off-road equipment emissions)		0.01	0.01	-
Per capita emissions from SB 1383		0.06	0.06	-
Per capita emission reductions from all state actions		**1.00**	**2.17**	**-**
Per capita emissions with state actions	**5.54**	**4.31**	**2.39**	**-57%**

Existing Local Actions to Reduce GHG Emissions

Regional and local initiatives help to further reduce Ontario's community-wide GHG emissions.

There are various local efforts that are expected to reduce GHG emissions, including:

- Smart Ontario, an initiative to promote energy efficiency through comprehensive municipal utility infrastructure improvements.
- Municipal and residential rooftop solar installations.
- Implementation of the Active Transportation Master Plan and synchronization of traffic lights through the City's Traffic Management Center.
- Use of recycled water from Inland Empire Utilities Agency (IEUA) for irrigation, industrial uses, and agricultural uses.

As with the state-level policies, the 2022 CCAP assesses the strategies that have the most direct and apparent benefit to Ontario's GHG emissions. The City and local partners have also completed other efforts, which are not listed here, that may not directly reduce GHG emissions in a measurable way but still contribute to progress on overall climate action.

New GHG Reduction Strategies

A central goal of the 2022 CCAP is to achieve additional GHG reductions to work toward Ontario's 2030 and 2050 reduction targets, recognizing that the reduction strategies in the 2014 CCAP are insufficient to meet these reductions. To identify these additional reductions, the 2021 CCAP project team began with the GHG reduction strategies in the City's 2014 CCAP. Some of these strategies have been fully implemented and do not need to be carried forward into the 2022 CCAP. Others are still applicable and can be revised or expanded to achieve additional GHG reductions. There are also opportunities to add entirely new strategies to address new and emerging issues not covered in the 2014 CCAP.

The project team based the revised and new GHG reduction strategies on several sources, including:

- Past and recent GHG inventories and forecast.
- The existing and planned state, regional, and local accomplishments.
- GHG reduction strategies in the 2014 CCAP.
- GHG reduction strategies in the San Bernardino Regional GHG Reduction Plan.

The project team developed 28 GHG reduction strategies and 106 recommended implementation actions. These strategies include a mix of education and outreach programs to encourage GHG reduction activities, financial subsidies, and other enticements to incentivize GHG reductions, and mandates to require GHG efforts. These 28 strategies are organized into 10 categories:

1. Energy
2. Transportation
3. Off-road
4. Waste
5. Water
6. Agriculture
7. Wastewater
8. Leadership
9. Carbon Sequestration
10. Economic Development

The results of quantifying GHG reduction potential of Ontario's existing and planned local strategies show that, with successful implementation of the strategies, Ontario can meet its 2030 and 2050 emissions per capita reduction targets. Collectively, local strategies are forecast to reduce emissions by 0.54 $MTCO_2e$ per capita by 2030 and 1.08 $MTCO_2e$ per capita by 2050 in addition to the reductions achieved by existing State, regional, and local accomplishments.

Each strategy entry includes a description, the anticipated 2030 and 2050 GHG reductions achieved by the strategy at the projected performance level, and the recommended actions necessary to implement it. For each strategy, more details on performance metrics, assumptions, and quantification methods are provided in Technical Appendix A. Recommended actions represent the City's current understanding of best practices in achieving GHG emissions reductions and community equity, availability of technology, and local regulations as well as the current State and federal regulatory environment. City staff are encouraged to revisit these recommended actions as conditions change and new opportunities become available.

Energy

Most buildings, both residential and nonresidential, use electricity and natural gas to operate appliances and other pieces of equipment. While sources of electricity have become much cleaner over time and will continue to become cleaner due to State law and utility policies, the GHG emissions associated with using a unit of natural gas have remained mostly constant because natural gas is a fossil fuel. Buildings that receive most or all their energy from electricity instead of natural gas can significantly reduce their GHG emissions. Buildings can be constructed to be mostly electric or all electric, or existing buildings can be electrified as part of retrofit activities.

Retrofits can improve energy efficiency of the building envelope, especially in older buildings. And advances in electric appliances, such as those used for space heating, water heating, and cooking, have helped improve energy efficiency and make electrification more cost effective.

When a building has optimized energy efficiency and maximized energy conservation, it is a good candidate for onsite renewable energy. Most residential buildings are candidates for rooftop solar or a rooftop photovoltaic system, which includes electricity-generating solar panels mounted on the rooftop of a residential or commercial building or structure. Larger properties or more energy intensive uses can use ground-mounted solar energy systems or a combination of renewable energy technologies to meet all or part of their energy demand.

ONTARIO SHINES PROGRAM

Ontario Shines is a project of Ontario Together whose goal is to install solar panels on up to 100 single-family homes and include solar installations at various multifamily housing sites, including the all-electric, LEED gold standard development, Vista Verde Apartments. As of March 2022, the project team, in collaboration with nonprofit partner GRID Alternatives, has successfully installed 130 kW of solar arrays at single family homes and 250 kW of solar arrays at multifamily homes as part of the Ontario Shines program.

Building electrification

Promote and incentivize the phase-out of gas appliances in new and existing homes and businesses throughout the community to advance GHG reductions, increase energy efficiency, and protect public safety and environmental health.

Strategy 1 GHG Reduction Potential	2030	2050
Absolute GHG Reduction ($MTCO_2e$)	10,310	102,640
Per capita GHG Reduction ($MTCO_2e$ per capita)	0.0257	0.1453

STRATEGY 1 ACTIONS:

- Support education and outreach to raise awareness and increase participation in electric appliance rebate programs offered by SCE, Southern California Regional Energy Network (SoCalREN), and other providers, with a focus on contractors and residents of older properties (constructed in or before 1975).
- Identify and remove any existing code, permitting, or other City requirements that provide barriers to all-electric conversions of existing homes and businesses and assess opportunities to provide incentives, such as permit streamlining or fee reductions, as feasible.
- Update the City's permit tracking system as appropriate to track energy efficiency improvements.
- Review City-supported weatherization and energy efficiency programs and requirements, if applicable, to ensure they support all-electric, high efficiency appliances.
- Support education opportunities for contractors about the opportunities and benefits of converting homes to high efficiency, all-electric appliances.
- Audit existing City facilities on a regular basis to assess energy use and efficiency, identify energy efficiency improvements that optimize energy performance of buildings and operations, and prioritize energy efficiency improvements.

STRATEGY 2 ONSITE SOLAR ENERGY FOR EXISTING RESIDENTIAL DEVELOPMENT

Continue to support and facilitate installation of rooftop solar photovoltaic and onsite solar energy systems in existing residential development.

Strategy 2 GHG Reduction Potential	2030	2050
Absolute GHG Reduction ($MTCO_2e$)	2,040	0
Per capita GHG Reduction ($MTCO_2e$ per capita)	0.0051	0

STRATEGY 2 ACTIONS:

- Conduct outreach to raise awareness about the benefits of solar energy for homes and increase installations of residential solar photovoltaic (PV) systems in Ontario.
- Establish a solar permitting web page on the City's website that summarizes requirements for installing solar PV systems to ensure the information is easily accessible to the public.
- Update City permit tracking as appropriate to track size and number of renewable energy installations.

STRATEGY 3 ONSITE SOLAR ENERGY SYSTEMS FOR NONRESIDENTIAL DEVELOPMENT

Ensure new large nonresidential development, including City facilities, includes onsite renewable energy to support the site's energy needs by requiring solar photovoltaic panels or other appropriate onsite renewable energy generation systems for the following types of projects:

- New commercial and office buildings, or existing commercial and office building expansions greater or equal to 45,000 square feet in size.
- New industrial or existing industrial buildings expansions greater or equal to 100,000 square feet in size.

Strategy 3 GHG Reduction Potential	2030	2050
Absolute GHG Reduction ($MTCO_2e$)	26,480	0
Per capita GHG Reduction ($MTCO_2e$ per capita)	0.0659	0

STRATEGY 3 ACTIONS:

- Provide and support incentives and rebates for solar PV systems for industrial uses to encourage increased local use of renewable energy.

- Conduct outreach to raise awareness about the benefits of solar energy for businesses, including industrial facilities, and increase installations of nonresidential solar PV systems in Ontario.
- Assess the feasibility of placing solar on City-owned properties.

STRATEGY 4 GREEN ROOFS

Promote and incentivize residents and business owners to install green roofs to conserve energy and reduce surface water runoff.

Strategy 4 GHG Reduction Potential	2030	2050
Absolute GHG Reduction ($MTCO_2e$)	Less than 10	Less than 10
Per capita GHG Reduction ($MTCO_2e$ per capita)	Less than 10	Less than 10

STRATEGY 4 ACTIONS:

- Provide and support incentives for installation of green roofs in new and existing buildings.
- Conduct outreach to raise awareness about and increase participation in green roof rebate program.

STRATEGY 5 URBAN COOLING

Maintain and expand the City's existing tree canopy, with a goal of planting 500 trees annually through 2050 and promote the use of pervious concrete and cool pavement for pavement projects.

Strategy 5 GHG Reduction Potential	2030	2050
Absolute GHG Reduction ($MTCO_2e$)	5,610	12,730
Per capita GHG Reduction ($MTCO_2e$ per capita)	0.0140	0.0180

STRATEGY 5 ACTIONS:

- Maintain and expand an urban forestry program to manage citywide tree planting, track citywide tree inventory and canopy cover, and monitor tree health to maintain and expand the City's existing tree canopy.
- Identify priority areas for tree planting, focusing on environmental justice communities, to mitigate the heat island effect in underserved neighborhoods.
- Ensure that new and retrofitted large hardscaped areas, such as parking lots, incorporate trees and other green infrastructure appropriate for current and future climate conditions.
- Explore grant funding opportunities for urban forestry, pervious concrete, and cool pavement.

STRATEGY 6 ENERGY EFFICIENCY RETROFITS FOR LOW-INCOME HOUSEHOLDS

Promote and incentivize voluntary energy efficiency retrofits of homes to reduce natural gas and electricity usage, with the goal of retrofitting 9,000 low-income homes by 2050. Partner with community services agencies to fund energy efficiency projects, including heating, ventilation, air conditioning, indoor lighting, water heating equipment, insulation, and weatherization for low-income residents.

Strategy 6 GHG Reduction Potential	2030	2050
Absolute GHG Reduction ($MTCO_2e$)	940	1,440
Per capita GHG Reduction ($MTCO_2e$ per capita)	0.0023	0.0020

STRATEGY 6 ACTIONS:

- Assist San Bernardino County staff and other partners with their targeted outreach campaigns, including hosting workshops and promoting programs through City communication channels to increase awareness of the benefits of weatherization among low-income households.
- Expand and better integrate funding and support for existing programs that support weatherization and increase energy efficiency in low-income households, including through partnerships with SoCalREN and San Bernardino County.
- Engage with tenants and owners of multifamily homes and promote the SoCalREN multifamily program.

STRATEGY 7 ENERGY EFFICIENCY RETROFITS

Promote and incentivize voluntary energy efficiency retrofits to reduce in natural gas and electricity usage. Partner with regional agencies to expand access to existing energy efficiency and conservation opportunities, incentives, and technical assistance for residents and businesses.

Strategy 7 GHG Reduction Potential	2030	2050
Absolute GHG Reduction ($MTCO_2e$)	11,570	15,600
Per capita GHG Reduction ($MTCO_2e$ per capita)	0.0288	0.0221

STRATEGY 7 ACTIONS:

- Assist partners with their outreach campaigns by hosting workshops, promoting programs through City communication channels, promoting programs through interactions with homeowners and contractors, and sharing permitting data to inform targeted outreach.

- Establish a web page on the City's website that summarizes permitting requirements, available rebates, and other information about energy efficiency retrofits to ensure that information is easily available to the public.
- Support SoCalREN and San Bernardino County efforts to conduct outreach and education with local contractors to ensure they are updated on local code requirements and energy-efficient appliances and devices.
- Encourage owners of existing commercial, industrial, and residential buildings 10,000 square feet or larger to prepare an annual energy and water benchmarking report and submit it to the City, to help community awareness of building performance and identify opportunities for energy- and water-efficiency retrofits.

NONRESIDENTIAL NATURAL GAS SAVINGS

Between 2008 and 2019, the City substantially reduced its GHG emissions from the nonresidential natural gas sector. Emissions from the nonresidential natural gas sector decreased by 63 percent, from 368,460 $MTCO_2e$ in 2008 to 137,960 $MTCO_2e$ in 2019.

- If Ontario is not on track to meet GHG reduction targets by 2025, develop and implement additional energy efficiency standards for existing buildings.
- Research, consider, and implement an incentive program to encourage community members to reduce energy consumption.

Transportation

The private automobile has long dominated Ontario's transportation landscape. While convenient, private vehicle travel releases significant volumes of GHGs, emits air pollutants, degrades roads, and poses safety concerns for the community. Allowing for affordable, accessible, and reliable transportation options available to the Ontario community makes it easier for all residents to participate in public life and gives all community members the freedom to choose transportation modes that promote health, reduce fuel costs and time lost in traffic, and help the City meet its climate action goals. This 2022 CCAP aims to provide viable alternatives to single-occupancy vehicle trips by promoting alternative modes of transportation through high-frequency bus service and expansion of bicycle and pedestrian facilities, especially near schools, business districts, and employment centers. In addition, this CCAP aims to reduce the emissions released by passenger vehicles by promoting electric vehicle adoption through municipal fleet electrification, community-wide EV charging stations, and rebates for EV purchases.

STRATEGY 8 SMART GROWTH AND INFILL

Encourage revitalization of neighborhoods through higher-density, mixed-use, infill development and creative reuse of under-utilized sites within the urban core. This measure is supportive of community-wide GHG reduction goals and does not have directly measurable GHG reductions.

Strategy 8 GHG Reduction Potential	2030	2050
Absolute GHG Reduction ($MTCO_2e$)	None (supportive)	None (supportive)
Per capita GHG Reduction ($MTCO_2e$ per capita)	None (supportive)	None (supportive)

STRATEGY 8 ACTIONS:

- Identify opportunities to increase residential density in and around the urban core.
- Examine the development review process and other zoning approval processes to reduce or eliminate regulations that increase costs for higher density development.
- Regularly identify underutilized parcels in existing infill areas to support increased housing and business opportunities consistent with the adopted Housing Element.

STRATEGY 9 TRANSIT-ORIENTED DEVELOPMENT

Encourage development of compact, mixed-use, and transit-oriented development to improve the regional jobs-housing balance, especially on corridors served by high-ridership transit and bus rapid transit (BRT), such as Holt Avenue.

Strategy 9 GHG Reduction Potential	2030	2050
Absolute GHG Reduction ($MTCO_2e$)	330	1,440
Per capita GHG Reduction ($MTCO_2e$ per capita)	0.0008	0.0020

STRATEGY 9 ACTIONS:

- Require that development within the transit-oriented development (TOD) corridor maintains and improves the mobility of people and vehicles along and across the corridor through safety considerations such as separated sidewalks and bike lanes or traffic-calming measures.
- Require development within the TOD corridor to protect and improve as needed transportation infrastructure, equitably considering the safety, comfort, and effectiveness of all transportation modes.

- Establish and maintain land use patterns in the TOD corridor that will attract and serve riders of public transit, such as higher-density mixed-use buildings near existing high-frequency transit stops.
- Revise land use and development standards in the TOD corridor as needed to remove any barriers to appropriate higher-density development.

STRATEGY 10 INCREASE TRANSPORTATION RIDERSHIP

Ensure a reliable and responsive transit system with dedicated and secure funding and resources to support increased ridership.

Strategy 10 GHG Reduction Potential	2030	2050
Absolute GHG Reduction ($MTCO_2e$)	27,980	31,450
Per capita GHG Reduction ($MTCO_2e$ per capita)	0.0697	0.0445

STRATEGY 10 ACTIONS:

- Collaborate with LA Metro, Metrolink, and Omnitrans to implement "Smart Bus" technology, global positioning systems (GPS), and electronic displays at all transit stops to provide customers with "real-time" arrival and departure time information.
- Support efforts to establish dedicated bus lanes.
- Collaborate with regional transit operators on programs to increase use of the City's public transportation system. To the extent feasible, support shorter transit passenger travel time through reduced headways and increased speed. Support efforts by regional transit operators to reduce the average fleet travel time by 5 minutes.
- In collaboration with transit agencies, support new transit routes, increased transit frequency and operating hours, and other improvements to transit quality.
- Support citywide outreach campaigns by transit agencies to promote the use of public transit, including fare-free days to encourage mode shifts.
- Coordinate with large regional employers to establish a shuttle service that connects transit centers to employment centers during commuting hours.
- Encourage employers to offer ridership programs, public transit passes, and telecommuting to employees.

STRATEGY 11 TRAFFIC SIGNAL SYNCHRONIZATION AND ROADWAY MANAGEMENT

Implement traffic and roadway management strategies to improve mobility and efficiency and reduce associated emissions. This measure is supportive of community-wide GHG reduction goals and does not have directly measurable GHG reductions.

Strategy 11 GHG Reduction Potential	2030	2050
Absolute GHG Reduction ($MTCO_2e$)	None (supportive)	None (supportive)
Per capita GHG Reduction ($MTCO_2e$ per capita)	None (supportive)	None (supportive)

STRATEGY 11 ACTIONS:

- Work with the Traffic Management Center to develop an annual signal synchronization program for identified priority corridors to understand changing traffic conditions, including peak hour conditions and traffic congestion patterns; update signal timing to match the specific needs of study corridors; and report on progress in travel time, average speed, and delay to measure effectiveness of the signal synchronization project.
- Work with the Traffic Management Center to ensure that signal timing is updated on a regular basis to comply with latest State requirements and accommodate pedestrian and bicycle crossing time for roadways with crosswalks and/or bicycle facilities.

STRATEGY 12 COMMUNITY VEHICLE ELECTRIFICATION

Promote and incentivize the adoption of electric vehicles (EV) citywide, including light-duty and heavy-duty vehicles, for municipal, commercial, and residential uses.

Strategy 12 GHG Reduction Potential	2030	2050
Absolute GHG Reduction ($MTCO_2e$)	62,880	465,140
Per capita GHG Reduction ($MTCO_2e$ per capita)	0.1565	0.6584

STRATEGY 12 ACTIONS:

- Develop and implement a plan to transition the City's municipal fleet to low-and zero-emission vehicles, to the greatest extent feasible.
- Collaborate with Omnitrans to encourage investment in electric buses.
- Encourage the use of electric vehicles by increasing access to availability of public EV charging stations.

- Work with SCAQMD to participate in CARB's Proposition 1B–Goods Movement Emission Reduction Program to incentivize investment in cleaner trucks and electrification infrastructure to reduce air pollution emissions from freight activity beyond enforceable requirements.
- Incentivize the purchase of electric vehicles by providing EV rebates for Ontario residents and/or facilitating awareness rebates available from public agencies.
- Provide information about EV rebate programs and other incentives through multiple communication channels to raise awareness about and increase purchases of EVs among residents and business owners, including creating a dedicated web page on the City website with information about purchasing EVs and installing EV chargers.

STRATEGY 13 ACTIVE TRANSPORTATION NETWORKS

Work with transit agencies, school districts, and employers to facilitate an interconnected transportation system that allows a shift in travel from private passenger vehicles to alternative modes, including public transit, ride sharing, car sharing, bicycling, and walking.

Strategy 13 GHG Reduction Potential	2030	2050
Absolute GHG Reduction ($MTCO_2e$)	1,800	3,840
Per capita GHG Reduction ($MTCO_2e$ per capita)	0.0045	0.0054

STRATEGY 13 ACTIONS:

- Encourage local school districts to develop school transit plans to substantially reduce automobile trips to and congestion surrounding schools.
- Increase pedestrian and bicycle facilities through implementation of the Active Transportation Master Plan, expanding the active transportation network to include 186.7 miles of bicycle facilities and pedestrian safety improvements to promote higher bicycle ridership and walking rates.
- Seek funding for active transportation infrastructure improvements.
- Implement scooter-share pilot program in Ontario Ranch in 2023.

STRATEGY 14 VEHICLE IDLING

Limit idling of heavy-duty trucks. Support the SCAMQD and CARB anti-idling requirements and provide signage in key areas where idling that is not consistent with SCAMQD or CARB requirements might occur.

Strategy 14 GHG Reduction Potential	2030	2050
Absolute GHG Reduction ($MTCO_2e$)	1,950	1,780
Per capita GHG Reduction ($MTCO_2e$ per capita)	0.0049	0.0025

STRATEGY 14 ACTIONS:

- Evaluate the feasibility of an idling ordinance that reduces the legally allowed idling time for heavy duty trucks (greater than 26,000 gross vehicle weight) to 3 minutes. California law currently limits idling time to 5 minutes. Ordinance must include a violation fee and enforcement mechanisms.
- Create a public awareness campaign to raise awareness about and increase compliance with idling ordinance.
- Install signage regarding new idling limit of 3 minutes in areas designated for industrial uses.

STRATEGY 15 PARKING POLICY AND EVENT PARKING

Adopt a comprehensive parking policy that encourages carpooling and the use of alternative transportation, including providing parking spaces for car-share vehicles at convenient locations accessible by public transportation.

Strategy 15 GHG Reduction Potential	2030	2050
Absolute GHG Reduction ($MTCO_2e$)	2,230	8,110
Per capita GHG Reduction ($MTCO_2e$ per capita)	0.0056	0.0115

STRATEGY 15 ACTIONS:

- Establish a market pricing scheme for on-street parking in Downtown Ontario.
- Designate at least 5 percent of downtown parking spaces as loading and unloading areas for taxis, ridesharing or Transportation Network Companies, buses, and shuttles.
- Designate a portion of parking revenues that can support City-led GHG reduction projects.
- Consider establishing policies and programs to reduce onsite parking demand and promote ride-sharing during events at the Ontario Convention Center and other event venues.

Off-Road

Off-road equipment is used in many important sectors of the Ontario economy, such as construction, landscaping, warehousing and logistics, and others. The use of off-road equipment contributes to community-wide GHG emissions, air pollution, and noise-levels in Ontario. Construction equipment is also a significant source of air pollution in the heavy-duty off-road equipment sector.[25] By encouraging the transition to electric off-road equipment, Ontario can improve quality of life and reduce air pollution while reducing GHG emissions.

STRATEGY 16 ELECTRIFICATION OF CONSTRUCTION AND LANDSCAPING EQUIPMENT

Promote and incentivize the transition to electric construction and landscaping equipment.

Strategy 16 GHG Reduction Potential	2030	2050
Absolute GHG Reduction ($MTCO_2e$)	4,810	26,020
Per capita GHG Reduction ($MTCO_2e$ per capita)	0.0120	0.0368

STRATEGY 16 ACTIONS:

- Support state and regional efforts to replace diesel-powered construction and landscaping equipment with electric equipment.
- Conduct targeted outreach to local construction and landscaping companies to raise awareness about and increase participation in available electric equipment rebate programs.

STRATEGY 17 IDLING ORDINANCE FOR CONSTRUCTION EQUIPMENT

Limit idling of heavy-duty off-road construction equipment to reduce air pollution and GHG emissions from construction activity.

Strategy 17 GHG Reduction Potential	2030	2050
Absolute GHG Reduction ($MTCO_2e$)	40	100
Per capita GHG Reduction ($MTCO_2e$ per capita)	0.0001	0.0001

STRATEGY 17 ACTIONS:

- Evaluate the feasibility of an equipment idling ordinance that reduces the legally allowed idling time for heavy duty construction equipment to 3 minutes. Ordinance must include a violation fee and enforcement mechanisms.
- Conduct targeted outreach to local construction companies to raise awareness about and increase compliance with the equipment idling ordinance.

Waste

Reducing GHG emissions released from community waste can be done by reducing the amount of waste that the community creates and capturing emissions released from landfills. This reduction can take a variety of forms, from reducing the amount of packing used in commercial products to reimagining alternative uses for items that might otherwise be considered garbage. The types of waste produced in Ontario include food waste, construction and demolition waste, household appliances, and single-use plastics. Strategies to reduce waste must be tailored to reflect the unique uses and composition of each of these materials. Waste reduction and reuse measures reduce emissions by reducing the amount of material that would otherwise decompose in a landfill. The emissions from decomposing waste can be captured and used for electricity, offsetting emissions from electricity use for facility operations.

STRATEGY 18 METHANE CAPTURE AT LANDFILLS

Support efforts to reduce methane emissions from regional landfills.

Strategy 18 GHG Reduction Potential	2030	2050
Absolute GHG Reduction ($MTCO_2e$)	22,410	57,370
Per capita GHG Reduction ($MTCO_2e$ per capita)	0.0558	0.0812

STRATEGY 18 ACTIONS:

- Encourage efforts to coordinate with regional landfills to install methane capture technology and associated monitoring systems with a goal of increasing the methane capture rate to the highest extent feasible.
- Encourage the use of captured methane for generating electricity to offset fossil fuel energy use and reduce GHG emissions.

STRATEGY 19 WASTE DIVERSION

Exceed waste diversion goals recommended by AB 939 and CALGreen by adopting a citywide diversion target of at least 75 percent of waste.

Strategy 19 GHG Reduction Potential	2030	2050
Absolute GHG Reduction ($MTCO_2e$)	14,490	38,670
Per capita GHG Reduction ($MTCO_2e$ per capita)	0.0361	0.0547

STRATEGY 19 ACTIONS:

- Establish a source-reduction program that promotes options to rethink, refuse, reduce, reuse, regenerate, recycle, and recover materials by working with regional partners.
- Establish sharing, exchange, and reuse program(s), including fix-it clinics, swap events, second-hand markets, and shop-local campaigns, by working with community and regional partners.
- Promote awareness of life-cycle emissions of products through public outreach campaigns.
- Explore options to develop and adopt an ordinance to prohibit specific types of single-use or disposable plastics, particularly for use by restaurants, caterers, and other commercial kitchens.
- Engage with businesses using food packaging to determine barriers to switching to biodegradable or compostable food packaging and work to remove those barriers.
- Provide educational outreach programs to multifamily residents, multifamily property owners, single-family homeowners, and business owners to support composting programs.
- Increase the share of Ontario residents and business owners that have green compost carts or bins by working with waste haulers.
- Provide counter-top compost bins to residents of Ontario by working with regional partners and community-based organizations.
- Work with food service facilities to understand barriers to composting and work to mitigate these concerns.
- Encourage local restaurants to partner with food rescue organizations to divert food that would otherwise be thrown away to nonprofit organizations for distribution to those in need.
- Explore options to develop and adopt an ordinance requiring residences, businesses, and City facilities to practice responsible appliance disposal for all decommissioned units, including refrigerators/freezers, window air-conditioning units, and dehumidifiers.

STRATEGY 20 CONSTRUCTION AND DEMOLITION WASTE RECOVERY ORDINANCE

Increase the amount of waste recycled during construction and demolition of buildings. This measure is supportive of community-wide GHG reduction goals and does not have directly measurable GHG reductions.

Strategy 20 GHG Reduction Potential	2030	2050
Absolute GHG Reduction ($MTCO_2e$)	None (supportive)	None (supportive)
Per capita GHG Reduction ($MTCO_2e$ per capita)	None (supportive)	None (supportive)

STRATEGY 20 ACTIONS:

- In compliance with AB 939 and CALGreen, implement an ordinance requiring building projects to recycle or reuse at least 50 percent of unused or leftover building materials.
- Incentivize the recycling of construction debris by working with regional partners.
- Research and consider providing financial incentives to encourage the recycling of construction debris.
- Determine how certain construction materials may be donated and reused to help those in need by working with local community-based organizations and construction companies.

Water and Wastewater

Increasing water recycling and efficiency of water use reduces emissions by reducing the amount of energy needed to process, heat, and deliver water. In addition to saving energy, water conservation and efficiency helps protect one of California's most precious resources, and in turn helps the City of Ontario to be more resilient to drought and water shortage. Meanwhile, individual homes and businesses benefit from reduced utility costs. This CCAP also recommends strategies to increase efficiency of water and wastewater treatment processes, which can reduce the amount of electricity required to operate water treatment facilities, further reducing GHG emissions in the water and wastewater sector.

STRATEGY 21 INDOOR WATER EFFICIENCY

Encourage water-efficient retrofits of new and existing buildings by working with water providers and regional agencies.

Strategy 21 GHG Reduction Potential	2030	2050
Absolute GHG Reduction ($MTCO_2e$)	4,580	2,540
Per capita GHG Reduction ($MTCO_2e$ per capita)	0.0114	0.0036

STRATEGY 21 ACTIONS::

- Explore establishing a reach code for water efficiency standards applicable to new residential and commercial development.
- Explore a target for reduced indoor and outdoor water use in existing buildings.
- Partner with Ontario Municipal Utilities Company to encourage water conservation at municipal facilities and in the community.
- Publicize available incentives and low-cost solutions to water-efficiency retrofits in existing buildings.
- Provide incentives for water-efficient appliances, plumbing fixtures, and irrigation systems to encourage improved water efficiency.

STRATEGY 22 WATER EFFICIENT LANDSCAPES AND WATER RECYCLING

Promote drought-tolerant and fire-wise landscaping. Encourage increased use of reclaimed water for landscape irrigation, agricultural, and industrial use.

Strategy 22 GHG Reduction Potential	2030	2050
Absolute GHG Reduction ($MTCO_2e$)	3,400	0
Per capita GHG Reduction ($MTCO_2e$ per capita)	0.0085	0.0000

STRATEGY 22 ACTIONS:

- Develop a native, drought-tolerant, and fire-resistant landscaping list and require new development or redevelopment to use this list in landscaping plans.
- Enforce, and update as appropriate, the Water-Efficient Landscaping Ordinance to reduce outdoor water use.
- Encourage water-efficient landscaping practices through incentives and rebates for residential landscapes.
- Reduce municipal outdoor water use through a water monitoring and management system for all City irrigation operations.

STRATEGY 23 WATER SYSTEM AND WASTEWATER OPERATIONS EFFICIENCY

Maximize efficiency at drinking water treatment, pumping, and distribution facilities, including development of off-peak-demand schedules for heavy commercial and industrial users.

Strategy 23 GHG Reduction Potential	2030	2050
Absolute GHG Reduction ($MTCO_2e$)	150	0
Per capita GHG Reduction ($MTCO_2e$ per capita)	0.0004	0.0000

STRATEGY 23 ACTIONS:

- Work with the Inland Empire Utilities Agency, the local wastewater treatment provider, to upgrade and replace wastewater treatment and pumping equipment with more energy efficient equipment as feasible.
- Assess and upgrade City-owned water pumping and treatment equipment, as needed, to increase energy efficiency and save energy costs.

STRATEGY 24 METHANE CAPTURE FOR WASTEWATER TREATMENT

Work with Inland Empire Utilities Agency, the local wastewater treatment provider, to increase methane capture rate.

Strategy 24 GHG Reduction Potential	2030	2050
Absolute GHG Reduction ($MTCO_2e$)	960	2,280
Per capita GHG Reduction ($MTCO_2e$ per capita)	0.0024	0.0032

STRATEGY 24 ACTIONS:

- Work with Inland Empire Utilities Agency to explore the possibility of generating electricity from captured methane to power various facilities and reduce operating costs.

Agriculture

Historically, Ontario was an agricultural community with abundant dairy farms. Dairy farms that remain operational in the city limits contribute to the release of methane, a powerful greenhouse gas with approximately 28 times the global warming potential (GWP) of carbon dioxide over a 100-year period.[26] This CCAP recommends strategies that involve collaboration with regional partners, agencies, and members of the agricultural community to reduce GHG emissions from the agriculture sector in Ontario.

STRATEGY 25 METHANE CAPTURE FOR DAIRY OPERATIONS

Encourage and incentivize local dairy operations to reduce methane emissions through methane capture technology.

Strategy 25 GHG Reduction Potential	2030	2050
Absolute GHG Reduction ($MTCO_2e$)	3,160	0
Per capita GHG Reduction ($MTCO_2e$ per capita)	0.0079	0

STRATEGY 25 ACTIONS:

- To comply with SB 1383, work with local dairies to encourage installation of methane digesters to capture methane emissions from decomposing manure.

In addition to the GHG reduction strategies that address specific sources of Ontario's GHG emissions, this CCAP recommends strategies that help to successfully implement the CCAP but are not currently quantifiable actions. These actions are included to complement the strategies for specific sectors, including climate change education, carbon sequestration, and green jobs.

Leadership

STRATEGY 26 CLIMATE CHANGE AWARENESS AND EDUCATION

Promote climate change awareness and GHG reduction community-wide through a variety of mechanisms, including support of climate change education in schools or community colleges.

STRATEGY 26 ACTIONS:

- Promote educational resources to students and parents each year and encourage community educators to incorporate clean energy and climate change discussions into their curriculum by partnering with CSU San Bernardino and school districts.
- Use City newsletters to spotlight community members, including K-12 teachers and students, who are working on climate change or sustainability and who are making a difference in our community.
- Increase energy educational resources in the Ontario School District and Ontario-Montclair School District by working with the San Bernardino County Office of Education.
- Work with nonprofits and community-based organizations to develop a list of green volunteer opportunities and skills trainings for high school students, such as community gardening, tree planting, bicycle advocacy, food recovery, and composting.
- Promote and support opportunities for Ontario community members to test appliances and equipment that support increased energy and water conservation and transitions to all-electric appliances.

TREE PLANTING IN ONTARIO

Since 2019, the City has planted 1,000 trees of five different species: tulip tree (*Liriodendron tulipifera*), pink trumpet tree (*Handroanthus impetiginosus*), London plane tree (*Platanus* x *hispanica*), Chinkapin oak (*Quercus muehlenbergii*), and Chinese flame tree (*Koelreuteria bipinnata*). As part of Ontario Together, 365 native oak trees were planted in disadvantaged communities in Central Ontario. Trees provide numerous social and ecological benefits to the community—they provide shade, offer wildlife habitat, help purify the air, sequester carbon, absorb water, and improve aesthetics and property values in neighborhoods and commercial areas.

Carbon Sequestration

STRATEGY 27 CARBON SEQUESTRATION

Establish a City-wide carbon sequestration project and sequestration goal of 5,000 $MTCO_2e$ per year.

STRATEGY 27 ACTIONS:

- Organize citywide tree planting volunteer days, prioritizing public schools and neighborhoods in environmental justice areas, as an extension of the City's urban forestry program.
- Conduct public workshops to educate community members about the ecological, social, and economic benefits of trees and provide basic training in tree planting and maintenance.
- Seek grants in partnership with community-based organizations to fund the carbon sequestration project.
- Publicize the carbon sequestration project to raise awareness about the project and recruit volunteers.
- Explore opportunities to establish a carbon offset program for development projects, ensuring that offset activities occur in California, and that they occur locally or regionally to the greatest extent possible. GHG reductions from carbon offsets must be real, permanent, quantifiable, verifiable, and enforceable.

Economy

STRATEGY 28 GREEN JOBS

Support green-jobs training and opportunities to create sustainable, living wage, quality employment opportunities

STRATEGY 28 ACTIONS:

- Partner with community colleges, local nonprofits, and community groups to provide green-jobs training for residents.
- Provide information about green jobs, especially to people currently or recently working in polluting or extractive industries.
- Collaborate with community-based organizations and regional partners to amend the City's economic development strategy and attract businesses to Ontario that contribute to a sustainable economy.

Summary of Total GHG Emissions Reductions

Collectively, the strategies in this chapter achieve substantial GHG reductions for the years 2030 and 2050 that amount to 0.541 $MTCO_2e$ per capita and 1.092 $MTCO_2e$ per capita, respectively. **Table 20** shows the reductions achieved by topic, and **Figure 5** shows these reductions relative to Ontario's community-wide emissions. The three sectors with the greatest potential to reduce community-wide GHG emissions are the transportation sector, energy sector, and waste sector, in that order.

Table 20 Absolute and Per Capita GHG Emission Reduction Potential by Sector

Sector	2030 Emissions ($MTCO_2e$)	2050 Emissions ($MTCO_2e$)	2030 Emissions ($MTCO_2e$ per capita)	2050 Emissions ($MTCO_2e$ per capita)
Transportation	56,950	132,410	0.142	0.187
Energy	97,170	511,760	0.242	0.724
Off-road	4,850	26,120	0.012	0.037
Waste	36,900	96,040	0.092	0.136
Water	11,290	2,540	0.028	0.004
Agriculture	960	2,280	0.002	0.003
Total	**208,120**	**771,150**	**0.518**	**1.092**

In total, implementation of this CCAP is projected to reduce Ontario's GHG emissions to 1,414,620 $MTCO_2e$ by 2030 and to 926,610 $MTCO_2e$ by 2050. This has the potential to reduce 2030 emissions to 49 percent below 2005 levels and reduce 2050 emissions to 83 percent below 2008 levels. The CCAP strategies provide a flexible path to reduce the community's GHG emissions to meet the City's adopted 2030 and 2050 emission targets and to support the State's adopted target for 2030 and its goal to achieve carbon neutrality by 2045. Ontario's 2030 and 2050 GHG reduction targets are 6.0 $MTCO_2e$ per capita in 2030 and 2.0 $MTCO_2e$ per capita in 2050, as shown in **Table 21**.

Figure 5 Ontario Per Capita GHG Emissions with Reduction Strategies, 2019 to 2050

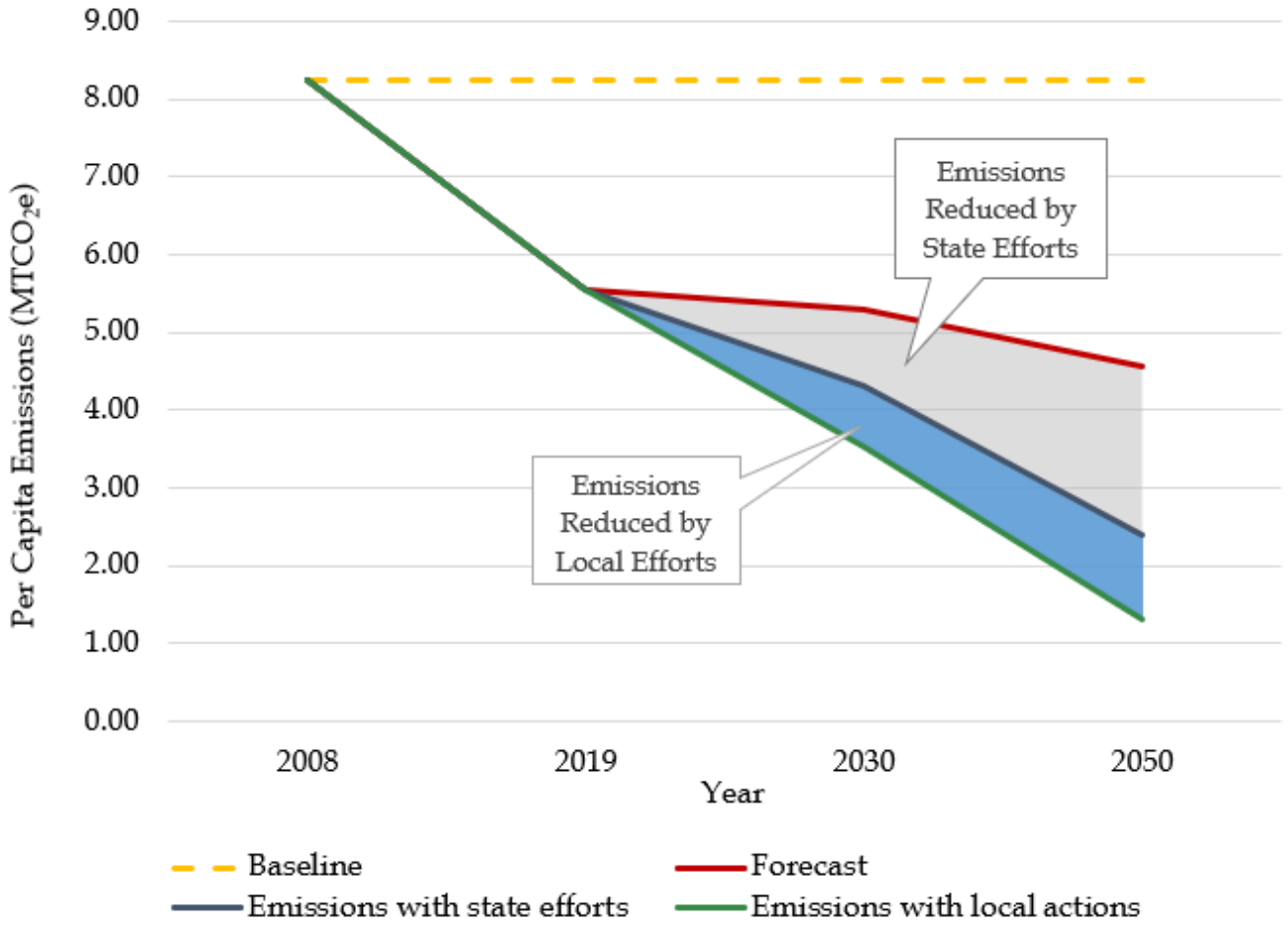


Table 21 Progress to Absolute and Per Capita GHG Emissions Targets

Target	2030 Description	2050 Description
Baseline Emissions	8.25 $MTCO_2e$ per person	8.25 $MTCO_2e$ per person
Target	6.0 $MTCO_2e$ per person	2.0 $MTCO_2e$ per person
Emissions with All Measure Reductions	3.52 $MTCO_2e$ per person	1.31 $MTCO_2e$ per person

6. IMPLEMENTATION

To ensure the success of the 2022 CCAP update, the City of Ontario will integrate the goals and strategies of this plan into TOP 2050 and other City plans as applicable and prioritize and implement the programs and activities in those plans. As the City moves forward with updating other planning documents, such as the municipal and zoning codes or specific plans, staff will ensure that these documents support and are consistent with the CCAP.

Implementing the 2022 CCAP will require City leadership to execute these strategies and report progress. This CCAP contains a work plan that includes responsible departments/divisions, time frames, and relative costs associated with each measure. Staff will monitor progress on an annual basis and will provide an annual update to City decision-makers.

As part of CCAP implementation, staff will apply some strategies and actions to existing or new development projects through the City's permit application and review process. A separate and forthcoming supplement to the Implementation Strategy will be screening tables for use by project applicants as part of applicable permit application processes.

The strategies in this CCAP are accompanied by a list of recommended actions selected by City staff and stakeholders. The list of recommended actions represents suggested means of achieving the measure but are not a prescriptive path to implementation. Furthermore, not all the listed actions may be necessary for the City to achieve its GHG reduction target or support Ontario's GHG reduction goals.

Due to ongoing changes in technology and regulations and the emergence of new best practices and funding opportunities, this approach enables the City to adapt and leverage new opportunities or partnerships without being constrained by a specific implementation pathway. The City's Sustainability Program Manager will serve as an ongoing advisor for CCAP implementation. As part of annual progress reports, the Sustainability Program Manager and City staff will evaluate the effectiveness of each measure to ensure that anticipated reductions are occurring. If reductions do not occur as expected, the City can modify and add additional strategies to the CCAP to ensure the reduction target is achieved.

The following strategies and associated actions are designed to guide Ontario in successfully implementing the CCAP.

Implementation Strategies

Implementation Strategy 1: Monitor and report progress toward Community Climate Action Plan target achievement on an annual basis.

- Assign responsibility for facilitating and supporting CCAP implementation to the City's Community Development Agency.
- Identify key staff from each department responsible for supporting the Sustainability Program Manager with information and updates for annual reporting and monitoring.
- Continue to involve community partners and other key stakeholders in reviewing and recommending CCAP action items.
- Prepare an annual progress report on implementation of the recommended GHG reduction strategies for review and consideration by the City Council. When information is available, provide updates on estimated GHG emissions reductions and current GHG emissions levels.

Implementation Strategy 2: Continue collaborative partnership with agencies and community groups that support Community Climate Action Plan implementation.

- Continue formal membership and participation in local and regional organizations that provide tools and support for energy efficiency, energy conservation, GHG emissions reductions, adaptation, public information, and implementation of this CCAP.
- As appropriate and at the direction of City Council, commit to formal membership through joint powers authorities or other partnerships to implement high priority strategies from the CCAP.
- Provide policy input to partner agencies (e.g., League of Cities) on policy barriers that need to be addressed at the State level.

Implementation Strategy 3: Secure necessary funding to implement the Community Climate Action Plan.

- Identify funding sources and levels for reduction strategies as part of annual reporting.
- Include emissions reduction strategies in department work plans, the capital improvement program, and other plans as appropriate.
- Pursue local, regional, State, and federal grants to support implementation.
- Explore dedicated funding sources for CCAP implementation.
- Explore opportunities to allocate a portion of revenues from revenue-generating strategies to CCAP implementation.

Implementation Strategy 4: Continue to update the baseline emissions inventory and Community Climate Action Plan every five years.

- Prepare a GHG emissions inventory no later than for the calendar year 2024 that shows GHG emissions after emergency conditions created by the COVID-19 pandemic are expected to have ended.
- Update the CCAP within five years of adoption to incorporate new technology, practices, and other options to further reduce emissions.

Implementation Strategy 5: Maintain and update the Community Climate Action Plan to allow for greater resilience.

- Coordinate updates of the CCAP, General Plan Safety Element (TOP 2050), and Local Hazard Mitigation Plan cycle to ensure plan alignment and coordination of climate mitigation and adaptation efforts.
- Assess the implementation status and effectiveness of CCAP strategies.

Work Plan

The Work Plan contains information to support staff and community implementation of the strategies to effectively integrate them into budgets, the capital improvement program, and other programs and projects. The strategies of success are defined as follows:

Strategy Number: The abbreviation that is used to refer to the strategies in the CCAP and all corresponding workbooks.

Strategy: The language used to guide actions needed for reductions.

GHG Reductions ($MTCO_2e$): Amount of GHG emissions reduced by 2030 and 2050.

City Staff Time: The estimated cost to the City (in staff hours) to complete implementation of the strategy, ranked as:

- Low (less than 80 hours)
- Medium (80 to 500 hours)
- High (more than 500 hours)

Time Frame: The year by which a strategy should be effective by fiscal year's end. The exact status of a strategy will vary based on its actions, and many strategies will be ongoing through and beyond 2030. An effective strategy is one that will be actively on track to achieve its targeted GHG emissions reductions and performance standards. Performance standards are the level that should

be met or exceeded to support overall achievement of the community's GHG reduction. **Appendix A** includes the performance assumptions and standards for each quantified strategy. For a strategy to be effective, the necessary programs and efforts should be active, and any infrastructure or other capital improvements should be in place. The effective year is not the end year, as many of the strategies are programs that are intended to remain in effect for the foreseeable future, and so they do not have end dates. Time frames for effectively setting up the strategies are described as follows:

Criteria	Immediate	Short-term	Midterm	Long-term
Prioritization	Highest	High	Medium	Low
Initiation Timeline	Within one year	Within 3 years	Within 3 to 5 years (when resources are available)	Within 6+ years
Completion Timeline	As soon as possible	As soon as feasible	High priority after 3 years and completed within 8 years	When appropriate or possible

Lead Department: The lead City department tasked with implementing the strategy.

Partners: Example local organizations that the City will partner with in implementing the given policy. Additional community partners will be welcome.

Although significant GHG reduction policies and initiatives are already in place, the actions proposed in this plan, by necessity, far surpass the scale of existing efforts. Implementing the plan and ensuring that it results in real, additional GHG emissions reductions will require increased coordination across sectors and institutionalizing climate protection efforts across the community. The large number of strategies and programs recommended in this plan will take many years to implement, given limitations in both staff time and funding.

This chapter outlines the main components of the process for turning this plan into action and identifies specific actions from earlier chapters that are recommended for short-term implementation. While short-term priorities are illustrated, please note that priorities can and do shift based on funding availability, advances in technology, new and better ideas, and other reasons. The CCAP and this implementation section should be considered a living document. A summary of the implementation work plan for each strategy can be seen in **Table 22.**

Table 22 GHG Reduction Strategy Implementation Work Plan

Strategy No.	Strategy	2030 GHG Reduction ($MTCO_2e$)	2050 GHG Reduction ($MTCO_2e$)	2030 Per Capita GHG Reduction ($MTCO_2e$ per person)	2050 Per Capita GHG Reduction ($MTCO_2e$ per person)	City Staff Time	Time Frame	Lead Department(s)/ Agency	Community Partners
1	**Building electrification** Promote and incentivize the phase-out of gas appliances in new and existing homes and businesses throughout the community to advance GHG reductions, increase energy efficiency, and protect public safety and environmental health.	10,310	102,640	0.026	0.145	High	Short-term	Building	SCE, SoCalGas, SoCalREN, Building Industry Association of Southern California (BIASC)
2	**Onsite solar energy for existing residential development** Continue to support and facilitate installation of rooftop solar photovoltaic and onsite solar energy systems in existing residential development.	2,040		0.005	0.000	Medium	Short-term	Building Public Works Agency	SCE, SoCalGas, SoCalREN, Inland Valley Association of Realtors (IVAR)
3	**Onsite solar energy systems for nonresidential development** Ensure new large non-residential development, including City facilities, includes onsite renewable energy to support the site's energy needs by requiring solar photovoltaic panels or other appropriate onsite renewable energy generation systems for the following types of projects: • New commercial and office buildings, or existing commercial and office building expansions greater or equal to 45,000 square feet in size. • New industrial or existing industrial buildings expansions greater or equal to 100,000 square feet in size.	26,480	0	0.066	0.000	Medium	Short-term	Building	SCE, SoCalGas, SoCalREN, Greater Ontario Chamber of Commerce, Ontario Hispanic Chamber of Commerce
4	**Green roofs** Promote and incentivize residents and business owners to install green roofs to conserve energy and reduce surface water runoff.	Less than 10	Less than 10	0.000	0.000	Low	Medium-term	Building Public Works Agency	SCE, Summertree Institute, Greater Ontario Chamber of Commerce, Ontario Hispanic Chamber of Commerce

Strategy No.	Strategy	2030 GHG Reduction ($MTCO_2e$)	2050 GHG Reduction ($MTCO_2e$)	2030 Per Capita GHG Reduction ($MTCO_2e$ per person)	2050 Per Capita GHG Reduction ($MTCO_2e$ per person)	City Staff Time	Time Frame	Lead Department(s)/ Agency	Community Partners
5	**Urban cooling** Maintain and expand the City's existing tree canopy, with a goal of planting 500 trees annually through 2050 and promote the use of pervious concrete and cool pavement for pavement projects.	5,610	12,730	0.014	0.018	Medium	Short-term	Landscape Planning Public Works Agency	Inland Empire Resource Conservation District (IERCD), Inland Urban Forest Council
6	**Energy efficiency retrofits for low-income households** Promote and incentivize voluntary energy efficiency retrofits of homes to reduce natural gas and electricity usage, with the goal of retrofitting 9,000 low-income homes by 2050. Partner with community services agencies to fund energy efficiency projects, including heating, ventilation, air conditioning, indoor lighting, water heating equipment, insulation, and weatherization for low-income residents.	940	1,440	0.002	0.002	High	Short-term	Housing Building	SCE, SoCalGas, SoCalREN
7	**Energy efficiency retrofits** Promote and incentivize voluntary energy efficiency retrofits to reduce in natural gas and electricity usage. Partner with regional agencies to expand access to existing energy efficiency and conservation opportunities, incentives, and technical assistance for residents and businesses.	11,570	15,600	0.029	0.022	Medium	Short-term	Building	SCE, SoCalGas, SoCalREN
8	**Smart growth and infill** Encourage revitalization of neighborhoods through higher-density, mixed-use, infill development and creative reuse of under-utilized sites within the urban core.	-	-	-	-	High	Short-term	Planning Housing Economic Development	Downtown Community Benefit District, Healthy Ontario, Ontario Together
9	**Transit-oriented development** Encourage development of compact, mixed-use, and transit-oriented development to improve the regional jobs-housing balance, especially on corridors served by high-ridership transit and bus rapid transit, such as Holt Avenue.	330	1,440	0.001	0.002	Low	Short-term	Planning Transportation Engineering	Omnitrans, SBCTA
10	**Increase transportation ridership** Ensure a reliable and responsive transit system with dedicated and secure funding and resources to support increased ridership.	27,980	31,450	0.070	0.045	Medium	Long-term	Planning Transportation Engineering	Omnitrans, SBCTA
11	**Traffic signal synchronization and roadway management**	-	-	-	-	Medium	Medium-term	Transportation	SCAQMD, SBCTA

Strategy No.	Strategy	2030 GHG Reduction ($MTCO_2e$)	2050 GHG Reduction ($MTCO_2e$)	2030 Per Capita GHG Reduction ($MTCO_2e$ per person)	2050 Per Capita GHG Reduction ($MTCO_2e$ per person)	City Staff Time	Time Frame	Lead Department(s)/ Agency	Community Partners
	Implement traffic and roadway management strategies to improve mobility and efficiency and reduce associated emissions.							Engineering	
12	**Community vehicle electrification** Promote and incentivize the adoption of electric vehicles (EV) citywide, including light-duty and heavy-duty vehicles, for municipal, commercial, and residential uses.	62,880	465,140	0.157	0.658	Low	Medium-term	Public Works Agency Planning	SCAQMD
13	**Active Transportation Networks** Work with transit agencies, school districts, and employers to facilitate an interconnected transportation system that allows a shift in travel from private passenger vehicles to alternative modes, including public transit, ride sharing, car sharing, bicycling, and walking.	1,800	3,840	0.0045	0.0054	Medium	Medium-term	Transportation Engineering	SCAQMD SBCTA
14	**Vehicle idling** Limit idling of heavy-duty trucks. Support the SCAMQD and CARB anti-idling requirements and provide signage in key areas where idling that is not consistent with SCAMQD or CARB requirements might occur.	1,950	1,780	0.005	0.003	Low	Short-term	Public Works Agency Planning	SCAQMD
15	**Parking policy and event parking** Adopt a comprehensive parking policy that encourages carpooling and the use of alternative transportation, including providing parking spaces for car-share vehicles at convenient locations accessible by public transportation.	2,230	8,110	0.006	0.011	Low	Medium-term	Planning Economic Development	Greater Ontario Chamber of Commerce, Ontario Hispanic Chamber of Commerce, Ontario Convention Center, Toyota Arena
16	**Electrification of construction and landscaping equipment** Promote and incentivize the transition to electric construction and landscaping equipment.	4,810	26,020	0.012	0.037	Low	Long-term	Planning Public Works Agency	SCAQMD, Building Industry Association of Southern California (BIASC)
17	**Idling ordinance for construction equipment** Limit idling of heavy-duty off-road construction equipment to reduce air pollution and GHG emissions from construction activity.	40	100	0.000	0.000	Low	Medium-term	Planning Building	SCAQMD, Building Industry Association of Southern California (BIASC)
18	**Methane capture at landfills** Support efforts to reduce methane emissions from regional landfills.	22,410	57,370	0.056	0.081	Short	Medium-term	Public Works	Barstow Landfill and Rialto Landfill
19	**Waste diversion** Exceed waste diversion goals recommended by	14,490	38,670	0.036	0.055	Medium	Short-term	Integrated Waste	San Bernardino County Waste Management Division

Strategy No.	Strategy	2030 GHG Reduction ($MTCO_2e$)	2050 GHG Reduction ($MTCO_2e$)	2030 Per Capita GHG Reduction ($MTCO_2e$ per person)	2050 Per Capita GHG Reduction ($MTCO_2e$ per person)	City Staff Time	Time Frame	Lead Department(s)/ Agency	Community Partners
	AB 939 and CALGreen by adopting a citywide diversion target of at least 75 percent of waste.								
20	**Construction and Demolition Waste Recovery Ordinance** Increase the amount of waste recycled during construction and demolition of buildings.	-	-	-	-	Low	Medium-term	Integrated Waste	Building Industry Association of Southern California (BIASC), Integrated Waste Management
21	**Indoor water efficiency** Encourage water-efficient retrofits of new and existing buildings by working with water providers and regional agencies.	4,580	2,540	0.011	0.004	Medium	Medium-term	Ontario Municipal Utilities Company Public Works Agency	San Bernardino County Water Resources Division, Inland Empire Clean Water Partnership, Building Industry Association of Southern California (BIASC), SCE Annual Water Conference
22	**Water efficient landscapes and water recycling** Promote drought-tolerant and fire-wise landscaping. Encourage increased use of reclaimed water for landscape irrigation, agricultural, and industrial use.	3,400	0	0.008	0.000	Low	Medium-term	Landscape Planning Public Works Agency	Summertree Institute
23	**Water system and wastewater operations efficiency** Maximize efficiency at drinking water treatment, pumping, and distribution facilities, including development of off-peak-demand schedules for heavy commercial and industrial users.	150	0	0	0	Low	Long-term	Ontario Municipal Utilities Company Inland Empire Utilities Agency (IEUA)	San Bernardino County Water Resources Division, Inland Empire Clean Water Partnership, SCE Water Conference
24	**Methane capture for dairy operations** Encourage and incentivize local dairy operations to reduce methane emissions through methane capture technology.	3,160	0	0.008	0	Low	Long-term	Planning	Local dairies
25	**Methane capture for wastewater treatment** Work with Inland Empire Utilities Agency, the local wastewater treatment provider, to increase methane capture rate.	960	2,280	0.002	0.003	Low	Long-term	Ontario Municipal Utilities Company Inland Empire Utilities Agency (IEUA)	
26	**Climate change awareness and education** Promote climate change awareness and GHG reduction community-wide through a variety of mechanisms, including support of climate change education in schools or community colleges.	-	-	-	-	Low	Medium-term	Management Services Agency Planning	Center for Community Action and Environmental Justice (CCAEJ), Community Climate Connection Inland Empire, Huerta del Valle Community Garden, Platt College, SJVC Ontario,

Strategy No.	Strategy	2030 GHG Reduction ($MTCO_2e$)	2050 GHG Reduction ($MTCO_2e$)	2030 Per Capita GHG Reduction ($MTCO_2e$ per person)	2050 Per Capita GHG Reduction ($MTCO_2e$ per person)	City Staff Time	Time Frame	Lead Department(s)/ Agency	Community Partners
									Cambridge College of Southern California
27	**Carbon sequestration** Establish a City-wide carbon sequestration project and sequestration goal of 5,000 $MTCO_2e$ per year.	-	-	-	-	Low	Short-term	Landscape Planning Public Works Agency	Center for Community Action and Environmental Justice (CCAEJ), Community Climate Connection Inland Empire
28	**Green jobs** Support green job trainings and opportunities to create sustainable, living wage, quality employment opportunities.	-	-	-	-	Medium	Long-term	Economic Development	San Bernardino County Workforce Development Board, Inland Empire Small Business Development Center (IESBDC)

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7. GLOSSARY

Carbon neutrality: When carbon dioxide and other greenhouse gas (GHG) emissions generated by sources such as transportation, power plants, and industrial processes are less than or equal to the amount of carbon dioxide that is stored, both in natural sinks such as forests and mechanical sequestration such as carbon capture and sequestration. The State of California's goal is to achieve carbon neutrality no later than 2045.

Climate change: A change in the state of the climate that can be identified by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer.

Community asset: A valued feature of a community that may be harmed by climate change. Community assets may include buildings, infrastructure, community services, ecosystems, and economic drivers.

Disadvantaged communities: Areas disproportionately affected by environmental pollution and other hazards that can lead to negative public health effects, exposure, or environmental degradation, or with concentrations of people that are of low income, high unemployment, low levels of homeownership, high rent burden, sensitive populations, or low levels of educational attainment. Criteria are determined by California legislation. .[27,28]

Equity: The state in which each individual or group is allocated the resources needed to reach an equal outcome.[29]

Exposure: The presence of people, infrastructure, natural systems, and economic, cultural, and social resources in areas that are subject to harm.[30]

Frontline communities: Term used by communities to self-identify as places that experience the impacts of issues such as environmental pollution, climate change, and the economic crisis first and most severely. These communities are most often communities of color and low income.[31]

Hazard mitigation: Sustained action taken to reduce or eliminate the long-term risk to human life and property through actions that reduce hazard, exposure, and vulnerability.[32]

Impact: The effects (especially the negative effects) of a hazard or other conditions associated with climate change.

Resilience: The capacity of any entity—an individual, a community, an organization, or a natural system—to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience. Community resilience is the ability of communities to withstand, recover, and learn from past disasters to strengthen future response and recovery efforts.

Risk: The potential for damage or loss created by the interaction of hazards with assets such as buildings, infrastructure, or natural and cultural resources.

Sensitivity: The level to which a species, natural system, or community, government, etc., would be affected by changing climate conditions.[33]

APPENDIX A. GHG TECHNICAL APPENDIX

This appendix provides details for the GHG emissions forecast and summarizes the data sources, assumptions, and performance metrics used to calculate the potential for GHG savings from the community-wide reduction strategies in the Ontario Community Climate Action Plan (CCAP). **Chapter 3** of the CCAP provides details of the GHG inventory and forecast. **Chapter 5** of the CCAP provides the full list of measures to reduce GHG emissions.

Community-Wide Forecast

The community-wide forecast is a projection of future GHG emissions from the sources in Ontario's GHG inventory. The community-wide forecast of GHG emissions is based on the results of the 2019 community-wide GHG emissions inventory combined with Ontario's 2019 demographics and future demographic projections. These population, housing, and employment projections are based on the estimates of future buildout in TOP 2050. **Table A-1** shows the demographic projections used to prepare the community-wide GHG emissions forecast.

Table A-1 City of Ontario Community-Wide Demographic Projection, 2019 to 2050

Metric	2019	2030	2050	Percentage Change 2019–2050	Relevant Sectors
Population	178,610	232,120	410,490	130%	Off-road equipment
Households	48,280	66,680	124,380	158%	Residential energy, off-road equipment
Residents per household	3.70	3.48	3.30	-11%	None
Jobs	128,640	169,600	296,000	130%	Nonresidential energy, off-road equipment
Service population	307,240	401,720	706,500	130%	Solid, water and wastewater, off-road equipment
Vehicle Miles Traveled (VMT)	2,151,423,590	2,631,468,770	3,504,276,490	63%	Transportation

Sources: 2019 demographic numbers are from US Census, the Department of Finance, and San Bernardino County Transportation Authority (SBCTA). Future demographics are from TOP 2050 buildout projections. Vehicle miles traveled are derived from Fehr and Peers (2019).

1. Service population is the sum of populations and jobs.
2. All numbers except residents per household are rounded to the nearest 10.

The forecast assumes that in 2030 and 2050 each person in Ontario will continue to contribute the same amount of GHG emissions to the community total as they did in 2019, so the amount of GHG emissions changes proportionally to the projected change in community demographics. **Table A-2** shows Ontario's forecast community-wide per capita GHG emissions through 2050.

Table A-2 Forecast Per Capita GHG Emissions, 2008–2050

Sector	2008[1]	2016[1]	2019[1]	2030	2050	Percentage Change, 2008–2050
Transportation	3.51	3.00	3.04	2.84	2.15	-39%
Nonresidential energy	2.77	1.80	1.29	1.30	1.29	-54%
Residential energy	0.72	0.55	0.50	0.53	0.57	-21%
Solid waste	0.28	0.22	0.27	0.27	0.27	-4%
Off-road equipment	0.17	0.08	0.21	0.21	0.21	23%
Agriculture[2]	0.63	0.21	0.16	0.08	0.00	-100%
Water and wastewater	0.15	0.08	0.06	0.06	0.06	-56%
Land use and sequestration	0.01	Less than 0.01	Less than 0.01	Less than 0.01	Less than 0.01	-81%
Total	**8.25**	**5.95**	**5.54**	**5.30**	**4.56**	**-45%**

1. Data shown for 2008, 2016, 2019 are the actual per capita GHG emissions. The data shown for 2030, 2040, and 2050 are GHG per capita emission forecasts, calculated based on projections from the 2019 inventory.
2. GHG emission projects for the agriculture are based on the assumption that, by 2050, all agricultural land will be developed and converted to other land uses, so agricultural emissions will decrease to zero by 2050.

Ontario's residential population and worker population are both projected to grow by 130 percent between 2019 and 2050. During the same period, the city's forecast per capita emissions are expected to decrease from 5.54 $MTCO_2e$ to 4.56 $MTCO_2e$ per person in 2050, a decrease of 18 percent (see **Table A-3**).

Relative to 2008 levels, the City of Ontario's absolute community-wide GHG emissions are expected to increase by 89 percent in 2050. This projection accounts for emission changes from land use and carbon sequestration. This is a worst-case projection that assumes that no one at any level takes action, including state, regional, and local agencies. In terms of absolute emissions, the four sectors that are forecast to experience the largest increase in GHG emissions between 2019 and 2050 are the residential and nonresidential energy sectors, solid waste, and water and wastewater. The growth in emissions associated with residential and nonresidential energy use would result

the expected large increases in the city's population and number of jobs over the next three decades. Similarly, the growth in emissions forecast for solid waste and water and wastewater are due to the anticipated large increase in the city's service population—i.e., both residential population and employment.

The only sector that experiences a decrease in GHG emissions in the future is the agricultural sector, a sector that is rapidly disappearing in Ontario due to economic change, population growth, and urbanization. By 2050, all agricultural lands existing within the city limits are expected to be replaced by urban development.

The forecast assumes emissions scale proportionally to demographic growth, which means most of the sectors grow at a similar rate to the growth in demographics, as seen by comparing the percentage changes in **Table A-1**. However, some emissions, notably those from on-road transportation, grow at a slower rate due to the nature of the modeling process. As noted above, the overall community-wide absolute emissions are projected to grow 89 percent from 2019 to 2050, and Ontario's service population is projected to grow 130 percent over this period. Since the rate of population increase is greater than the rate of GHG emission increase, the per-capita emissions decrease over time.

As the city grows, changes in activity across different sectors of the economy are also forecasted for 2030 and 2050. The two sectors that are expected to see the greatest increase in activity are residential electricity and residential natural gas. Residential electricity and natural gas use are both forecasted to increase by 158 percent between 2019 and 2050. **Table A-3** shows forecast community-wide activity data by subsector between 2019 and 2050.

Table A-3 Ontario Community-Wide Forecast Activity Data

Subsector	Units	2019	2030	2050	Percent Change, 2019-2050
Residential electricity	kWh	316,529,750	437,202,640	815,532,580	158%
Residential natural gas	Therms	16,945,380	23,405,590	43,659,430	158%
Nonresidential electricity	kWh	1,242,306,720	1,637,865,370	2,858,631,210	130%
Nonresidential natural gas	Therms	26,168,160	34,500,270	60,214,690	130%
Light-duty vehicles	VMT	1,945,876,580	2,380,798,400	3,171,565,080	63%
Heavy-duty vehicles	VMT	205,547,010	250,670,370	332,711,410	62%
Municipal solid waste	Tons	287,980	376,530	662,200	130%
Alternative daily cover	Tons	2,670	3,490	6,140	130%
Transform Waste	Tons	1,030	1,350	2,370	130%
Indirect water energy	kWh	61,387,950	80,264,120	141,159,360	130%
Indirect wastewater energy	kWh	7,672,160	10,031,270	17,641,850	130%
Direct wastewater plant emissions[1]	-	-	-	-	-
Enteric fermentation	Head of livestock	10,890	7,030	0	-100%
Fertilizer application	Tons applied	204	130	0	-100%
Manure management	Head of livestock	10,890	7,026	0	-100%
Off-road equipment sector[2]	-	-	-	-	-
Land use change (conversion of agricultural to urban land)	Acres	3,520	1,700	1,700	22%
Street tree biomass	Acres	740	760	760	14%

All numbers except residents per household are rounded to the nearest 10.

1. There is no activity data for this sector because emissions are not correlated with volume of wastewater produced, but rather the treatment process
2. There is no activity data for this sector because emissions from off-road equipment are estimated from a model developed by the California Air Resources Board rather than from measurable metrics such as fuel consumption.

State GHG Emission Reductions

California has adopted and committed to implementing policies to decrease GHG emission levels statewide, including from several of the major GHG emission sectors present in Ontario. Many of these policies are identified in the State's Climate Change Scoping Plan (Scoping Plan), which was originally adopted in 2008 in response to the California Global Warming Solutions Act. The Scoping Plan outlines several regulatory and market-based solutions to achieve California's GHG emission reduction goals. Successive updates to the Scoping Plan in 2014 and 2017 revised these state-level actions and identified additional opportunities for GHG emission reductions, as applicable.

Though the Scoping Plan and related documents lay out several policies to reduce GHG emissions, the 2022 CCAP will focus on the policies that have the most direct and apparent benefits to Ontario. The PlaceWorks team assessed these efforts and their community-wide local GHG emission-reduction benefits to Ontario, allowing the community to receive "credit" for the state's efforts. These efforts are:

- The Renewables Portfolio Standard (RPS) requires increases in renewable electricity supplies.
- The Clean Car Standards require increased fuel efficiency of on-road vehicles and decreased carbon intensity of vehicle fuels.
- The updated Title 24 Building Energy Efficiency Standards require new buildings to achieve increased energy efficiency targets.
- The Low Carbon Fuel Standard (LCFS) mandates reduced carbon intensity of fuels used in off-road equipment.
- The short-lived climate pollutants law (SB 1383) proposes a comprehensive strategy to reduce methane and other emissions of short-lived greenhouse gases through regulations on dairy operations and urban landfills, including higher diversion rates of food waste from landfills.

State level actions have a significant impact on reduction of GHG emissions when analyzed on a per-capita basis. **Table A-4** shows the per capita GHG emissions resulting from state actions, both community wide and by sector. Under the forecast presented above, per capita GHG emissions decrease by 18 percent from 2019 to 2050. However, when state actions are accounted for, per capita GHG emissions decrease by 57 percent from 2019 to 2050.

Table A-4 Ontario Per Capita GHG Emission Reductions from State Actions, 2019 to 2050

Description	2019 $MTCO_2e$	2030 $MTCO_2e$	2050 $MTCO_2e$	Percentage Change 2019–2050
Per capita emissions without state actions	5.54	5.30	4.56	-18%
Per capita emissions reductions from RPS		0.21	1.13	-
Per capita emissions reductions from Clean Car standards		0.53	0.69	-
Per capita emissions reductions from Title 24		0.19	0.28	-
Per capita emissions reductions from LCFS (off-road only)		0.01	0.01	-
Per capita emissions from SB 1383		0.06	0.06	-
Per capita emission reductions from all state actions		**1.00**	**2.17**	-
Per capita emissions with state actions	**5.54**	**4.31**	**2.39**	**-57%**

Technical Data for Existing and Planned Activities

Quantification of existing and planned activities are calculations that determine the GHG emission reduction potential of strategies recommended in the CCAP. They are based on four primary types of data and research:

The inventory and forecast of San Carlos' GHG emissions, as discussed above, and summarized in Chapter 3 of the CCAP.

- The San Bernardino County GHG Reduction Tool
- California Air Pollution Control Officers Association's (CAPCOA) Handbook for Analyzing GHG Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity
- Peer-reviewed reports and other credible research documents.
- Case studies for similar jurisdictions.

The community-wide inventory and forecast serve as the foundation for the quantification of Ontario's GHG reduction strategies, supplemented with additional data types and research. The inventory and forecast provide activity data, such as kWh of electricity used, or VMT. The project team combined the activity data with data sources that identify the potential for reduction and performance targets that estimate the level of implementation. This provides the total savings in activity data for the years 2030 and 2050. The project team then multiplied the activity data savings by the relevant emissions factor to determine the total GHG savings from the strategy.

This section discusses the data sources, methods, and assumptions for the quantification of the existing and planned local activities. Only some existing and planned local activities are quantified. Other activities, not included here, may have GHG reduction benefits but City staff cannot accurately determine the level of reductions.

Table A-5 shows the emissions factors used in the quantification. These emission factors account for the GHG reductions from existing state actions through 2050, such as RPS. Note that the quantification for many strategies, especially those that related to electricity, will use multiple emissions factors. Some sectors do not have specific emission factors, including direct wastewater and off-road emissions, and were calculated using formulae or models.

Table A-5 Emissions Factors with State Reductions

Sector	Unit	2008	2016	2019	2030	2050	Source
SCE electricity	$MTCO_2e$/ kWh	0.000288	0.000219	0.000208	0.000149	0.000000	SCE
Natural gas	$MTCO_2e$/ therm	0.053816	0.007341	0.005272	0.005272	0.005272	US Community Protocol
On-road transportation (light and medium-duty vehicles)	$MTCO_2e$/ mile	0.000421	0.000363	0.000348	0.000277	0.000253	California Air Resources Board
On-road transportation (heavy duty vehicles)	$MTCO_2e$/ mile	0.000979	0.001248	0.001256	0.001070	0.000734	California Air Resources Board
On-road transportation (total)	$MTCO_2e$/ mile	0.001400	0.001611	0.001604	0.001348	0.001400	California Air Resources Board
Solid waste (municipal solid waste)	$MTCO_2e$/ ton	0.473978	0.532831	0.286062	0.234502	0.473978	CalRecycle
Solid waste (alternative daily cover)	$MTCO_2e$/ ton	-	-	0.247191	0.246418	-	CalRecycle

Existing Activities

Activity 1 Solar PV capacity

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance Standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
310	0	0.0008	0	Residential installations	35	35	Total residential solar capacity (kW)	3,130	3,130
				Nonresidential installations	2	2	Total nonresidential solar capacity (kW)	2,571,130	2,571,130

Sources:

National Renewable Energy Laboratory (NREL). (n.d.). Monthly PV performance data: Ontario, California. PV watts calculator. https://pvwatts.nrel.gov/pvwatts.php

California Energy Commission (CEC). (2019). Power content label 2019: Southern California Edison (SCE). CEC. https://www.energy.ca.gov/filebrowser/download/3265.

California Energy Commission (CEC). (2022.) California Distributed Generation Statistics. https://www.californiadgstats.ca.gov/

National Conference of State Legislatures (NCSL). (2021, August 13). State renewable portfolio standards and goals. NCSL. https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx

Activity 2 All electric and zero net energy buildings

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
90	110	0.0002	0.0002	There are no assumptions for this existing action			Number of all-electric residential units	100	100

Sources:

California Energy Commission (CEC). (2019). Power content label 2019: Southern California Edison (SCE). CEC. https://www.energy.ca.gov/filebrowser/download/3265.

National Conference of State Legislatures (NCSL). (2021, August 13). State renewable portfolio standards and goals. NCSL. https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx

Activity 3 EV charging stations

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
120	140	0.0003	0.0002	Number of EV charging stations	30	30	Number of EV charging stations	30	30

Sources:

California Energy Commission (CEC). (2019). Power content label 2019: Southern California Edison (SCE). CEC. https://www.energy.ca.gov/filebrowser/download/3265.

National Conference of State Legislatures (NCSL). (2021, August 13). State renewable portfolio standards and goals. NCSL. https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx.

Hermann, P. & Hayes, J. (2022). Draft memorandum: The Ontario Plan Transportation Impact Assessment-Vehicle Miles Travelled (VMT). Fehr and Peers.

Greenblatt, J.B. (2015, March). Modeling California policy impacts on greenhouse gas emissions. Berkeley lab. https://eta.lbl.gov/publications/modeling-california-policy-impacts.

Activity 4 G Street crosstown bicycle route

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
30	30	0.0001	0	Percent of community-wide light-duty VMT on G St roadway segment	4%	4%	Miles of bike lanes on G Street	18	18

Sources:

City of Ontario. (2015, June 17). G street crosstown bike route and San Antonio avenue bike corridor. City of Ontario. https://ceqanet.opr.ca.gov/2015068332.

California Air Pollution Control Officers Association (CAPCOA). (2021). Handbook for analyzing greenhouse gas emissions reductions, assessing climate vulnerabilities, and advancing health and equity. CAPCOA. https://www.airquality.org/ClimateChange/Documents/Handbook%20Public%20Draft_2021-Aug.pdf

California Department of Transportation (Caltrans). (2018). California public road data. Caltrans. https://dot.ca.gov/-/media/dot-media/programs/research-innovation-system-information/documents/california-public-road-data/prd-2018-a11y.pdf.

Hermann, P. & Hayes, J. (2022). Draft memorandum: The Ontario Plan Transportation Impact Assessment-Vehicle Miles Travelled (VMT). Fehr and Peers.

Activity 5 Outdoor lighting

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
300	0	0.0007	0	Percentage of streetlights retrofitted since 2019	65%	65%	Number of retrofitted streetlights	8,130	8,130

Sources:

San Bernardino County Transportation Authority (SBCTA). (2021). GHG reduction tool, San Bernardino County GHG reduction plan. SBCTA. https://www.gosbcta.com/plan/regional-greenhouse-gas-reduction-plan/.

California Energy Commission (CEC). (2019). Power content label 2019: Southern California Edison (SCE). CEC. https://www.energy.ca.gov/filebrowser/download/3265.

National Conference of State Legislatures (NCSL). (2021, August 13). State renewable portfolio standards and goals. NCSL. https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx.

Activity 6 Energy efficiency retrofits of municipal buildings

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
660	0	0.0016	0	There are no assumptions for this existing action			Estimated annual energy savings from retrofits in 2020 (kWh)	5,571,640	5,571,640

Sources:

California Energy Commission (CEC). (2019). Power content label 2019: Southern California Edison (SCE). CEC. https://www.energy.ca.gov/filebrowser/download/3265.

National Conference of State Legislatures (NCSL). (2021, August 13). State renewable portfolio standards and goals. NCSL. https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx.

Activity 7 Tree planting

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
1,480	1,480	0.0037	0.0021	There are no assumptions for this existing action			Number of trees planted since 2019	1,000	1,000

Sources:

California Air Pollution Control Officers Association (CAPCOA). (2021). Handbook for analyzing greenhouse gas emissions reductions, assessing climate vulnerabilities, and advancing health and equity. CAPCOA. https://www.airquality.org/ClimateChange/Documents/Handbook%20Public%20Draft_2021-Aug.pdf.

USDA Forest Service. (2006). I-Tree planting calculator. I-Tree. https://planting.itreetools.org/.

California Energy Commission (CEC). (2019). Power content label 2019: Southern California Edison (SCE). CEC. https://www.energy.ca.gov/filebrowser/download/3265.

National Conference of State Legislatures (NCSL). (2021, August 13). State renewable portfolio standards and goals. NCSL. https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx.

Note:

The City currently has plans to plant significantly more than 1,000 trees per year by 2050. The quantification and assumptions for this activity are a minimum threshold and can be exceeded as City and community resources allow.

Activity 8 Installation of efficient industrial water boilers

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
180	180	0.0004	0.0003	There are no assumptions for this existing action			Number of industrial boilers replaced since 2019	6	6

Sources:

California Air Pollution Control Officers Association (CAPCOA). (2021). Handbook for analyzing greenhouse gas emissions reductions, assessing climate vulnerabilities, and advancing health and equity. CAPCOA. https://www.airquality.org/ClimateChange/Documents/Handbook%20Public%20Draft_2021-Aug.pdf.

Activity 9 Increased supply of electricity from renewable sources

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
56,140	0	0.1398	0	There are no assumptions for this existing action			SCE GHG emissions factor (MTCO2e/kWh)	0.000119	0.000000

Sources:

Combs, J. S. and Karlstand, C. A. (2020). SCE 2020 Integrated Resource Plan. Southern California Edison (SCE). https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M346/K291/346291781.PDF.

California Energy Commission (CEC). (2019). Power content label 2019: Southern California Edison (SCE). CEC. https://www.energy.ca.gov/filebrowser/download/3265.

National Conference of State Legislatures (NCSL). (2021, August 13). State renewable portfolio standards and goals. NCSL. https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx

Planned Activities

Strategy 1 Building electrification

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
10,310	102,640	0.0257	0.1453	Penetration rate for electrification of existing homes	10%	25%	New all-electric homes	5,520	45,660
				Penetration rate for electrification of existing non-residential buildings	5%	12%	Existing homes retrofitted to be all-electric	4,830	12,070
				Penetration rate for electrification of new homes	30%	60%	New all-electric square footage for nonresidential buildings	8,166,530	49,941,430
				Penetration rate for electrification of new non-residential buildings	25%	45%	Existing nonresidential square footage retrofitted to be all-electric	9,158,850	21,981,230

Sources:

San Bernardino County Transportation Authority (SBCTA). (2021). GHG reduction tool, San Bernardino County GHG reduction plan. SBCTA. https://www.gosbcta.com/plan/regional-greenhouse-gas-reduction-plan/.

California Energy Commission (CEC). (2019). Power content label 2019: Southern California Edison (SCE). CEC. https://www.energy.ca.gov/filebrowser/download/3265.

National Conference of State Legislatures (NCSL). (2021, August 13). State renewable portfolio standards and goals. NCSL. https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx

PlaceWorks. (2021). TOP 2050, Buildout Projections: Demographic Forecast. PlaceWorks.

Strategy 2 Onsite solar energy for existing residential development

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
2,040	0	0.0051	0	Percent of existing homes with solar panels installed	5%	25%	Number of existing homes with solar panels installed	2,410	12,070

Sources:

San Bernardino County Transportation Authority (SBCTA). (2021). GHG reduction tool, San Bernardino County GHG reduction plan. SBCTA. https://www.gosbcta.com/plan/regional-greenhouse-gas-reduction-plan/.

California Energy Commission (CEC). (2019). Power content label 2019: Southern California Edison (SCE). CEC. https://www.energy.ca.gov/filebrowser/download/3265.

National Conference of State Legislatures (NCSL). (2021, August 13). State renewable portfolio standards and goals. NCSL. https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx

National Renewable Energy Laboratory. 2021. "PVWatts." https://pvwatts.nrel.gov/.

U.S. Environmental Protection Agency. 2021. "Emissions & generation resource integrated database (eGRID)." https://www.epa.gov/egrid.

Strategy 3 Onsite solar energy systems for nonresidential development

GHG Reduction (MTCO2e)		Per capita GHG reduction (MTCO2e per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
26,480	0	0.0659	0	Target percentage of new industrial roof space with electric needs met by on-site solar	90%	90%	kW of solar panels on new industrial space	66,660	45,660
				Target percentage of existing industrial roof space with electric needs met by on-site solar	10%	20%	kW of solar panels on existing industrial space	52,290	12,070
				Target percentage of new nonindustrial nonresidential development with electricity needs met by on-site solar	15%	30%	kW of solar panels on new nonindustrial nonresidential space	4,520	49,941,430
				Target percentage of existing nonindustrial nonresidential development with electricity needs met by on-site solar	5%	15%	kW of solar panels on existing nonindustrial nonresidential space	11,550	21,981,230

Sources:

San Bernardino County Transportation Authority (SBCTA). (2021). GHG Reduction Tool, GHG Reduction Tool, San Bernardino County GHG Reduction Plan. SBCTA. https://www.gosbcta.com/plan/regional-greenhouse-gas-reduction-plan/.

California Energy Commission (CEC). (2019). Power content label 2019: Southern California Edison (SCE). CEC. https://www.energy.ca.gov/filebrowser/download/3265.

National Conference of State Legislatures (NCSL). (2021, August 13). State renewable portfolio standards and goals. NCSL. https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx

National Renewable Energy Laboratory (NREL). (2021). "PVWatts." https://pvwatts.nrel.gov/.

U.S. Environmental Protection Agency (EPA). (2021). "Emissions & generation resource integrated database (eGRID)." https://www.epa.gov/egrid.

San Bernardino Council of Governments (SBCOG). (n.d.) "SBCOG analysis: Warehouse data." SBCOG.

Strategy 4 Green roofs

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
Less than 10	Less than 10	0	0	Target area of residential green roofs installed in Ontario (square feet)	25,000	50,000	Installed square footage of residential green roofs in Ontario	25,000	50,000
				Target area of commercial green roofs installed in Ontario (square feet)	50,000	100,000	Installed square footage of commercial green roofs in Ontario	50,000	100,000

Sources:

San Bernardino County Transportation Authority (SBCTA). (2021). GHG reduction tool, San Bernardino County GHG reduction plan. SBCTA. https://www.gosbcta.com/plan/regional-greenhouse-gas-reduction-plan/.

California Energy Commission (CEC). (2019). Power content label 2019: Southern California Edison (SCE). CEC. https://www.energy.ca.gov/filebrowser/download/3265.

National Conference of State Legislatures (NCSL). (2021, August 13). State renewable portfolio standards and goals. NCSL. https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx

Strategy 5 Urban cooling

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
5,610	12,730	0.0140	0.0180	Total number of trees planted with urban forestry program	4,000	10,000	Number of trees planted	4,000	10,000

Sources:

California Air Pollution Control Officers Association (CAPCOA). (2021). Handbook for analyzing greenhouse gas emissions reductions, assessing climate vulnerabilities, and advancing health and equity. CAPCOA. https://www.airquality.org/ClimateChange/Documents/Handbook%20Public%20Draft_2021-Aug.pdf.

California Energy Commission (CEC). (2019). Power content label 2019: Southern California Edison (SCE). CEC. https://www.energy.ca.gov/filebrowser/download/3265.

National Conference of State Legislatures (NCSL). (2021, August 13). State renewable portfolio standards and goals. NCSL. https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx

USDA Forest Service. (2006). I-Tree planting calculator. I-Tree. https://planting.itreetools.org/.

Strategy 6 Energy efficiency retrofits for low-income households

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
940	1,440	0.0023	0.0020	Penetration rate for low-income residential energy efficiency retrofits	30%	60%	Number of retrofitted low-income homes	4,630	9,270
				Anticipated savings in electricity energy efficiency from retrofit activities	20%	20%			
				Anticipated savings in natural gas energy efficiency from retrofit activities	32%	32%			
				Percent of existing households in Ontario that are low income (2019)	27%	27%			

Sources:

California Air Pollution Control Officers Association (CAPCOA). (2021). Handbook for analyzing greenhouse gas emissions reductions, assessing climate vulnerabilities, and advancing health and equity. CAPCOA. https://www.airquality.org/ClimateChange/Documents/Handbook%20Public%20Draft_2021-Aug.pdf

California Energy Commission (CEC). (2021). "2019 Residential Appliance Saturation Study." CEC. https://www.energy.ca.gov/data-reports/surveys/2019-residential-appliance-saturation-study.

California Energy Commission (CEC). (2019). Power content label 2019: Southern California Edison (SCE). CEC. https://www.energy.ca.gov/filebrowser/download/3265.

National Conference of State Legislatures (NCSL). (2021, August 13). State renewable portfolio standards and goals. NCSL. https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx

U.S. Department of Housing and Urban Development (HUD). (2017). Comprehensive Housing affordability Strategy (CHAS). Office of Policy Development and Research (PD&R). https://www.huduser.gov/portal/datasets/cp.html#2006-2017_data.

Strategy 7 Energy efficiency retrofits

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
11,570	15,600	0.0288	0.0221	Penetration rate for residential energy efficiency retrofits	15%	30%	Number of retrofitted homes (excluding low-income households)	4,920	9,270
				Anticipated savings from residential energy efficiency retrofits	25%	25%			
				Penetration rate for nonresidential energy efficiency retrofits	5%	20%			
				Anticipated savings from nonresidential energy efficiency retrofits	40%	40%			
				Target penetration rate for residential LED	75%	95%	Square footage of retrofitted nonresidential space	7,525,540	30,102,170
				Target penetration rate for nonresidential LED	60%	80%			
				Percent electricity savings per LED light	75%	75%			

Sources:

California Air Pollution Control Officers Association (CAPCOA). (2021). Handbook for analyzing greenhouse gas emissions reductions, assessing climate vulnerabilities, and advancing health and equity. CAPCOA. https://www.airquality.org/ClimateChange/Documents/Handbook%20Public%20Draft_2021-Aug.pdf.

San Bernardino County Transportation Authority (SBCTA). (2021). GHG reduction tool, San Bernardino County GHG reduction plan. SBCTA. https://www.gosbcta.com/plan/regional-greenhouse-gas-reduction-plan/.

California Energy Commission (CEC). (2021). "2019 Residential Appliance Saturation Study." CEC. https://www.energy.ca.gov/data-reports/surveys/2019-residential-appliance-saturation-study.

California Energy Commission (CEC). (2019). Power content label 2019: Southern California Edison (SCE). CEC. https://www.energy.ca.gov/filebrowser/download/3265.

National Conference of State Legislatures (NCSL). (2021, August 13). State renewable portfolio standards and goals. NCSL. https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx

U.S. Department of Energy (DOE). (2020). Adoption of light-emitting diodes in common lighting applications. Office of Energy Efficiency & Renewable Energy. https://www.energy.gov/sites/default/files/2020/09/f78/ssl-led-adoption-aug2020.pdf.

Strategy 8 Smart growth and infill

Smart growth and infill is not a quantifiable strategy in Ontario. There are no measurable GHG gas reductions for this strategy. There are no assumptions or performance targets.

Sources:

California Air Pollution Control Officers Association (CAPCOA). (2021). Handbook for analyzing greenhouse gas emissions reductions, assessing climate vulnerabilities, and advancing health and equity. CAPCOA. https://www.airquality.org/ClimateChange/Documents/Handbook%20Public%20Draft_2021-Aug.pdf.

Strategy 9 Transit-Oriented Development

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
330	1,440	0.0008	0.0020	New TOD households' share of new citywide VMT	3%	5%	New housing units in TOD areas	410	3,200

Sources:

California Air Pollution Control Officers Association (CAPCOA). (2021). Handbook for analyzing greenhouse gas emissions reductions, assessing climate vulnerabilities, and advancing health and equity. CAPCOA. https://www.airquality.org/ClimateChange/Documents/Handbook%20Public%20Draft_2021-Aug.pdf.

PlaceWorks. (2021). TOP 2050, Buildout Projections: Demographic Forecast. PlaceWorks.

Hermann, P. & Hayes, J. (2022). Draft memorandum: The Ontario Plan Transportation Impact Assessment-Vehicle Miles Travelled (VMT). Fehr and Peers.

Strategy 10 Increase transportation ridership

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
27,980	31,450	0.0697	0.0445	Target participation rate in Commute Trip Reduction Program	4%	4%	Number of employees participating in commute trip reduction	6,780	11,840
				Percent of employees eligible for Commute Trip Reduction Program or ridesharing	80%	80%			
				Target participation rate in ridesharing program in suburban areas	4%	4%	Annual West Valley Connector ridership	25,927,840	25,927,840

Sources:

California Air Pollution Control Officers Association (CAPCOA). (2021). Handbook for analyzing greenhouse gas emissions reductions, assessing climate vulnerabilities, and advancing health and equity. CAPCOA. https://www.airquality.org/ClimateChange/Documents/Handbook%20Public%20Draft_2021-Aug.pdf.

California Air Resources Board (CARB). (2019). Emission Factors model (EMFAC), Emissions inventory tool. CARB. https://arb.ca.gov/emfac/emissions-inventory.

U.S. Census. (2019). Home area profile analysis. Longitudinal Employer-Household Dynamics (LEHD) OnTheMap. https://lehd.ces.census.gov/.

Omnitrans. (2022). Route 83 service frequency. Omnitrans. https://omnitrans.org/routes/route-83/

U.S. Census Bureau. (2019). Means of transportation to work, 2019 American Community Survey 5-year estimate data profiles. The Census Bureau. https://data.census.gov/cedsci/.

Hermann, P. & Hayes, J. (2022). Draft memorandum: The Ontario Plan Transportation Impact Assessment-Vehicle Miles Travelled (VMT). Fehr and Peers.

Strategy 11 Traffic signal synchronization and roadway management

Traffic signal synchronization is not a quantifiable strategy. There are no measurable GHG gas reductions for this strategy. There are no assumptions or performance targets.

Strategy 12 Community vehicle electrification

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
62,880	465,140	0.1565	0.6584	Penetration rate for electrification of municipal fleet	20%	40%	EVs in municipal fleet	130	260
				Estimated percentage of municipal vehicle fleet that is light-duty vehicles	80%	80%			
				Estimated percentage of municipal vehicle fleet that is heavy-duty vehicles	20%	20%	Light-duty EVs registered in Ontario	24,510	173,400
				Target for eVMT share of community wide VMT (light-duty)	15%	60%			
				Target for eVMT share of community wide VMT (heavy-duty)	10%	50%	Heavy-duty EVs registered in Ontario	1,490	14,450
				Target number of new charging stations	15	30	Number of new charging stations	15	30

Sources:

California Air Pollution Control Officers Association (CAPCOA). (2021). Handbook for analyzing greenhouse gas emissions reductions, assessing climate vulnerabilities, and advancing health and equity. CAPCOA. https://www.airquality.org/ClimateChange/Documents/Handbook%20Public%20Draft_2021-Aug.pdf.

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Strategy 13 Active transportation networks

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
1,800	3,840	0.0045	0.0054	Percentage of bicycle network completed by 2030 and 2050	25%	75%	Miles of newly-installed bike lanes	42	127
							Miles of newly-installed pedestrian improvements	4	12

Sources:

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Strategy 14 Vehicle idling

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
1,950	1,780	0.0049	0.0025	Compliance rate with idling ordinance	0.5	0.5	There are no performance metrics associated with this strategy		
				Reduction in idling time with ordinance	40%	40%			
				Percent of total fuel used when idling	6%	6%			
				Reduction in idling time with ordinance	40%	40%			

Sources:

San Bernardino County Transportation Authority (SBCTA). (2021). GHG reduction tool, San Bernardino County GHG reduction plan. SBCTA. https://www.gosbcta.com/plan/regional-greenhouse-gas-reduction-plan/.

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Strategy 15 Parking policy and event parking

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
2,230	8,110	0.0056	0.0115	Current parking price	$0.50	$0.50	Future parking price	$0.75	$1.25
				Future parking price	$0.75	$1.25			
				Default percentage of trips parking on the street	75%	75%			

Sources:

California Air Pollution Control Officers Association (CAPCOA). (2021). Handbook for analyzing greenhouse gas emissions reductions, assessing climate vulnerabilities, and advancing health and equity. CAPCOA. https://www.airquality.org/ClimateChange/Documents/Handbook%20Public%20Draft_2021-Aug.pdf.

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Strategy 16 Electrification of construction and landscaping equipment

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
4,810	26,020	0.0120	0.0368	Penetration rate of electrification of conventional construction equipment	20%	50%	Pieces of electrified construction equipment	320	1,360
				Penetration rate of electrification of conventional landscaping equipment	20%	50%	Pieces of electrified landscaping equipment	1,070	4,120

Sources:

San Bernardino County Transportation Authority (SBCTA). (2021). GHG reduction tool, San Bernardino County GHG reduction plan. SBCTA. https://www.gosbcta.com/plan/regional-greenhouse-gas-reduction-plan/.

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Strategy 17 Idling ordinance for construction equipment

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
40	100	0.0001	0.0001	Reduction in idling time with ordinance	40%	40%	There are no performance metrics associated with this strategy		
				Compliance rate with idling ordinance	50%	50%			

Sources:

San Bernardino County Transportation Authority (SBCTA). (2021). GHG reduction tool, San Bernardino County GHG reduction plan. SBCTA. https://www.gosbcta.com/plan/regional-greenhouse-gas-reduction-plan/.

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Strategy 18 Methane capture at landfills

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
22,410	57,370	0.0558	0.0812	Current methane capture rate	75%	75%	Methane capture rate	80%	85%
				Target for methane capture rate	80%	85%			

Sources:

San Bernardino County Transportation Authority (SBCTA). (2021). GHG reduction tool, San Bernardino County GHG reduction plan. SBCTA. https://www.gosbcta.com/plan/regional-greenhouse-gas-reduction-plan/.

California Air Pollution Control Officers Association (CAPCOA). (2021). Handbook for analyzing greenhouse gas emissions reductions, assessing climate vulnerabilities, and advancing health and equity. CAPCOA. https://www.airquality.org/ClimateChange/Documents/Handbook%20Public%20Draft_2021-Aug.pdf.

Strategy 19 Waste diversion

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
14,490	38,670	0.0361	0.0547	Waste diversion target (AB 939)	75%	85%	Estimated tons of solid waste diverted	267,010	532,190
				Waste diversion rate (BAU)	50%	50%			

Sources:

San Bernardino County Transportation Authority (SBCTA). (2021). GHG reduction tool, San Bernardino County GHG reduction plan. SBCTA. https://www.gosbcta.com/plan/regional-greenhouse-gas-reduction-plan/.

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Strategy 20 Construction and demolition waste recovery ordinance

Construction and demolition waste recovery is not a quantifiable strategy in Ontario. There are no measurable GHG gas reductions for this strategy. There are no assumptions or performance targets.

Strategy 21 Indoor water efficiency

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
4,580	2,540	0.0114	0.0036	Average reduction in indoor water use in new buildings	20%	40%	Total community water use (million gallons, excluding recycled water)	10,770	18,630
				Average reduction in outdoor water use in new buildings	40%	60%			
				Average reduction in water use in existing buildings	25%	50%	Total community wastewater generation (million gallons)	3,880	6,450
				Average reduction in wastewater generation in existing buildings	25%	50%			

Sources:

San Bernardino County Transportation Authority (SBCTA). (2021). GHG reduction tool, San Bernardino County GHG reduction plan. SBCTA. https://www.gosbcta.com/plan/regional-greenhouse-gas-reduction-plan/.

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Strategy 22 Water efficient landscapes and water recycling

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
3,400	0	0.0085	0	Percent increase in recycled water use	72%	145%	Recycled water use (million gallons)	4,390	6,240

Sources:

Ontario Municipal Utilities Company (OMUC). (2020). Urban water management plan. City of Ontario. https://www.ontarioca.gov/sites/default/files/Ontario-Files/Municipal-Utilities-Company/Final%20Draft%20Ontario%202020%20Ontario%20UWMP.pdf.

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Strategy 23 Water system and wastewater operations efficiency

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
150	0	0.0004	0	Efficiency improvement in water treatment and distribution system	10%	25%	Electricity use of water treatment and distribution system (kWh)	56,533,450	66,745,850

Sources:

San Bernardino County Transportation Authority (SBCTA). (2021). GHG reduction tool, San Bernardino County GHG reduction plan. SBCTA. https://www.gosbcta.com/plan/regional-greenhouse-gas-reduction-plan/.

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Strategy 24 Methane capture for wastewater treatment

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
960	2,280	0.0024	0.0032	IEUA wastewater methane capture rate	70%	85%	Methane capture rate at IEUA facilities	70%	85%

Sources:

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Strategy 25 Methane capture for dairy operations

GHG Reduction ($MTCO_2e$)		Per capita GHG reduction ($MTCO_2e$ per person)		Assumptions			Performance standards		
2030	2050	2030	2050	Description	2030	2050	Description	2030	2050
3,160	0	0.0079	0.0000	Dairies using manure management systems with methane capture	50%	100%	Heads of livestock on dairies with manure capture	3,520	0
				Methane capture rate of installed systems	86%	86%			

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Strategy 26 Climate change awareness and education

Climate change awareness and education is not a quantifiable strategy in Ontario. There are no measurable GHG gas reductions for this strategy. There are no assumptions or performance targets.

Strategy 27 Carbon sequestration

Carbon sequestration is not a quantifiable strategy in Ontario. There are no measurable GHG gas reductions for this strategy. There are no assumptions or performance targets.

Strategy 28 Green jobs

Carbon sequestration is not a quantifiable strategy in Ontario. There are no measurable GHG gas reductions for this strategy. There are no assumptions or performance targets.

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