DALLAS COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN

APRIL 2020

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COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN

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APRIL 2020

City of Dallas

ACKNOWLEDGEMENTS

Final staff recommendation subject to City Council approval.

The City of Dallas would like to thank the many members of the public who participated in the planning process by offering their time, ideas, concerns, suggestions and support. A special thanks to the business, educational, finance, local, state and federal agencies; neighborhood, environmental, and social justice organizations who participated in the CECAP Stakeholder Advisory Committee (SAC).

Additionally, City staff members from over 20 departments served on the Environmental Planning Task Force (EPTF) to allow effective coordination of this plan with other related City efforts. The insights, suggestions and direction provided was critical to the development of the plan herein, and so, was greatly appreciated. The list of participants in the SAC and EPTF is provided in Appendix A.

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COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN

ACRONYMS

AMI	Area Medium Income
AVF	Alternative Fuel Vehicles
BOAT	Building Officials Association of Texas
BTU	British Thermal Units
C40	C40 International Climate Leadership Group
CAP	Climate Action Plan
CBCA	City-Business Climate Alliance
CCTV	Closed Circuit Television
CDR	Capacity, Demand and Reserves
CECAP	Comprehensive Environmental & Climate Action Plan
CLIDE	Celebrating Leadership in Development Excellence
CLM	Commercial Load Management Program
CNG	Compressed Natural Gas
CO_2	Carbon Dioxide
COPD	Chronic Obstructive Pulmonary Disease
CRS	Community Rating System
CSA	Community Supported Agriculture
CURB	Climate Action for Urban Sustainability tool
DART	Dallas Area Rapid Transit
DCHHS	Dallas County Health & Human Services
DFW	Dallas-Fort Worth metropolitan area
DISD	Dallas Independent School District
DWU	Dallas Water Utilities
EEI	Environmental Education Initiative
EIA	US Energy Information Administration
ESCO	Electric Service Company
EPA	United States Environmental Protection Agency
EPTF	Environmental Planning Task Force
ERCOT	Electric Reliability Council of Texas
EV	Electric Vehicle
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
GHG	Greenhouse Gases
GPC	Global Protocol for Community-Scale GHG Emission Inventories
GPCD	Gallons per Capita Daily
HERS	Home Energy Rating System
HOA	Homeowners Association
HOV	High Occupancy Vehicle
ICLEI	International Council for Local Environmental Initiatives
IECC	International Energy Conservation Code
IPCC	International Panel on Climate Change
ISA	International Society of Arboriculture
kW	Kilowatt
kWh/yr	Kilowatt hour per year
LED	Light Emitting Diode
LEED	Leader in Energy and Environmental Design
LIHEAP	Low Income Home Energy Assistance Program
MaaS	Mobility as a Service
MGD	Millions of Gallons Per Day
MT CO_2e/yr	Metric Tons of carbon dioxide equivalent per year (measure of GHG)
MwH	Megawatt hours
NAAQS	National Ambient Air Quality Standards
NCTCOG	North Central Texas Council of Governments
NFIP	National Flood Insurance Program
NGO	Non-Governmental Organization
NOAA	National Oceanic & Atmospheric Administration
NWS	National Weather Service
NOx	Nitrogen Oxides
NZE	Net Zero Energy
OEQS	Office of Environmental Quality & Sustainability
PACE	Property Assessed Clean Energy program
PFAs	Per- and poly-fluoroalkyl substances
PID	Public Improvement District
PM2.5	Particulate Matter at 2.5 micrometers
PM10	Particulate Matter at 10 micrometers
POC	People of Color
PUCT	Public Utility Commission of Texas
REC	Renewable Energy Credit
RECO	Residential Energy Conservation Ordinance
REPS	Renewable Energy Portfolio Standards
ROW	Right of Way
SAC	Stakeholder Advisory Committee
SMP	Strategic Mobility Plan
SNAP	Supplemental Nutrition Assistance Program
SOV	Single Occupancy Vehicle
TCEQ	Texas Commission on Environmental Quality
TDEC	Delivery Technology Demonstration & Education Center
TERP	Texas Emissions Reduction Plan
TDM	Transportation Demand Management
TNC	Transportation Network Company
TNC	The Nature Conservancy
TOD	Transit Oriented Development
TTI	Texas A&M University Transportation Institute
TV	Television
TWDB	Texas Water Development Board
USACE	US Army Corps of Engineers
USDA	US Department of Agriculture
VOC	Volatile Organic Compound
VW	Volkswagen
WBCSD	World Business Council for Sustainable Development
WIC	Women, Infants & Children
WRI	World Resources Institute
ZNE	Zero Net Energy

"Dallas is a leader in reducing emissions and addressing climate and environmental risk with effective, equitable, and common-sense solutions."

LETTER FROM THE MAYOR

ERIC JOHNSON

Dallas is a dynamic and vibrant city that has always handled significant challenges with a collaborative approach and an indomitable spirit. And our city's problem-solving culture has been on full display as we have looked to address the effects of climate change. The City of Dallas released its first Comprehensive Environmental and Climate Action Plan (CECAP) on April 22, 2020 - the 50th anniversary of the first Earth Day - in recognition of the need for community-oriented and data-driven solutions to the environmental challenges we face as a city, a state, and a nation.

With equity and inclusion as core values, the CECAP proposes solutions that will improve our natural environment, our educational and economic outcomes, the affordability of our housing stock, and our transportation systems.

Through the goals and concrete actions outlined in the plan, Dallas can achieve significant and measurable reductions in carbon emissions, enhance environmental quality for our most vulnerable residents, and create a more sustainable infrastructure that can withstand the negative effects of climate change.

Our framework for this plan was based on equitable and inclusive community engagement. From the nascent stages of the CECAP's development, businesses worked closely with members of our city's environmental justice communities and public health sectors. I subsequently created the first Dallas City Council Environment and Sustainability Committee, which guided the CECAP to fruition. This process led to a balanced approach that addresses environmental issues while recognizing the city's economic needs and building on best practices currently in place among local businesses. As mayor, I have greatly appreciated the teamwork and dedication demonstrated by all those who worked on the CECAP, which incorporates the ambitious goals of the Paris Agreement and works to preserve the city that our children will inherit. This plan will help the City of Dallas continue to serve as a global leader in efforts to reduce emissions and improve our air quality. I look forward to working collaboratively on the CECAP's implementation to ensure Dallas continues to thrive in the decades to come.

EXECUTIVE SUMMARY

THE CHALLENGES:

Extreme heat and more frequent and severe storms

Dallas is already experiencing the impacts of climate change—from droughts and heatwaves to more frequent floods. By 2050, Dallas is likely to suffer **30 to 60 more days with temperatures over 100°F.** Of all U.S. states, Texas is estimated to have the highest increase in electricity demand by mid-century; heat-related labor productivity will decline across all sectors in Texas and will likely **cost the economy up to $12.5 billion statewide each year,** with a 1-in-20 likelihood of costing more than $19.6 billion annually.

Everyone will be affected but not everyone will be affected equally

Vulnerable populations are most at risk to the impacts of climate change due to existing social, economic and environmental barriers. Low income households are more likely to live in poor quality homes and less able to afford repairs and improvements after weather-related damage. Children and the elderly are at greater risk of illness during heatwaves because they are less able to regulate their body temperatures and are more sensitive to air quality excursions. **Extreme heat can cause or aggravate negative health impacts** including respiratory and cardiovascular disease, mental health challenges and loss of life.

Based on the Dallas' 2015 Dallas' greenhouse gas (GHG) inventory, 64% of emissions come from the buildings and energy sectors and 35% from the transportation sector

To avoid the worst impacts, communities across the planet need to limit the increase in global temperatures to below 1.5°C. To achieve this, the Intergovernmental Panel for Climate Change (IPCC) recommends reducing GHG to net zero by 2050. In meeting this target, **The City, residents and businesses will need to work together** to focus on addressing emissions from these three sectors.

SELECT ANY ICON TO SKIP DIRECTLY TO THAT GOAL

8 GOALS AND CORRESPONDING OBJECTIVES:

DALLAS' BUILDINGS ARE ENERGY-EFFICIENT AND CLIMATE RESILIENT.

Increase energy efficiency of existing buildings or facilities.

Ensure that new buildings are constructed sustainably and are carbon neutral.

Increase climate resilience for new and existing buildings through structural and operational improvements.

DALLAS GENERATES AND USES RENEWABLE, RELIABLE, AND AFFORDABLE ENERGY.

Maintain a high degree of reliability during extreme weather events.

Encourage investment in, and greater use of, renewable energy.

Ensure affordable access to renewable electricity.

DALLAS' COMMUNITIES HAVE ACCESS TO SUSTAINABLE, AFFORDABLE TRANSPORTATION OPTIONS.

Shift the surface transportation system to move people and goods in fuel-efficient vehicles.

Reduce trips where people drive alone.

Synergize jobs and housing with transportation infrastructure to increase access to walking and biking options, and public transit.

Ensure that walking, biking, public transit, vehicular transportation infrastructure is reliable and safe under all weather conditions.

DALLAS IS A ZERO WASTE COMMUNITY.

Create opportunities to go beyond recycling and choose to refuse, reduce, reuse and repair.

Operate a clean, green and efficient waste system.

Generate energy from organics.

DALLAS PROTECTS ITS WATER RESOURCES AND ITS COMMUNITIES FROM FLOODING AND DROUGHT.

Conserve and protect our water resources through community stewardship, educational programs and best management practices.

Protect neighborhoods from flooding and prepare them for droughts.

Be a regional leader in water resilience by leveraging innovative approaches, strategies and technologies.

DALLAS PROTECTS AND ENHANCES ITS ECOSYSTEMS, TREES AND GREEN SPACES THAT IN TURN IMPROVE PUBLIC HEALTH.

Leverage green spaces to provide climate adaptation benefits .

Increase, enhance and maintain healthy forests, parks, and green spaces.

Integrate nature-based solutions into the public realm as a public health strategy.

ALL DALLAS' COMMUNITIES HAVE ACCESS TO HEALTHY, LOCAL FOOD.

Build organizational capacity and partnerships around an urban agriculture network.

Improve food access in neighborhoods with low food access.

Reduce food miles by encouraging local food production and consumption.

Prepare the food system to be more resilient to extreme weather events.

Prevent food waste through food donations, recovery, diversion and composting.

ALL DALLAS' COMMUNITIES BREATHE CLEAN AIR.

Take a comprehensive approach to addressing air quality at the neighborhood level.

Increase energy efficiency of existing buildings or facilities.

Reduce trips where people drive alone.

Synergize jobs and housing with transportation infrastructure to increase access to walking and biking options, and public transit.

Increase, enhance and maintain healthy forests, parks, and green spaces, that improve air quality.

Operate a clean, green and efficient waste system.

COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN

EXECUTIVE SUMMARY

CHALLENGES AND APPROACH

Dallas residents are familiar with Texas' extreme weather—from flooding and storms, to heatwaves and drought. By 2050, Dallas is likely to experience a 5° F increase in mean temperature during summer months if global greenhouse gas emissions continue to increase. Climate models also predict a decrease in overall annual precipitation, and an increase in the frequency, intensity, and length of severe droughts. Over the next few decades, seasonal swings in weather will be extreme, with colder, wetter winters and hotter, dryer summers. Climate change will impact every part of daily life in Dallas. Climate change will also impact the sensitive urban ecosystem balances that provide food, water and habitat to plant, animal and human life. The Federal Reserve Bank of Dallas estimates that:

"Severe weather events can have a substantial human and economic cost and are likely to have a negative impact on the region's longer-term business prospects and migration trends."

Climate change will affect everyone, but not everyone will be affected equally—the effects of climate change will disproportionately impact communities with the least means to adapt, and who have been burdened with negative historic environmental impacts. These vulnerable communities are predominantly located in the southern and western sectors of Dallas. The City recognizes environmental injustices of the past and elevates solutions to address them, placing equity at the center of this effort towards a more resilient future.

The City of Dallas is committed to meeting the international emission reduction targets set by the Paris Agreement in 2016 and the goal to keep warming at or below 1.5 degrees Celsius. In 2017, Mayor Rawlings signed the Climate Mayors' National Climate Agreement in support of the Paris Agreement. In 2019, Mayor Johnson re-affirmed the City's ongoing commitment to protecting the community from the impacts of climate change and supporting measures to reduce GHG emissions.

DALLAS' CONTRIBUTION TO GLOBAL EMISSIONS

The City prepared a 2015 communitywide GHG inventory to be used as the basis for emissions forecasting in the Comprehensive Environmental and Climate Action Plan (CECAP). The inventory outlines the volume and sources of GHG emissions within Dallas and serves as a reference point for appropriate emissions reduction pathways to achieve our targets.

The 2015 inventory was prepared according to the Global Protocol for Community Scale GHG Inventories (GPC), an internationally accepted protocol developed by the C40 Cities Climate Leadership Group (C40), the World Bank, ICLEI-Local Governments for Sustainability (ICLEI), and World Resources Institute (WRI). The inventory was based on calculations to estimate emissions using a combination of activity data and emissions factors. The results are expressed in metric tons of carbon dioxide equivalent (MT CO_2e), that allow emissions of different greenhouse gases to be compared as a single unit. Dallas' 2015 emissions inventory totals 19,529,600 MT CO_2e/year, which is approximately 15 MT CO_2e per person per year. Buildings and energy form the largest contributor of GHG emissions in the city (64%), with transportation contributing most of the remainder (35%), meaning that local emissions reduction efforts will need to focus on these two sectors. The waste sector (including wastewater) is responsible for the remaining <1% of emissions.

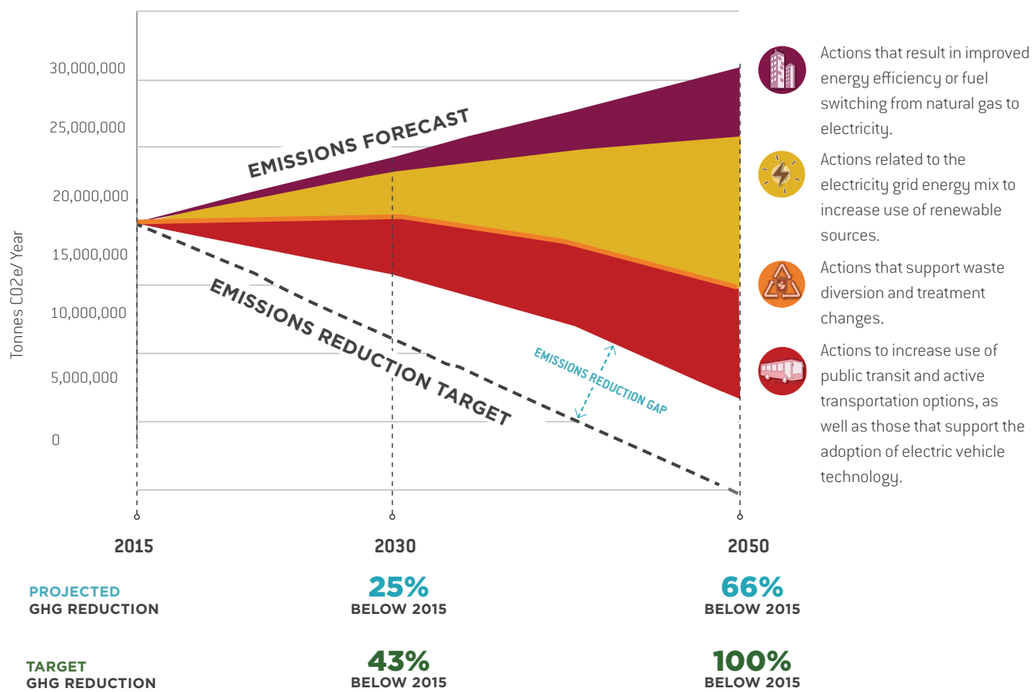


Figure i: GHG emissions forecast and reduction targets

Source: AECOM 2020

ACHIEVING OUR TARGETS

Consistent with other Texas cities and the goals of the Paris Climate Agreement, the City selected targets of reducing GHG emissions by 43% by the year 2030, and 100% by the Year 2050. The CECAP comprises 97 actions across eight sectors, of which 45 are aimed primarily at reducing GHG emissions.
The GHG reduction estimates for the suite of actions in this plan were modeled using the CURB tool, which estimates GHG reductions from implementing technological approaches (e.g., switching from incandescent bulbs to LEDs, transitioning from gas-powered passenger vehicles to electric vehicles).

This modeling was based on assumptions about the fuel makeup of the electrical grid that is fueled primarily by natural gas and coal-fired power plants (2019 data) and current predictions of how the grid fuel mix will evolve between now and 2050 (based on ERCOT projections through 2030 and U.S. EIA projections through 2050). Because of this, the modeled actions within the CECAP are anticipated to achieve reductions of GHG emissions by 25% in 2030 and 66% by 2050, respectively. An adaptive management approach to implementation will be adopted, to allow adjustment of both the grid mix and the actions, as necessary to continue towards this important goal.

COMMUNITY OUTREACH AND ENGAGEMENT

The CECAP was developed by the City of Dallas in partnership with a broad and diverse community. Outreach efforts included formal community meetings held over several months across the City, over 180 individual meetings with community groups per their request, two surveys, campaigns on multiple social media platforms, and a website that facilitated public information sharing, input and transparency concerning this effort. Staff met one-on-one with over 6,000 people and attained over 9,000 individual comments and suggestions for the plan. More importantly, this input was received from every single zip code in Dallas.

Additionally, two stakeholder groups were convened to advise the City on outreach, vision, goals and objectives, and actions for the plan. Community members with a wide range of perspectives including public agencies, education, business, and social and environmental advocacy groups were convened as one Stakeholder Advisory Group. A separate Environmental Planning Task Force was convened of City staff from over 20 departments with roles in implementing the actions proposed in this plan.

230 CECAP EVENTS

6000+ COMMUNITY PARTICIPANTS

9000+ COMMUNITY SUGGESTIONS

THE COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN

In combination with public and stakeholder input, relevant best practices from peer and aspirational cities, and other international standards informed recommendations for the plan. To screen actions for the CECAP, equity considerations, relative costs, and both disadvantages and advantages of each action were evaluated. The CECAP is a comprehensive roadmap that outlines specific activities that the City plans to undertake to improve quality of life for all residents, to reduce greenhouse gas emissions, to prepare for the impacts of climate change, and to create a healthier and more prosperous community.

The suite of actions in the plan has been carefully selected to include mitigation, adaptation and environmental quality and justice activities to start Dallas on a positive path towards achieving carbon neutrality by 2050.

Actions were evaluated on their potential to deliver a range of co-benefits, including social equity, economic, health, mitigation, environmental quality and adaptation. The goals are ambitious, but actionable, and have defined metrics for success.
Given this is Dallas' first climate action plan, and to encourage buy-in and broad participation of the CECAP from businesses and residents, the City has chosen a phased approach to implementation over time. The plan contains educational programs and incentives to inspire action and to allow time to build institutional capacity, develop public-private sector partnerships and build community support to create momentum for voluntary updates of actions while laying the groundwork for more impactful and transformational actions in the future.

The City will form a new Environment and Sustainability Advisory Committee to assist with implementation across all sectors and concerned departments. In addition, the City will continue to work with the Environmental and Sustainability Committee established by Mayor Johnson and with the Regional Climate Coalition. The City of Dallas recognizes the importance of the actions included in this CECAP and is dedicated towards timely and effective implementation. We will be relying on residents, businesses and institutions to work together towards this effort.

Figure ii: The intersection between mitigation, adaptation, and environmental quality

Source: AECOM 2020

Credit: 350Dallas

01
Background

01

INTRODUCTION

In January 2019 the Dallas City Council approved the Dallas Climate Resolution that directed staff to develop an effective, actionable climate plan. Per this resolution, the Comprehensive Environmental and Climate Action Plan (CECAP) is to build upon existing planning efforts, to benchmark against other U.S. city climate planning efforts, be generally consistent with national and international climate planning protocols, include a robust community engagement effort, and outline a series of actions to reduce greenhouse gas emissions, help the community adapt to a climatically different future, and comprehensively enhance environmental quality across Dallas. The CECAP is organized into three sections:

Section 01 outlines the purpose and approach of the CECAP, introduces Dallas' climate and environmental challenges and outlines the potential impacts of current and future climate projections. This section discusses Dallas' greenhouse gas emissions, forecasts, targets, and provides an estimate of the GHG reductions provided by the actions in this plan.

Section 02 summarizes the eight sector goals including buildings, energy, transportation, solid waste, water resources, ecosystems and green space, food and urban agriculture, and air quality. For each goal, a brief introduction is provided, outlining existing environmental issues and the impact(s) that climate change will have on the sector. Examples of current initiatives that address these issues are showcased, and suggestions for how residents and businesses can get help are provided. Finally, for each goal, actions developed in the planning process are listed with details.

Section 03 discusses how the plan will be implemented and highlights the City's immediate next steps.

The CECAP is a comprehensive roadmap that outlines the activities that the City will undertake to improve quality of life, to reduce greenhouse gas emissions, to prepare for the impacts of climate change, and to create a healthier and more prosperous community. It builds upon our understanding of future impacts from climate change, other environmental challenges facing Dallas, and the data from the 2015 City of Dallas greenhouse gas inventory. The CECAP leverages existing efforts by the City and builds upon an active public outreach and engagement effort to solicit input from businesses, community organizations, residents, and stakeholders, to create an effective and equitable Dallas plan that everyone can implement.

In 2017, former Mayor Michael Rawlings signed the U.S. Climate Mayors pledge along with six other Texas mayors to meet the international emissions reduction targets set by the Paris Agreement.

Upon election in 2019, Mayor Eric Johnson reiterated the City of Dallas' commitment towards leadership in efforts to reduce emissions and improve air quality in Dallas. He also directed staff to build upon collective efforts and to focus on common sense, data-driven solutions to ensure that Dallas continues to thrive in the decades to come. The City of Dallas has committed to achieving carbon neutrality by 2050, joining some of the most ambitious US cities towards addressing climate change.
The CECAP meets one Paris Agreement goal of having a Climate Plan in place by 2020. While this is the first climate action plan that the City has developed, the plan is founded upon decades of City of Dallas planning and environmental leadership, and comprehensively builds upon ongoing actions compiled from over 20 existing planning documents. A list of these baseline documents is included on **p.35-36**.

The CECAP directly follows the ***Resilient Dallas Plan***, completed in 2018 under a grant from the Rockefeller Foundation, that enabled the initial data compilation critical to the timely development of the CECAP. The Resilient Dallas Plan identifies seven different goals to build community resiliency towards handling social, economic, and environmental shocks and stressors. The CECAP forms the logical next step towards building resilience for the environmental reality posed by a changing climate, and the potential impacts this may have on the community fabric.

Two primary goals from the Resilient Dallas Plan that provide direction for the CECAP are:

Goals from Resilient Dallas:

GOAL 6
INVEST IN NEIGHBORHOOD INFRASTRUCTURE TO REVITALIZE HISTORICALLY UNDERSERVED NEIGHBORHOODS

- *Recognize and institutionalize the need for a multi-pronged, coordinated, place-based approach and the long-term commitment necessary to achieve holistic revitalization in low- and moderate-income neighborhoods.*

GOAL 7
PROMOTE ENVIRONMENTAL SUSTAINABILITY TO IMPROVE PUBLIC HEALTH AND ALLEVIATE ADVERSE ENVIRONMENTAL CONDITIONS

- *Support and leverage the leadership of academic institutions, nonprofit organizations, and philanthropic foundations working to fill science and data gaps to bring best practices to Dallas and North Texas.*
- *Promote partnership efforts to implement green infrastructure projects in neighborhoods disproportionately vulnerable to the impacts of the urban heat island effect, poor water quality, and poor air quality.*

Resilient Dallas Strategy
(City of Dallas, 2019)

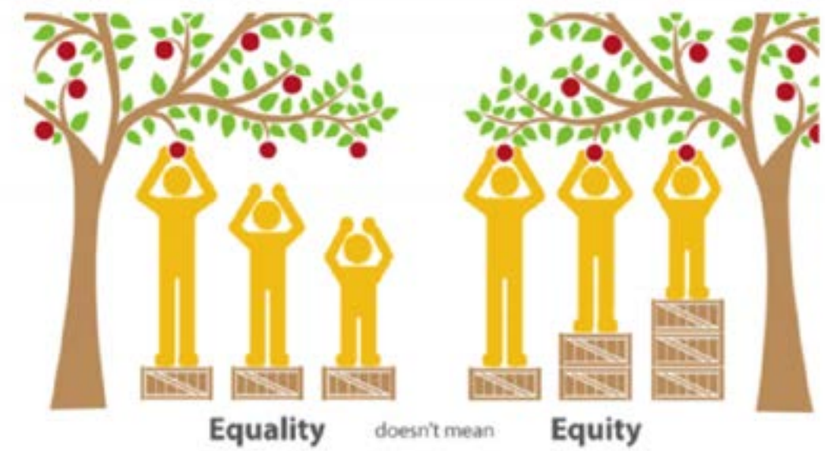


Figure 1: Equality versus Equity
Source: Office of Health Equity, Maine 2016

Equity and equality are often used interchangeably, but equity and equality do not mean the same thing. Equality is about sameness—meaning that everyone receives the same thing regardless of any other factors. However, equality is only useful if everyone starts from the same place, which is often not the case. Lower income populations and communities of color often have less access to adequate and energy efficient housing, transit, or safe bicycling and walking routes.

Equity, on the other hand, is about fairness, which is about ensuring that people have access to the same opportunities and have what they need to thrive and succeed. Equity is needed before equality can be reached. This understanding recognizes that people may have different starting points and may need different types and levels of support to flourish.

Guide to Equitable, Community-Driven Climate Preparedness Planning
(The Urban Sustainability Directors Network, 2019)

AN EQUITABLE APPROACH TO CLIMATE ACTION

Climate change will affect everyone, but not everyone will be affected equally—the effects of climate change will disproportionately impact communities with the least means to adapt, and who have been burdened with negative environmental impacts due to institutionalized discriminatory practices.

The CECAP recognizes the environmental injustices of the past and elevates solutions to address them, thereby placing justice at the center of this effort towards a more resilient and equitable future. The CECAP builds on previous City efforts to engender equity through actions that address both environmental quality and justice. The principles of equity shaped the development of the plan's vision, the engagement process, the development of actions, and will influence plan implementation.

Community engagement efforts focused on increasing access to information for communities that have not historically been engaged in planning processes, while also providing a range of opportunities for a broad audience to provide input. This was done by bringing information to people, rather than solely relying on residents' availability during formal CECAP meetings (although those were an option, too). The information was delivered in various formats—at in-person events, and online through live-streamed meetings and social media. Neighborhoods of southern and western Dallas were prioritized, and participation was encouraged, both directly and through partnerships with trusted community partners. The City will continue to work with vulnerable neighborhoods through implementation to ensure the CECAP efforts lead to equitable outcomes.

The CECAP Stakeholder Advisory Committee (SAC) was convened to reflect a diverse group of voices including representatives of public health, education, environmental justice, housing, neighborhoods, public agencies, and large and small business organizations. A full list of participating organizations is provided in **Appendix A.** During implementation of outreach and engagement, a SAC community engagement sub-committee was formed to help re-focus the outreach and engagement methods, materials and implementation to improve engagement. **Figures 2 and 3** illustrates participation in the community engagement process across the city. As shown, meetings were held throughout the city, and plan input was provided by residents from all Dallas zip codes.

PLAN PROCESSS

The focus areas, goals, objectives, and actions included in this plan were shaped by two formal rounds of community input, numerous informal meetings at community request, City staff and stakeholder input, relevant best practices from peer and aspirational cities, and other international standards. To develop actions for the CECAP, the disadvantages (exposure to harm), advantages (access to opportunity) and equity considerations of each action were assessed. Actions were evaluated on their potential to deliver a range of co-benefits, including social equity, economic, health, mitigation, environmental quality, and adaptation.

During implementation, programs and initiatives described in the actions may be initiated through pilot programs, to focus on vulnerable communities or communities most affected by environmental challenges. Performance will be evaluated based on metrics, to include new and existing equity indicators developed for the City of Dallas.

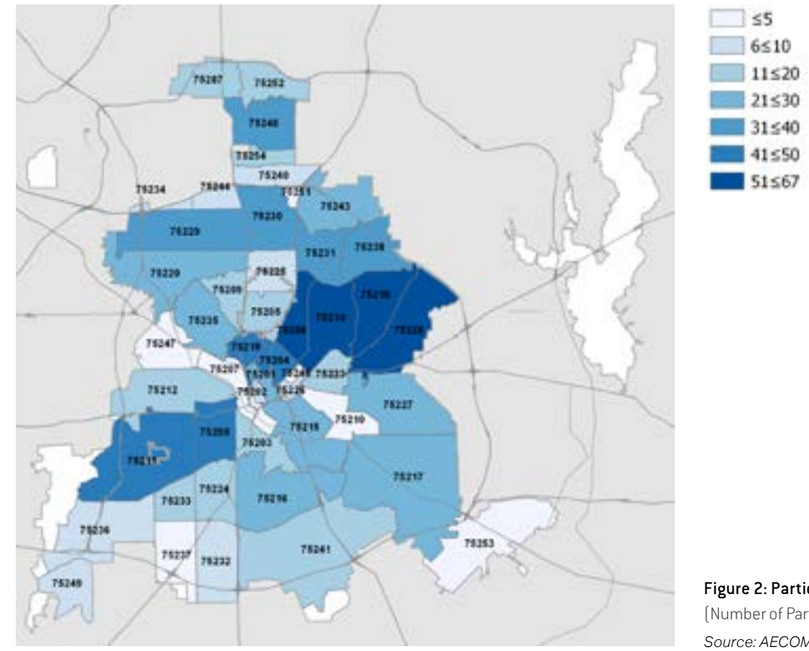


Figure 2: Participation by zip code
(Number of Participants Spring 2019)
Source: AECOM 2020

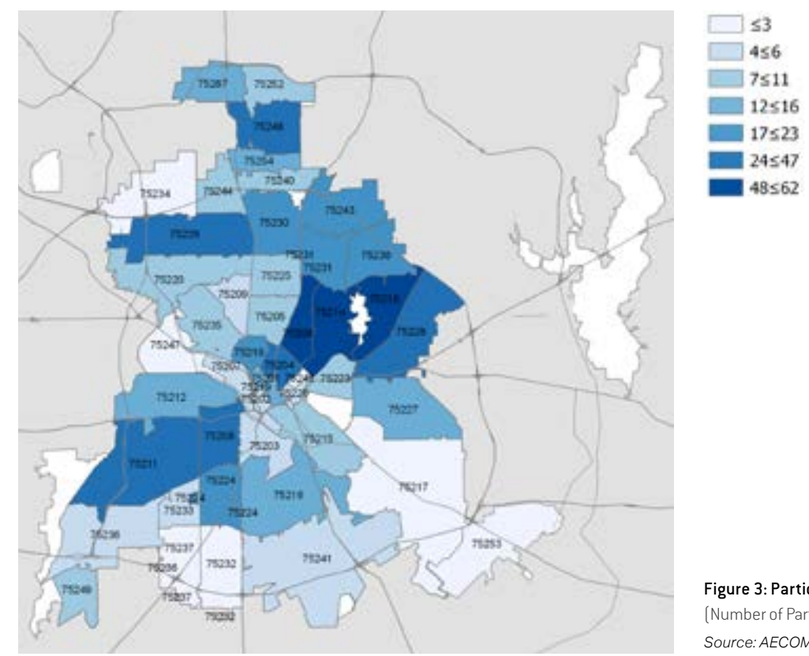


Figure 3: Participation by zip code
(Number of Participants Fall 2019)
Source: AECOM 2020

COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN

TIMELINE OF CITY ENVIRONMENTAL INITIATIVES

The CECAP was developed as a part of larger focus on citywide environmental planning and actions, shown on this timeline.

2008

Green Building Ordinance

City Council adopted an ordinance that required all new buildings to meet higher efficiency standards that existing building energy codes.

2014

Building Ordinance update

City Council updated the Green Building ordinance to meet the minimum requirements of the Green Construction Code.

2015

100% Renewable Energy

City purchased renewable energy for all facilities

2016

Air Quality Resolution

Quality of Life Committee briefed on air quality and resolution of support subsequently passed

2017

Emissions initiative

City of Dallas Transportation and Infrastructure Committee was briefed on air quality and an emissions reduction initiative was passed.

2018

Resilient Dallas Strategy

Resilient Dallas Strategy completed by Office of Resilience and adopted by City Council.

1st North Texas Climate Symposium

2019

Green Energy Policy

City Council approves Green Energy Policy requiring 100% renewable energy, an Energy Management System for City facilities, and development of on- and off-site renewable power generation.

Water Conservation Plan

Plan completed by Dallas Water Utilities, and adopted by City Council

CECAP INITIATED

JANUARY
Climate change resolution adopted

Drought Contingency

Plan completed by Dallas Water Utilities, and adopted by City Council

2nd North Texas Climate Symposium

2020

Strategic Mobility Plan

Transportation Department
Status Underway

3rd North Texas Climate Symposium

2021

CECAP ADOPTED

MAY
Plan adopted and plan implementation initiated

Urban Forest Master Plan

Office of Environmental Quality + Sustainability
Status Underway

Comprehensive Plan

Planning + Urban Development
Status Underway

Urban Agriculture Plan

Office of Environmental Quality + Sustainability
Status Underway

GHG Inventory Update

2020 GHG inventory will be completed and updated every 3 years.

2022

CECAP UDPATES

The plan will be reviewed annually and updated every 3 years

Drainage Inventory

Dallas Water Utilities
Status Initiation in 2021

Zero Waste Plan update

Sanitation Services
Status Initiation in 2021

Bus Route Optimization

DART
Status Underway

Related Sector

- Buildings
- Energy
- Transportation
- Waste
- Water
- Ecosystems
- Food + Agriculture
- Air Quality

COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN

CECAP DEVELOPMENT + ENGAGEMENT HIGHLIGHTS

06 FORMAL COMMUNITY MEETINGS

178 INFORMAL CECAP EVENTS

941 RESIDENTIAL SURVEY RESPONSES

60 BUSINESS SURVEY RESPONSES

6400 COMMUNITY SUGGESTIONS

CECAP DRAFT PUBLIC REVIEW:

366 COMMENTS THROUGH ONLINE FORUM

08 LETTERS FROM RESIDENTS AND ORGANIZATIONS

2019 FEBRUARY — SAC + EPTF WORKSHOP

APRIL

MAY — SAC + EPTF WORKSHOP 2

SEPTEMBER — SAC + EPTF WORKSHOP 3

DECEMBER — SAC + EPTF WORKSHOP 4

2020 FEBRUARY — SAC + EPTF WORKSHOP 5

MAY — PLAN ADOPTION

DEVELOP VISION + GOAL → DEVELOP ACTIONS → FINALIZE ACTIONS + PLAN → IMPLEMENT PLAN

2nd North Texas Climate Symposium

06 FORMAL COMMUNITY MEETINGS

40 INFORMAL CECAP EVENTS

1235 SURVEY RESPONSES

3000+ COMMUNITY SUGGESTIONS

MEETING IN A BOX:
Community members hosted their own meetings and used the CECAP social media toolkit to raise awareness.

3rd North Texas Climate Symposium

SAC - STAKEHOLDER ADVISORY COMMITTEE
EPTF - ENVIRONMENTAL PLANNING TASK FORCE

01

ENVIRONMENTAL + CLIMATE CHALLENGES

OUR CHANGING CLIMATE

Dallas residents are familiar with Texas' extreme weather—from storms and flooding to heatwaves and drought. Climate change is expected to exacerbate the currently variable conditions. Following the catastrophic 2015 impacts of unprecedented month-long heavy rainfall in the Upper Trinity River basin, 2016 flooding in the Hill Country, and 2017 Hurricane Harvey along the Texas Coast,

the Texas Governor's Office implemented a task force to review flood conditions, and to provide recommendations for how to "future proof" the state.

Figure 4 is from the Governor's task force report and illustrates the concern posed by increased flood losses in areas located outside of the regulated floodplain (illustrating just how much it is flooding in areas that are not anticipated to be flood prone). This graph shows a marked increase in unexpected flooding in the period from 1986 to 2014.

As part of the Southern Great Plains region outlined in Chapter 23 of the National Climate Assessment[1] Texas is anticipated to experience wide extremes in weather. By 2050, Dallas is likely to experience a 5°F increase in mean temperature during summer months, especially if global greenhouse gas emissions continue to increase. In climate models, this is referred to as the "high emissions scenario." Temperatures during the summer are already frequently over 100°F, and by the middle of this century, Dallas is likely to experience 30-60 more days over 100°F. These heat waves will be more frequent, hotter, and longer than the previous historic heat events. Not only does this pose a health threat by heat stroke and other heat-related illnesses, but it also creates stagnant air conditions, resulting in poor air quality, an issue already impacting parts of Dallas.

In cities, this heat can be exacerbated through the urban heat island effect, which develops in urban or metropolitan areas due to impermeable, dry, dark surfaces such as roads and buildings. Dallas' urban heat island is increasing at the second highest rate in the nation (second to Phoenix). The urban heat island effect is strongest in areas with few trees or green spaces such as downtown, along the I-35 corridor in the northeast, and between the Trinity River Greenbelt and I-30.

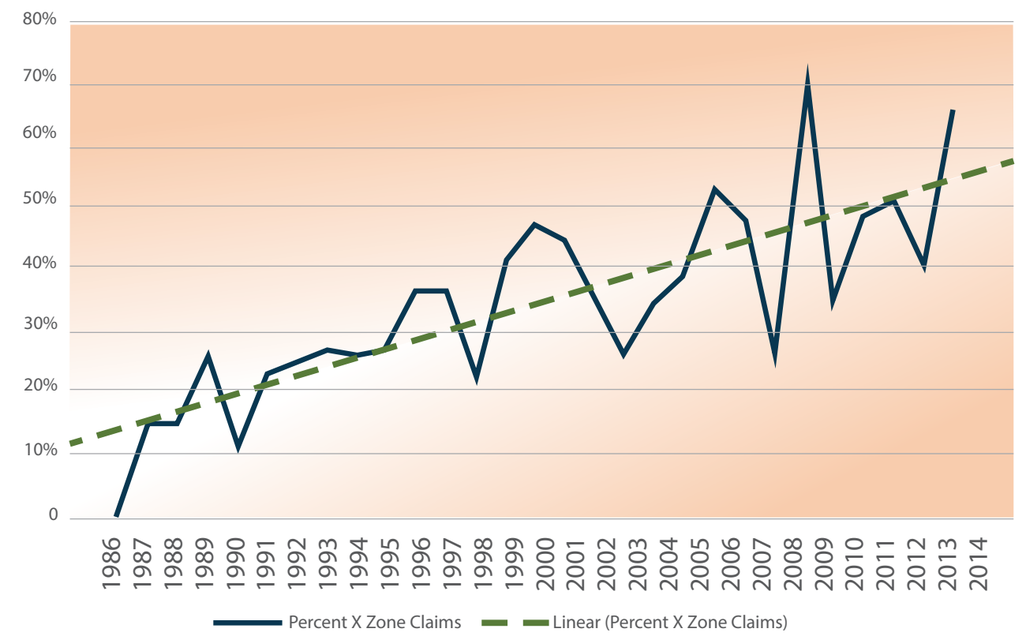


Figure 4: Share of total insured flood losses outside Texas floodplains
(X Zone claims are those that occur outside of the regulatory floodplain)
Source: Texas Governor's Task Force 2018

Climate models also predict a decrease in overall annual precipitation and an increase in the frequency, intensity, and length of severe droughts. Over the next few decades, seasonal swings in weather will be extreme, with colder, wetter winters and hotter, dryer summers. Most of the rainfall will occur during the spring in heavy precipitation events, which could cause increased flooding.

Climate change will impact every part of daily life in Dallas. Key impacts on people, the environment and the economy are highlighted on the following pages, and specific impacts on key infrastructure sectors such as buildings, energy, and transportation are described later in the plan alongside actions that are being proposed for addressing those impacts.

IMPACTS ON PEOPLE

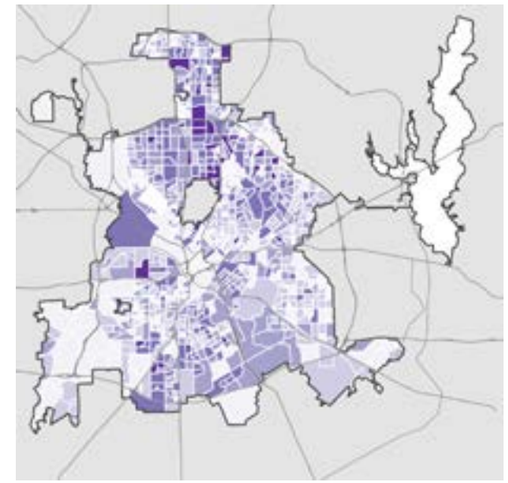
Vulnerable populations are most at risk to the impacts of climate change due to existing social and economic barriers and sensitivity to environmental hazards. Factors that increase climate vulnerability include income, living conditions, age, location, occupation, health and language barriers.[2] Low income households are more likely to live in poor-quality homes and less able to afford improvements after weather-related damage. Children and the elderly are at greater risk of illness during heatwaves because they are less able to regulate their body temperatures and are more sensitive to changes in air quality, which worsens with the rise in temperature.

Figures 5 to 8 show census blocks in Dallas with higher concentrations of low-income communities, communities of color, elderly residents, and children. There is a substantial overlap between low income communities and communities of color in Dallas due to sustained, historic underinvestment in these neighborhoods. These communities are primarily in the southern and western sectors of Dallas.

Extreme heat can cause negative health impacts and aggravate existing conditions including respiratory and cardiovascular disease, mental health challenges, and loss of life. During May to September 2011, there were 112 heat-related deaths in Dallas.[3] Severe weather events also pose a risk to healthcare facilities. During the aftermath of Hurricane Harvey, 15 hospitals had to evacuate their patients due to power outages and suffered shortages of medication after deliveries could not be made.

Figures 9 to 12 (overleaf) illustrate vulnerable communities at risk to increased heat and flood.

COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN



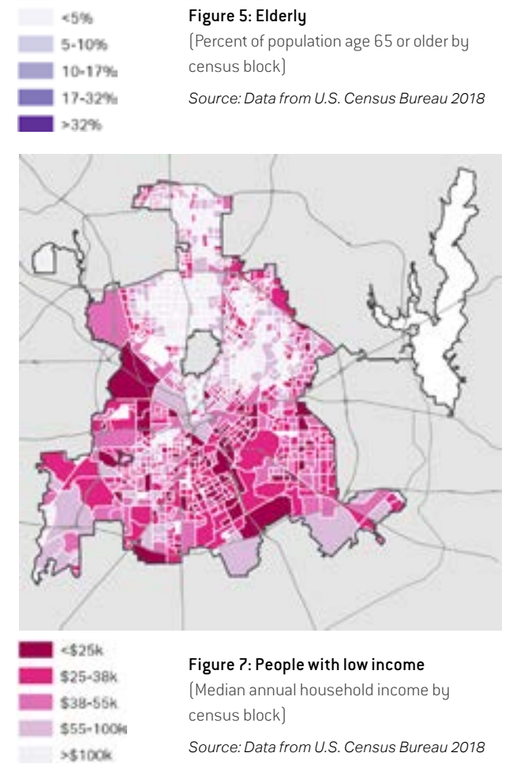
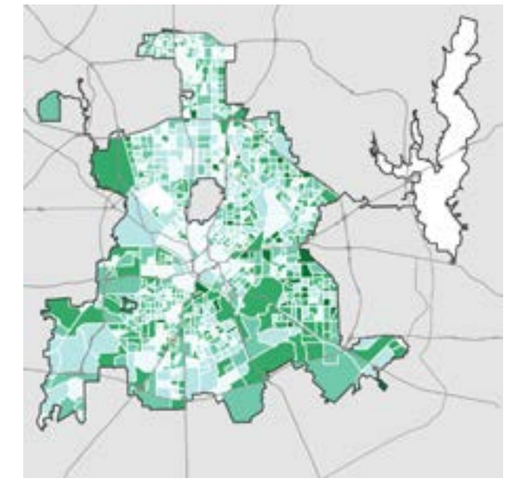


Figure 5: Elderly
(Percent of population age 65 or older by census block)
Source: Data from U.S. Census Bureau 2018



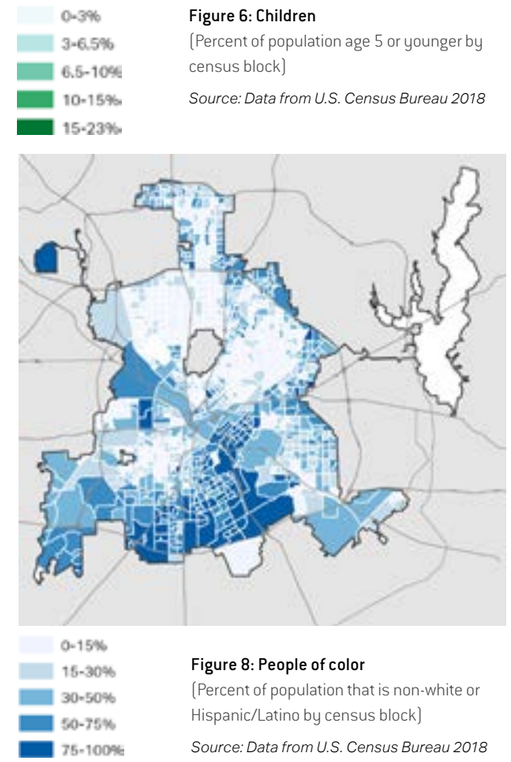


Figure 6: Children
(Percent of population age 5 or younger by census block)
Source: Data from U.S. Census Bureau 2018

Figure 7: People with low income
(Median annual household income by census block)
Source: Data from U.S. Census Bureau 2018

Figure 8: People of color
(Percent of population that is non-white or Hispanic/Latino by census block)
Source: Data from U.S. Census Bureau 2018

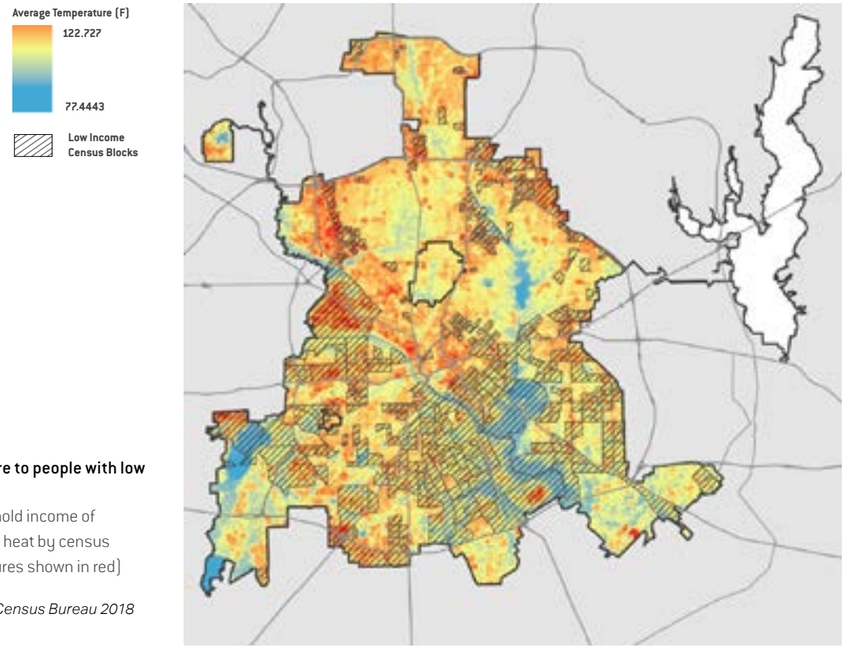


Figure 9: Heat exposure to people with low income
(Median annual household income of $38,000 or less versus heat by census block; higher temperatures shown in red)

Source: Data from U.S. Census Bureau 2018 and NASA 2016

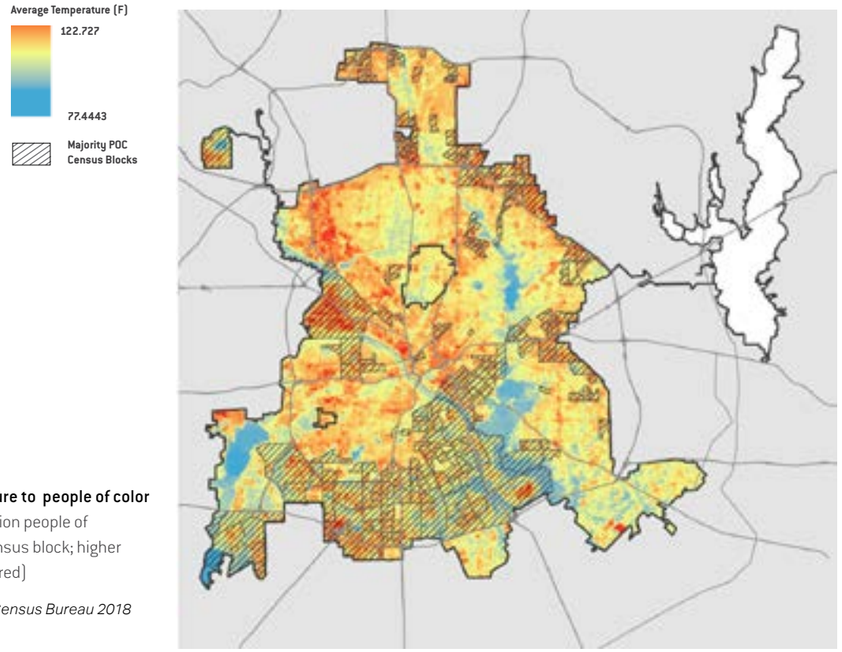


Figure 10: Heat exposure to people of color
(50% or more of population people of color versus heat by census block; higher temperatures shown in red)

Source: Data from U.S. Census Bureau 2018 and NASA 2016

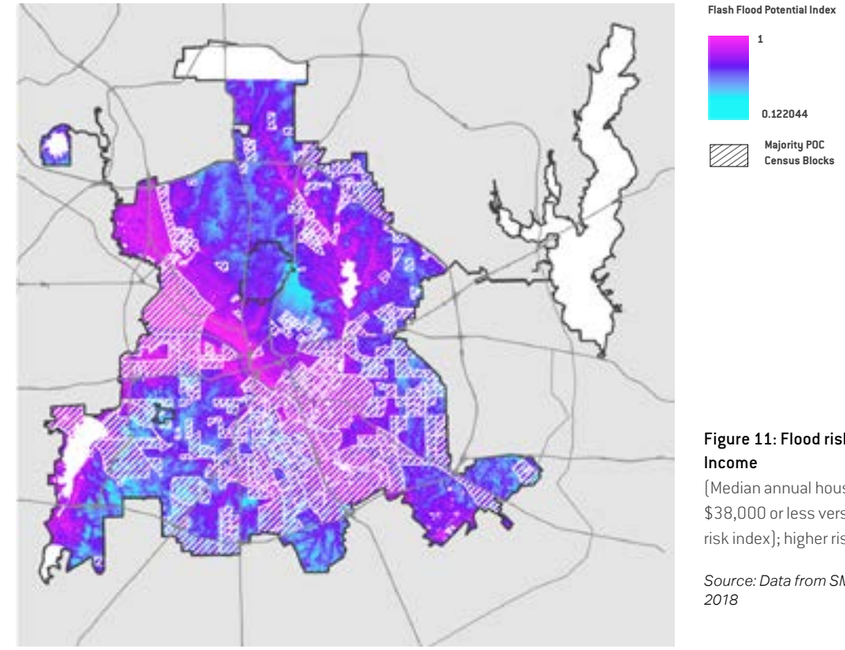


Figure 11: Flood risk to people with low Income
(Median annual household income of $38,000 or less versus composite flash flood risk index); higher risk shown in pink

Source: Data from SMU, modelled by Rivera,S. 2018

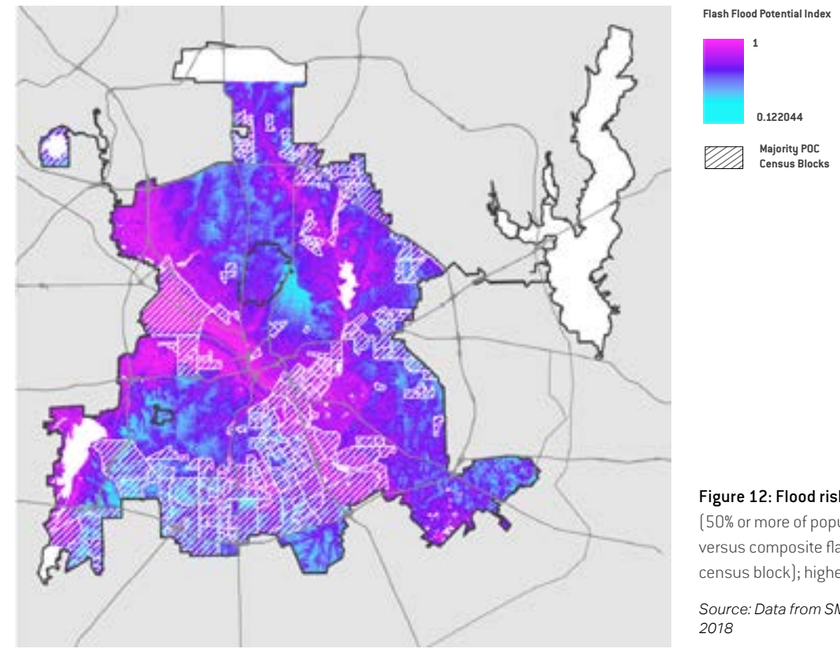


Figure 12: Flood risk to people of color
(50% or more of population people of color versus composite flash flood risk index by census block); higher risk in pink

Source: Data from SMU, modelled by Rivera,S. 2018

IMPACTS ON THE ECONOMY

Dallas is the ninth most populous city in the United States (2018) and continues to grow in population and employment. Twenty-three Fortune 500 and 43 Fortune 1000 companies are headquartered in the Dallas region. The Federal Reserve Bank of Dallas estimates that 'severe weather events can have a substantial human and economic cost' and are likely to have 'a negative impact on the region's longer-term business prospects and migration trends.'[4]
The industries most sensitive to climate change in the Great Plains regions are agriculture and energy, with declining crop yields and increased electricity demand in each industry, respectively. Economic losses in agricultural production from the 2011 drought exceeded all previous droughts on record—estimated at $7.62 billion.[5] Out of all U.S. states, Texas is estimated to have the highest increase in electricity demand by mid-century: heat-related labor productivity will decline across all sectors in Texas and will likely cost the economy up to $12.5 billion statewide each year, with a 1-in-20 likelihood of costing more than $19.6 billion annually.[6]

Employment areas most likely to be impacted by climate change include mining, logging, and construction; trade, transportation, utilities and manufacturing. These sectors account for approximately 1/3 of the region's total employment. Economic impacts may include:

- Disruptions to operations due to power outages and damage to critical infrastructure caused by extreme weather events.
- Brownouts as a result of increased demand for electricity.
- Labor force shifts away from oil and gas development to renewable energy resources.
- A decrease in labor productivity for outdoor workers (e.g., those in construction industry), which may lead to building and infrastructure projects slowing down or being put on hold.

Climate change can't be directly attributed to any single extreme weather event, including Hurricanes Harvey, Maria, and Irma; California's wildfires or Australia's bushfires, but it makes such events more likely.

> **"They are starting to be more than tail events, they're starting to affect economic outcomes,"**
>
> Robert Kaplan, President of the Federal Reserve Bank of Dallas.[7]

During Hurricane Harvey in August 2017, 68 people lost their lives, and 300,000 homes and businesses were flooded, resulting in an estimated loss of $74 billion based on damage to property and lost output.

Figure 13 illustrates National Weather Service (NWS) data for billion-dollar disasters from 1980 to 2019 for the seven types of natural disasters that the National Oceanic & Atmospheric Administration (NOAA) tracks. Over this time period, there has been a significant increase in the number of events, particularly for severe storms. It should be noted that Texas leads the country in the number of billion-dollar weather-related disaster events; and North Texas experienced two such events within the past year.

Finally, it is important to note that consumers drive commercial sector efforts. The public's awareness of the relationship between the impacts of climate change and actions taken in response to it can influence how business produces products; how they work to reduce waste; and how they invest their funds.

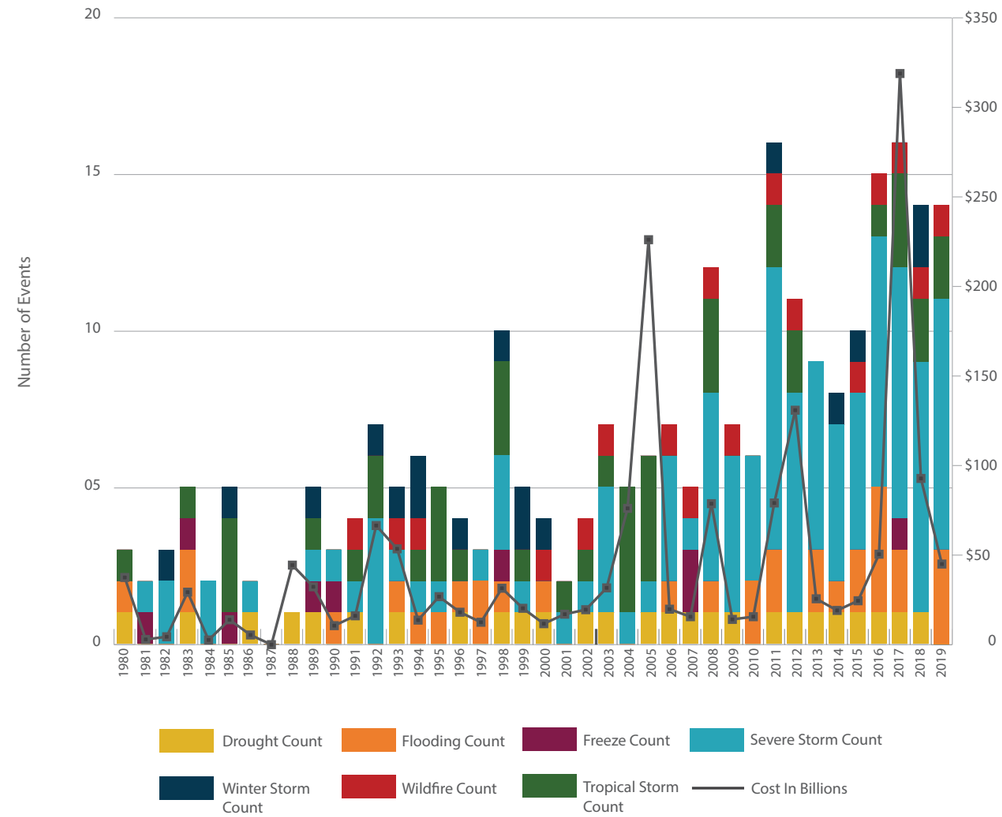


Figure 13: Weather and climate disasters in the United States (CPI adjusted)

(Data from NOAA)

> Given current projections of rising average global temperature over the next century, the likelihood that temperatures persistently drift above their historical norm is very high. [....] this could lead to a permanent negative impact on state-level output growth (that is lower production growth in all sectors of the United States economy apart from the mining, government, and finance, insurance and real estate sectors).
>
> While persistent deviations of precipitation from its historical norm (either above and below) or below-the-norm temperatures are less likely, the swings (variability) could be unprecedentedly large owing to climate change, and hence, the negative impact on state-level output growth could be sizable and long lasting.
>
> Long-Term Macroeconomic Effects of Climate Change
> (Federal Reserve Bank of Dallas, 2019)

IMPACTS ON THE ENVIRONMENT

Ecosystems are interconnected networks of living and non-living systems. Ecosystem services provide benefits that support plant and human health such as the production of clean air and water, improvements to soil health, and the creation and protection of habitat. Changes to one part of the system have multiplied effects across all systems. Rising temperatures may cause changes to growing seasons and habitat loss, which impact the migration and distribution of wildlife. White-winged doves have been observed as far north as Oklahoma, despite being previously confined to the Lower Rio Grande Valley[9], which illustrates that habitat suitability is changing.

The problem with this is that environmental conditions are changing faster than some species will be able to adapt, which could lead to the loss of plant and animal life.

Increased temperatures can dry out the soil and lead to increased water evaporation from our reservoirs. This will strain the water supply for the region, as well as degrade the water quality of our lakes and rivers, since pollutants will become more concentrated. In 2011, the drought killed approximately 5.6 million trees in urban areas across the state. Climate change will also increase the risk of fires in forested areas and wooded neighborhoods, although wildfire threat is currently low in most areas of the city, including the Great Trinity Forest. Wildfire risk is moderate in the Cedar Ridge Preserve in the southwest and high in the forested region between Lavon Lake and Lake Ray Hubbard in the northeast. **Figure 14** illustrates wildfire threat near Dallas. Climate change will also impact the sensitive urban ecosystem balances that provide food, water and habitat to plant, animal and human life.

COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN

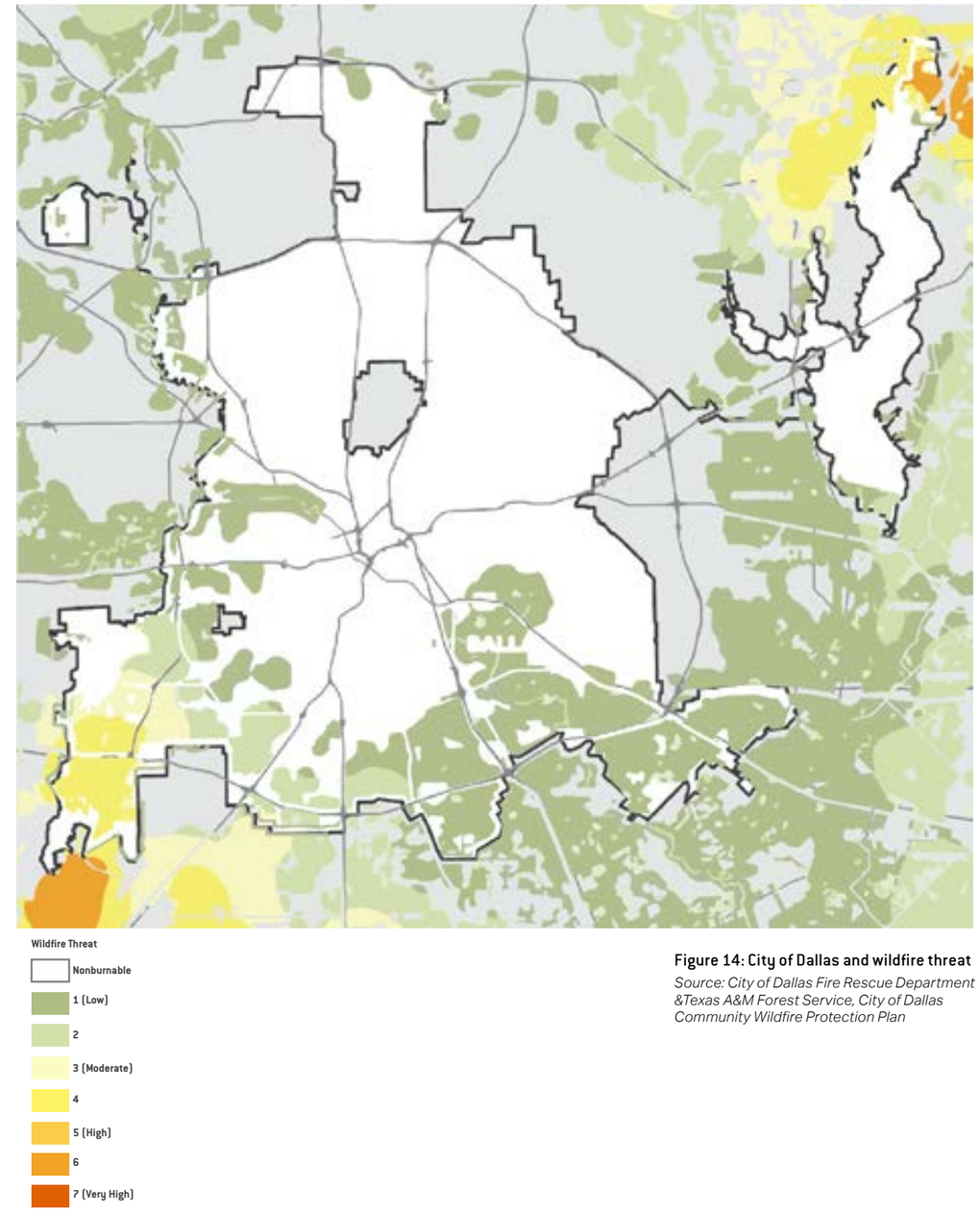


Figure 14: City of Dallas and wildfire threat

Source: City of Dallas Fire Rescue Department &Texas A&M Forest Service, City of Dallas Community Wildfire Protection Plan

01

GREENHOUSE GAS EMISSIONS + TARGETS

The City prepared a 2015 community wide GHG inventory to be used as the basis for emissions forecasting in the CECAP. The inventory provides a snapshot of the volume and sources of GHG emissions within Dallas and serves as a reference point to help determine appropriate emissions reduction targets. It also indicates the types of measures to pursue to make meaningful progress toward those targets.

BASE YEAR INVENTORY

Emissions by Sector

Dallas' 2015 emissions inventory totals 19,529,600 MT CO_2e/year, which is approximately 15 MT CO_2e per person per year. Stationary energy is the largest contributor of GHG emissions in the city (64%), with transportation contributing most of the remainder (35%). Stationary energy sources refer to electricity and other combustible fuels utilized in buildings and the GHG emissions that are contributed through these ***(also see Glossary).*** The transportation and energy sectors account for approximately 99% of total emissions, meaning that local emissions reduction efforts will need to focus on these two sectors (these will be addressed under three goals in the CECAP). The waste sector (including wastewater) is responsible for the remaining <1% of emissions. **Table 1 and Figure 15** presents the complete 2015 inventory by emissions subsector. Table 1 also shows the relative contribution of emissions by fuel type in the stationary energy sector, where stationary combustion refers to on-site fuel burning, such as natural gas, kerosene, or coal.

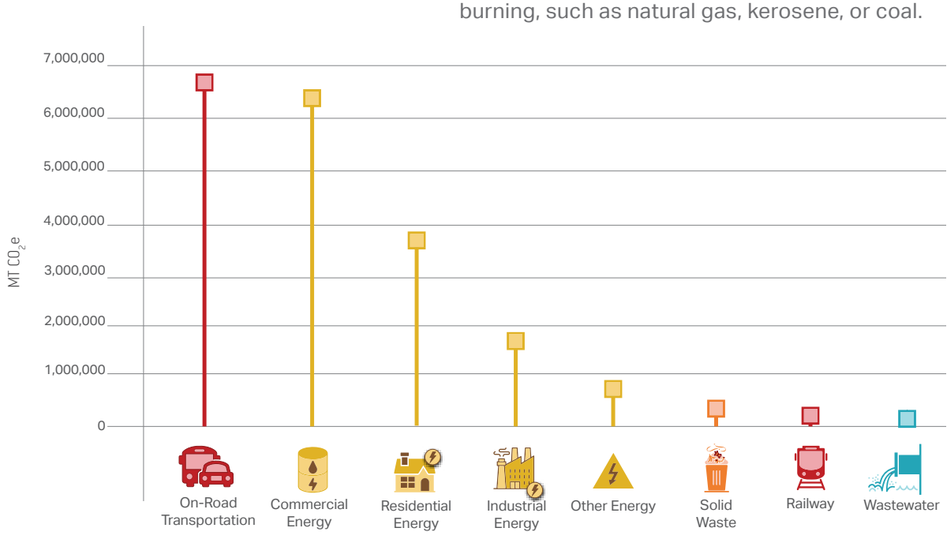


Figure 15: Community emissions by sub-sector
Source: Data from City of Dallas 2017

Sector/Subsector/Fuel Type	2015 Emissions (MT CO_2e)	% of 2015 Emissions
STATIONARY ENERGY	**12,544,800**	**64%**
Residential	3,893,700	20%
Stationary Combustion	742,400	4%
Electricity	3,151,300	16%
Commercial	6,475,300	33%
Stationary Combustion	1,261,800	6%
Electricity	5,213,500	27%
Industrial	1,659,400	8%
Stationary Combustion	345,200	2%
Electricity	1,314,200	7%
Other Non-Specified Sources	2,400	<1%
Fugitive Emissions	514,000	3%
TRANSPORTATION	**6,849,600**	**35%**
On-Road Vehicles	6,779,900	35%
Railways	69,700	<1%
WASTE	**135,200**	**1%**
Solid Waste	135,100	1%
Wastewater	100	<1%
TOTAL	**19,529,600**	**100%**

Table 1: 2015 Community Emissions by Sector, Subsector, and Fuel

Source: Data from City of Dallas 2017

Appendix C includes a detailed breakdown of emissions and sources by subsector and fuel type. It also provides further information about assumptions used for the forecasts and how the GHG reductions targets were developed.

GHG REDUCTION TARGETS

Emission reduction targets are a critical component of climate change mitigation planning—they demonstrate the City's commitment to global efforts on climate change and provide a goal post against which to evaluate the cumulative progress of the City's GHG reduction actions over time.

2050 Carbon Neutrality Target

The City of Dallas is committed to meeting the international emission reduction targets set by the Paris Agreement in 2016 and the goal to keep warming temperatures at or below 1.5 degrees Celsius. In 2017, Mayor Rawlings signed the Mayors National Climate Agreement in support of the Paris Agreement. Upon election in June 2019, Mayor Johnson reaffirmed the City of Dallas' commitment to this agreement. The City of Dallas is fully committed to protecting the community from the impacts of climate change and taking measures to reduce its GHG emissions.

To position the Dallas CECAP as a climate action plan that meets the ambitious objectives of the Paris Agreement, and with other cities around the world committed to bold action on climate change, the City of Dallas has adopted a target of carbon neutrality by 2050. Carbon neutrality refers to achieving net zero GHG emissions, through reducing emissions as much as possible and then balancing remaining emissions with carbon removal or carbon offset programs. The actions described in this plan are measurable, common sense solutions intended to move Dallas forward towards achieving this goal.

2030 Interim Target

Achieving the City's goal of carbon neutrality will require bold action, beginning now. Since the 2050 target year is still decades away, it is important to set interim targets to ensure the City is on a path to achieving its long-term goal. In evaluating interim targets for 2030, the City compared its emissions forecasts against different target options to understand the scale of reductions needed from the CECAP actions, and then selected an interim target that balances the City's ambition with the realities of Dallas' relatively high level of emissions in its base year. A common approach used by cities is to set interim targets based on a straight-line trajectory from their base year to their long-term goal. **Figure 16** shows this trajectory from the 2015 emissions base year to carbon neutrality by 2050. In Dallas, this would translate to a 43% reduction in total emissions below 2015 levels by 2030.

A review of climate plans from other cities in the United States allows an understanding that other cities are setting targets similar to Dallas for 2030 and 2050. Peer city 2030 targets are generally clustered around achieving a 40 to 50% reduction below base year levels, while 2050 targets are clustered around targets that reflect an 80 to 100% reduction below base year levels. Dallas' targets are consistent with both ranges as shown on **Table 2**.

Dallas' interim target represents an ambitious level of action to ensure the City is on track to achieving its long-term carbon neutrality goal. **Table 3** shows the interim and long-term emissions reduction targets evaluated in this plan compared to the emissions forecasts if no additional climate action is taken. The total emissions reductions and percent reductions needed for each target are also shown.

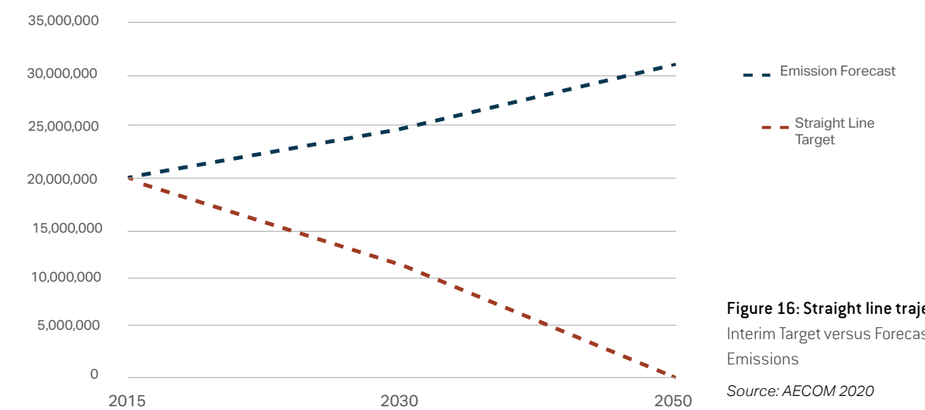


Figure 16: Straight line trajectory
Interim Target versus Forecasted Emissions
Source: AECOM 2020

City	Base Year	2030 Target (% below base year)	2050 Target (% below base year)
Atlanta	2009	40%	n/a
Austin	2010	47%	100%
Chicago	1990	26-28%[1]	80%
Dallas	2015	~43%	100%
Denver	2005	30%[2]	80%
Houston	2014	40%[3]	100%[3]
Los Angeles	1990	50%[2]	100%
New Orleans	2014	50%	n/a
Phoenix	2012	30%[2]	80%

[1] 2030 target is set below 2005 levels.
[2] Near-term target year is 2025 instead of 2030.
[3] Per 2019 draft CAP

Table 2: Targets adopted by peer cities

Source: AECOM 2020

Measure	2015	2030	2050
Forecasted Total Emissions	19,529,600	24,504,700	30,870,100
Total Emissions Targets	19,529,600	11,159,800	close to 0
Total Below Base Year	-	13,344,900	30,870,100
% Below Base Year		-43%	-100%

Table 3: City of Dallas 2030 and 2050 emissions reduction targets

Source: AECOM 2020

ACHIEVING THE TARGETS

Greenhouse gas reduction estimates based on CECAP actions

The CECAP proposes 97 actions across eight sectors, of which 45 are aimed at primarily reducing GHG emissions. As outlined in the City's 2015 communitywide GHG inventory, 64% of all communitywide GHG emissions can be attributed to stationary energy and 35% of emissions can be attributed to transportation sector in the base year. To meet the CECAP's GHG reduction targets, ambitious actions have been proposed to address emissions from these two sectors. Total estimated reductions from CECAP actions are approximately 9,825,200 MT CO_2e/yr in 2030 and 24,248,500 MT CO_2e/yr in 2050. The total impact of these estimated reductions when compared to the city's emissions forecasts and emissions targets is illustrated on **p.29 to 32.**

Through the implementation of all recommended actions as currently envisioned, the City would achieve reductions of 25% below 2015 levels by the 2030 target year (compared to its target of 43%) and 66% below 2015 levels by the 2050 target year (compared to its target of 100%). This represents a good start toward target achievement, especially when compared to the emissions forecasts; however, there is a need for further and greater action to achieve the City's ambitious targets.

The suite of policies proposed in the CECAP builds upon the City's ongoing work and commitment to sustainability, so in most instances, implementation will not begin from scratch, but reflect ongoing continuous improvement. In addition to providing GHG emissions reductions, the actions will also help Dallas residents and businesses to prepare and adapt to the impacts of climate change, while improving the environment and quality of life through co-benefits. The plan anticipates implementation through adaptive management and data-driven decision making.

The actions presented in this plan are designed to be implemented with an initial emphasis on education and voluntary participation, followed by incentives, then mandates, and ordinances.

Implementing mandates may result in greater emissions reductions from increased participation rates; however, there is a policy preference towards market-based decision making. Moving forward, the City will monitor GHG emission trends through regular GHG inventory updates. The results and trends will be compared to the targets established in this plan to determine if more aggressive action is needed.

ACHIEVING THE 2030 TARGET

The suite of actions in the plan have been carefully selected to start Dallas on its path to carbon neutrality by 2050. Given this is Dallas' first climate action plan, and to encourage buy-in and broad participation in the CECAP from businesses and residents, the City has chosen a phased approach to implementation over time.

The plan contains educational programs and incentives to inspire action and to allow time to build institutional capacity, develop public-private sector partnerships, and build community support to create momentum for voluntary updates of actions while laying the groundwork for more impactful and transformational actions in the future. The descriptions of the phased actions outline how each will be ramped up over time—e.g., from education to requirement.

As the City transitions actions to requirements during periodic plan updates, the assumptions around emissions reductions will also be updated to evaluate progress toward the City's 2030 reduction target. With community support and buy-in, the City will be able to accelerate and adopt subsequent phases earlier.

The importance of the electricity sector
Although Texas leads the nation in wind-powered electricity generation and produces one-fourth of all the U.S. wind electricity (2017),[10] less than 20% of the energy generated in the Electric Reliability Council of Texas (ERCOT) region comes from renewable energy sources. In the plan's base year (2015), approximately 45% of electricity came from natural gas combustion, 33% from coal, 11% from nuclear, and 10% from renewable energy sources.[11] The City's 2015 base year inventory was developed based on the EPA eGRID 2014v2 electricity energy sources reported for the ERCOT subregion. While the State continues to make progress in increasing its renewable energy portfolio, coal energy sources in the grid contribute significantly to the city's building sector emissions.

Looking forward, ERCOT's Capacity, Demand and Reserves (CDR) Report expects use of coal and nuclear power to decrease, while use of natural gas and renewable energy sources to increase. ERCOT's CDR estimates energy sources through 2029, which were used in the CECAP's 2030 GHG analysis scenario. Beyond that timeframe, the plan looked to the US EIA for long-term energy trends in the country to estimate how electricity energy sources might change through 2050. These long-term trends from 2019 to 2050 were applied to ERCOT's specific energy source mix to estimate what ERCOT's 2050 energy scenario could be if it followed national projections. **Table 4** summarizes the energy sources included in the CECAP analysis for these time horizons.

As shown, long-term electricity trends estimate further decreases in coal energy and increases in renewable sources. These improvements over the base year levels, if realized, would have a significant impact on reducing emissions through 2050. However, this scenario alone will not help Dallas to reach its target. A faster transition to renewable sources is critically important to achieving the City's carbon neutrality target. Lower carbon electricity emissions will also enhance the GHG reduction of other important actions, including the increased use of electric vehicles and building energy switches from fossil fuel-based equipment to electric systems.

Dallas will need access to 100% emissions free electricity sources by 2050 to support its carbon neutrality goal. However, Texas' unique energy market makes it difficult for cities to directly regulate this sector. In 1999, the Texas legislature deregulated the retail electricity market to introduce competition and give customers the choice to select their retail providers. This led to Dallas being serviced by over 115 retail electricity providers, whose rates are based on the market price. Importantly, some of these electricity providers allow customers to purchase 100% renewable electricity at rates competitive with other retailers, which provides an opportunity for the City to indirectly influence electricity sector emissions. While ERCOT will likely continue to change its energy generation sources in the future to include a growing share of renewable energy, residents and businesses also have the option to choose renewable energy sources today from their electricity provider, which can help to speed up decarbonization in the energy sector.

Measure	2015	2030	2050
Natural Gas	45%	61%	47%
Coal	33%	16%	11%
Renewables	10%	17%	35%
Nuclear	11%	6%	7%

Table 4: Energy sources for 2015, 2030 and 2050

Source: Data from U.S. EPA eGRID 2014v2, 2015; ERCOT 2019; EIA 2020

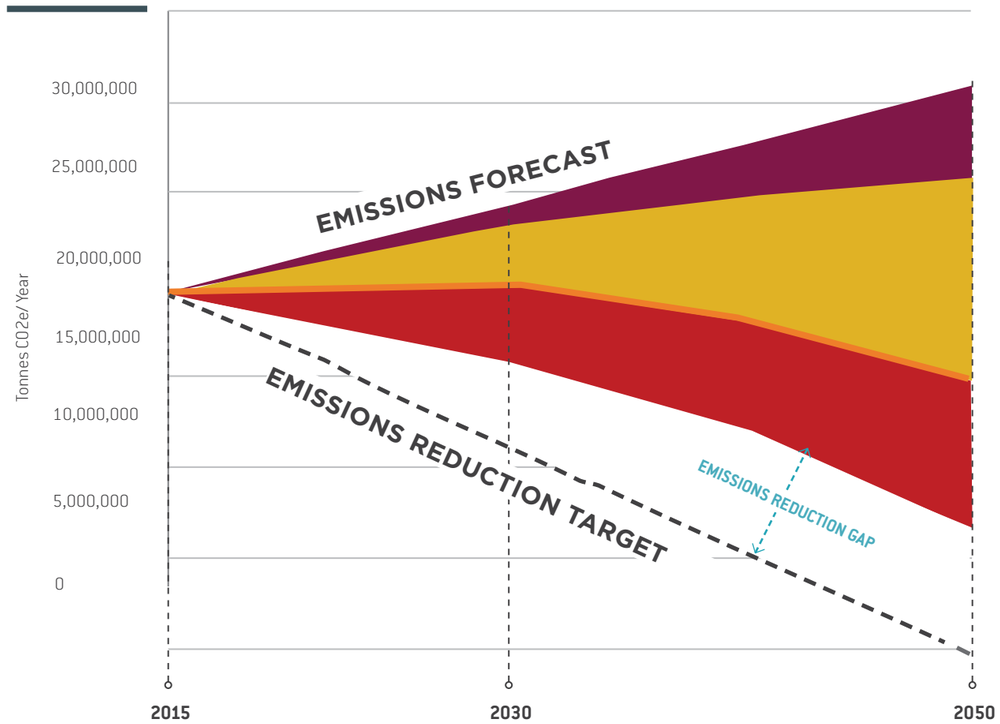
GHG REDUCTION ESTIMATE SCENARIOS

The following pages present the two GHG reduction scenarios analyzed for the CECAP. The left page in each scenario includes a figure illustrating the City's emissions forecasts, target, and impact from action implementation, as well as a summary of progress toward the 2030 and 2050 targets. The right page shows how the CECAP's actions are organized into GHG reduction strategies and notes the underlying assumptions for each strategy. The figures and lists of actions use colors to identify which GHG emissions sector is reduced through each action as indicated by the legend (Note that the tonnes CO_2e reduced per GHG reduction strategy are included in a version of these figures provided in the Appendix C).

Scenario 1: GHG reductions based on CECAP actions
The first scenario represents implementation of the CECAP actions as currently written. This scenario would achieve a 25% reduction below 2015 levels in 2030 and 66% below 2015 levels in 2050. As shown in the figure, the greatest reductions are associated with increased renewable electricity. This is a combination of the changes estimated to occur in the ERCOT grid (as described in the previous section), installation of rooftop solar photovoltaic systems, and a portion of residents and businesses voluntarily choosing electricity providers that offer 100% renewable energy options. The second greatest source of reductions are from transportation actions that would reduce total vehicle trips in the community and a gradual shift toward electric vehicles based on industry forecasts. Building energy actions that increase energy efficiency provide additional reductions and increase through 2050 with an assumption that all new construction is designed to be zero net energy beginning in 2030. Waste actions provide minimal GHG reductions due to that sector's relatively minor contribution to Dallas' total emissions inventory. However, waste actions will be critical to achieving carbon neutrality and provide other important co-benefits described later in the plan.

Scenario 2: GHG reductions based on increased participation
The second scenario is more optimistic based on increased action implementation in certain areas, including the use of some regulatory mandates. This scenario would achieve 30% reductions below 2015 levels in 2030 and 71% below 2015 levels in 2050. The changes in the second scenario are highlighted through the list of GHG reduction strategies and implementation assumptions. This scenario would increase reductions in the building energy sector with requirements for residential and commercial building energy efficiency improvements beginning in 2030. It also includes an aggressive transportation demand management program to increase work-from-home participation for jobs that can be performed remotely. This would help to reduce total vehicle trips in the city. The remaining reduction gap in this optimistic scenario primarily represents a need to further increase use of renewable electricity and expand electrification of vehicles and buildings.

GHG REDUCTION ESTIMATE BASED ON CECAP ACTIONS



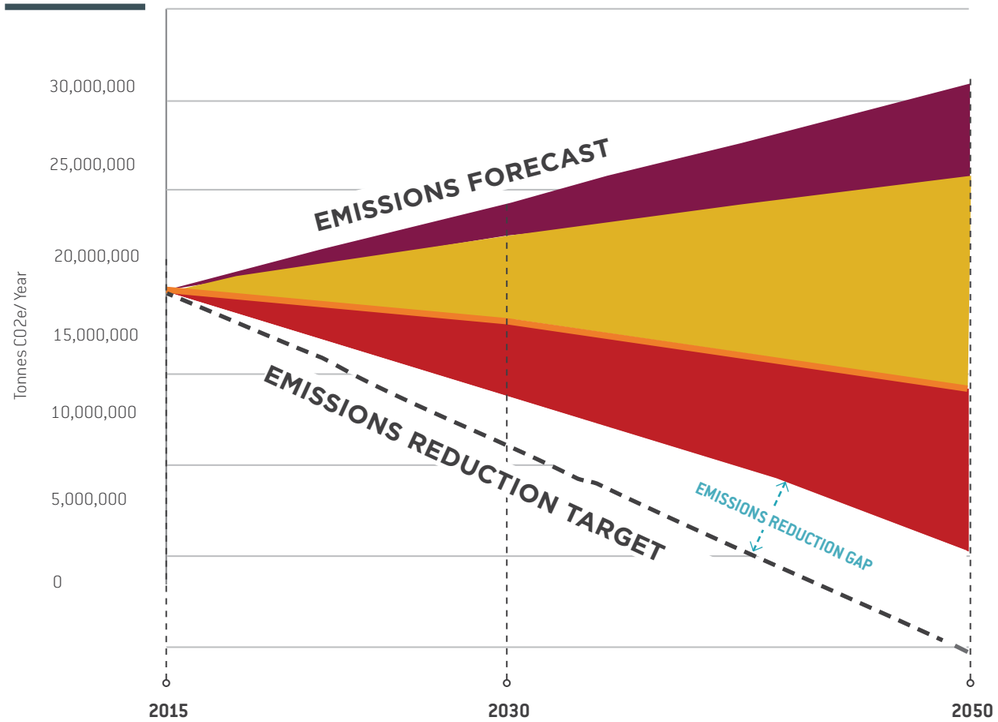
PROJECTED GHG REDUCTION	**25%** BELOW 2015	**66%** BELOW 2015
TARGET GHG REDUCTION	**43%** BELOW 2015	**100%** BELOW 2015

LEGEND

- Actions that result in improved energy efficiency or fuel switching from natural gas to electricity.
- Actions that support waste diversion and treatment changes.
- Actions related to the electricity grid energy mix to increase use of renewable sources.
- Actions to increase use of public transit and active transportation options, as well as those that support the adoption of electric vehicle technology.

Actions	GHG Reduction Strategies	Assumptions
B1 B2 E7 E8 T16	Energy Efficiency: Existing City Buildings	• City buys RECs to offset 100% of municipal electricity use in 2030 and 2050. • 50% and 100% of municipal buildings achieve carbon neutrality by 2030 and 2050, respectively. • Love Field and Dallas Executive Airport achieve Level 3+ carbon accreditation.
B4 B9	Energy Efficiency: Existing Residential Buildings	• 10% of existing residential buildings reduce energy use 10% and 25% through lighting, appliance upgrades, space heating/cooling improvements, low-flow fixtures, and building envelope improvements by 2030 and 2050, respectively.
B7 B8 B10	Energy Efficiency: Existing Commercial Buildings	• 20% of existing commercial buildings reduce energy use 15% below 2015 levels by 2030 and 50% reduce energy use 20% below 2015 levels by 2050
B12 B14	Energy Efficiency: New Construction	• All new construction from 2030 onward is zero-net energy.
B11 E3 E4 E5 E6 E9	Renewable Energy: Increase Use	• Dallas achieves 10% and 50% of solar capacity potential by 2030 and 2050, respectively (currently achieves less than 1% potential). • 20% and 50% of customers purchase 100% renewable contract by 2030 and 2050, respectively.
SW9	Energy Generation: Organics	• 35% and 80% of food and yard waste is diverted by 2030 and 2050, respectively.
SW5	Recycling: Paper Diversion	• 60% and 90% paper waste diversion by 2030 and 2050, respectively.
T3 T4 SW4	Electric Vehicles: Passenger	• 14% and 50% passenger vehicles electric in 2030 and 2050, respectively.
T1	Electric Vehicles: Transit	• 75% and 100% of DART buses are electric by 2030 and 2050, respectively.
T11 T12	Land Use: Transit Oriented Development	• 10% and 30% of new housing units are in TOD locations by 2030 and 2050, respectively.
T2 T5 T6 T9 T7 T10 T13 T14 T15	Travel Mode Shift: SOV Trip Reduction	• Travel mode shift from single occupant vehicle to Bus and Light rail from 88% to 79% in 2030 and 88% to 62% in 2050.
	Vehicle Fuel Efficiency: Federal	• Additional reductions associated with implementation of federal vehicle fuel efficiency standards were included in the wedge diagram and total 2,603,600 and 1,536,200 MT CO_2e/yr for 2030 and 2050, respectively.

GHG REDUCTION ESTIMATE BASED ON INCREASED PARTICIPATION



PROJECTED GHG REDUCTION	**30%** BELOW 2015	**71%** BELOW 2015
TARGET GHG REDUCTION	**43%** BELOW 2015	**100%** BELOW 2015

LEGEND

- Actions that result in improved energy efficiency or fuel switching from natural gas to electricity.
- Actions that support waste diversion and treatment changes.
- Actions related to the electricity grid energy mix to increase use of renewable sources.
- Actions to increase use of public transit and active transportation options, as well as those that support the adoption of electric vehicle technology.

Actions	GHG Reduction Strategies	Additional Assumptions
B1 B2 E7 E8 T16	Energy Efficiency: Existing City Buildings	
B4 B9	Energy Efficiency: Existing Residential Buildings	• 100% of homes sold from 2030 through 2050 reduce energy use by 10% through energy efficiency improvements at point-of-sale.
B7 B8 B10	Energy Efficiency: Existing Commercial Buildings	• 100% commercial buildings perform retro-commissioning to reduce energy use 15% by 2030, 100% commercial buildings perform comprehensive energy upgrade program to reduce energy use 30% by 2050
B12 B14	Energy Efficiency: New Construction	
B11 E3 E4 E5 E6 E9	Renewable Energy: Increase Use	• *Changed as a result of decreased electricity use from other actions*
SW9	Energy Generation: Organics	
SW5	Recycling: Paper Diversion	
T3 T4 SW4	Electric Vehicles: Passenger	• *Changed as a result of decreased electricity use from other actions*
T1	Electric Vehicles: Transit	
T11 T12	Land Use: Transit Oriented Development	
T2 T5 T6 T9 T7 T10 T13 T14 T15	Travel Mode Shift: SOV Trip Reduction	• 10% of single occupant vehicle trips are avoided in TDM work from home programs
	Vehicle Fuel Efficiency: Federal	• *Changed as a result of fewer vehicle trips from other actions*

Figure 17: Intersection between mitigation, adaptation and environmental quality
(AECOM 2020)

02

GOALS, OBJECTIVES, ACTIONS + TARGETS

DEVELOPMENT OF ACTIONS

The actions in the CECAP were developed based on community input, City staff and stakeholder input, relevant best practices from peer and aspirational cities, and other international standards, as potential solutions to address Dallas's current and future challenges related to climate change. **Figure 18** provides an illustration of the overall process, including the iterations of action development, equity analyses, and the potential strategy development in these lenses.

The actions build on the initiatives that the City has implemented **(see Table 5)** as well as benchmarking best practices to introduce new ideas. The selection and prioritization of actions to include in the CECAP was based on an action's potential to effectively deliver at least one of four primary benefits **(Figure 17)**:

- **Mitigation** – actions with the potential to reduce GHG emissions that cause climate change.
- **Adaptation** – actions with the potential to manage the risk of climate change impacts
- **Environmental Justice** – actions that address issues of greatest concern for communities disproportionately impacted by climate change.
- **Environmental Quality** – actions that improve general sustainability and quality of life.

Actions were also evaluated based on equity, cost-effectiveness for both the public and private sectors, technical effectiveness, consistency with policy, and City authority.

Figure 18: Action development process
(Source: AECOM 2020)

COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN

02

ALIGNMENT WITH OTHER PLANS

PLAN OBJECTIVES

PLANS	Buildings A	Buildings B	Buildings C	Energy A	Energy B	Energy C	Transportation A	Transportation B	Transportation C	Transportation D	Solid Waste A	Solid Waste B	Solid Waste C	Water A	Water B	Water C	Ecosystems A	Ecosystems B	Ecosystems C	Food Ag A	Food Ag B	Food Ag C	Food Ag C	Food Ag D	Air Quality A	Air Quality B
Forward Dallas! Comprehensive Plan (2006)	●	●						●	●	●	●	●		●			●	●	●						●	
A Balanced Vision Plan for the Trinity River Corridor (2003)								●	●	●							●	●	●							
Resilient Dallas (2018)								●	●	●					●		●	●	●							
Building a Cool, Clean & Resilient Dallas (2018)														●	●		●	●	●						●	
Sustainable Development & Construction: Green Building Ordinance (2015)	●	●																								
Oncor Energy Efficiency Plan and Report (2018)	●				●																					
Dallas Green Energy Policy (2019)					●																					
2030 Transit System Plan (2006)								●	●																	
City of Dallas Complete Streets Design Manual (2016)								●		●								●								
Dallas Bike Plan (2011)								●		●																
Dallas Trail Network Plan (2008)								●		●								●								
The 360 Plan (2017)								●	●																	
Neighborhood Plus Plan (2015)									●																	
Vulnerability and Risk Assessment for Transportation Infrastructure (2015)										●																
Clean Fleet Vehicle Policy (2015)							●					●														
City of Dallas Waste Characterization Study (2013)											●		●													
Litter and Illegal Dumping Assessment Study (2018)												●														
Local Solid Waste Management Plan 2011 - 2060 (2013)											●	●	●													
Wastewater Treatment Facilities Strategic Plan (2010)															●											
Interim Bacteria Reduction Plan (2012)														●												
Interior Drainage Study for the East and West Levee (2014)															●											
Water Conservation Five-Year Work Plan (2019)														●												
2014 Dallas Long Range Water Supply Plan to 2070 and Beyond (2015)														●		●										
Stormwater Management Plan (2019)														●	●	●										
Dallas Park and Recreation Department - Comprehensive Plan (2016)								●	●	●								●								
Great Trinity Forest Management Plan (2008)																		●								
Urban Heat Island Management Study (2017)																	●	●								
Healthy Food Dallas -Presentation by Economic Development Committee (2017)																				●	●	●				

Table 5: A Matrix comparison of CECAP objectives with other City plans
Note: CECAP objectives are organized by goal. Letters indicate different objectives based on the order in which they appear throughout the plan.

02

SUMMARY OF TARGETS

NET ZERO ENERGY NEW CONSTRUCTION
100% starting in 2030

ENERGY USE IN EXISTING RESIDENTIAL BUILDINGS
10% of existing buildings reduce energy use 10% by 2030
10% of existing buildings reduce energy use 25% by 2030

HEALTHY, AFFORDABLE FOOD ACCESS
50% of the population by 2030
75% of the population by 2040
100% of the population by 2050
(1/2 mile walk or 10-minute drive from home)

ACRES OF URBAN GARDENS
Increase in 20% by 2030
increase in 50% by 2040
increase in 75% by 2050
(producing food for community distribution, local markets or restaurants)

RESTAURANTS, FARM STANDS, OR MARKETS SOURCING FROM LOCAL PRODUCERS
Increase in 10% by 2030
Increase in 25% by 2040
Increase in 50+% by 2050

SOLAR POWER INSTALLED
739,000 MWh by 2030
3,695,000 MWh by 2050

RENEWABLE ELECTRICITY PLANS
20% of residents + businesses enrolled by 2030
50% of residents + businesses enrolled by 2050

WATER CONSUMPTION
1% decrease (per-capita) annually

WATER FOR INDIRECT REUSE
5% implementation by 2030
10% implementation by 2050

IMPAIRED WATERBODIES LISTED IN WATERSHED
30% reduction by 2030
60% reduction by 2040
100% reduction by 2050
(within DWU service area)

GHG EMISSIONS FROM TREATMENT FACILITIES
45% reduction by 2035
100% reduction by 2050

COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN

PUBLICLY AVAILABLE EV CHARGING
1,500 outlets installed to support 39,000 vehicles by 2030

ELECTRIC FLEETS
All new transit vehicle purchases by the City, DISD, DART fully electric by 2030
100% electrified fleet by 2040

SINGLE OCCUPANT VEHICLE TRAVEL MODE SHIFT
88% to 79% in 2030
88% to 62% in 2050

GROUND LEVEL OZONE
meet NAAQS attainment standard by 2030
maintain status through 2050

AIR POLLUTANTS
maintain NAAQS attainment status through 2050
(includes lead, carbon monoxide, nitrogen dioxide, particulate matter (PM10), particulate matter (PM2.5) and sulfur dioxide)

ORGANIC WASTE
35% diverted by 2030
80% diverted by 2050

PAPER WASTE
60% diverted by 2030
90% diverted by 2050

LANDFILL DIVERSION
35% reduction in waste by 2030
45% reduction in waste by 2040

CANOPY COVER CITYWIDE
33% by 2030
37% by 2040
40+% by 2050

URBAN HEAT ISLAND INDEX
20% reduction by 2030
50% reduction by 2040
75% reduction by 2050

PARK OR TRAIL ACCESS
80% of the population by 2030
90% of the population by 2040
95% of the population by 2050
(1/2 mile walk from home)

02

ACTION LEGEND + SUMMARY

ACTION NUMBER + NAME

OBJECTIVE

ENSURE THAT NEW BUILDINGS ARE CONSTRUCTED SUSTAINABLY AND ARE CARBON NEUTRAL.

B12. EVALUATE AND CONSIDER A ZERO NET ENERGY CODE FOR ALL NEW BUILDINGS AND SUBSTANTIAL RENOVATIONS BY 2030.

PRIMARY BENEFIT

CO-BENEFITS

ACTION TYPE
Plan
ACTION SOURCE
New Action

Zero net energy (ZNE) buildings are achieved through high-efficiency design and construction that minimizes energy demand, and then offsets that meet demand with on-site renewable energy sources. To guide energy efficiency in new construction and renovations, Dallas adopts and implements building codes, including the International Energy Conservation Code (IECC). The IECC is updated on a three-year cycle through a stakeholder-driven process, and while energy efficiency improvements have been included in previous versions of the code, special interest groups have slowed these efficiency gains in recent versions. Achieving ZNE construction in the near-term will help to avoid emissions lock-in from continued development of fossil fuel-dependent buildings. The City will evaluate its options to adopt different building energy codes in the future, if IECC updates fail to provide a pathway toward zero net energy buildings. The City will consider alternative code options to achieve zero net energy objectives, such as Architecture 2030's Zero Code, California's Building Energy Efficiency Standards, and the City of Boulder Energy Conservation Code. The City will aim to implement a ZNE building code starting in 2030 for new construction and will identify ways to incentivize, early voluntary achievement of this

EQUITY CONSIDERATIONS

ACTION TYPE

- **01** Advocacy
- **19** Assessment / Plan
- **19** Educational
- **13** Incentives
- **10** Mandates
- **01** Personnel
- **27** Partnership
- **22** Program
- **01** Policy

ACTION SOURCE

- **68** New Action
- **01** Existing Action: an action previously recommended but not yet implemented / no longer active
- **33** On-going Action: an active action that CECAP proposes to continue to fund/support

PRIMARY BENEFIT

- **45 Mitigation:** actions with the potential to reduce GHG emissions that cause climate change
- **21 Adaptation:** actions with the potential to manage the risk of climate change impacts
- **20 Environmental Quality:** actions that improve general sustainability and quality of life.
- **11 Environmental Justice**: actions that address issues of greatest concern for communities disproportionately impacted by climate change.

EQUITY CONSIDERATIONS

Factors that are considered include whether (and how) an action would specifically benefit or burden vulnerable communities as well as whether an action provides benefits that are accessible to vulnerable communities.

97 CECAP ACTIONS

SECTORS / GOALS

- **16** BUILDINGS
- **11** ENERGY
- **19** TRANSPORTATION
- **09** SOLID WASTE
- **15** WATER RESOURCES
- **09** ECOSYSTEMS
- **14** FOOD + URBAN AGRICULTURE
- **04** AIR QUALITY

PRIMARY BENEFIT

- **45** MITIGATION
- **21** ADAPTATION
- **20** ENVIRONMENTAL QUALITY
- **11** ENVIRONMENTAL JUSTICE

CO-BENEFITS

- **46** IMPROVE PUBLIC HEALTH + WELL-BEING
- **40** PROVIDE COST SAVINGS
- **31** IMPROVE AIR QUALITY
- **28** PROVIDE EDUCATION, SKILLS OR TRAINING
- **24** IMPROVE ACCESS TO EMPLOYMENT / JOB CREATION
- **15** REDUCE INEQUALITY + POVERTY
- **17** REDUCE GHG EMISSIONS
- **08** INCREASE NATURAL RESOURCE CONSERVATION
- **11** IMPROVE WATER QUALITY
- **13** REDUCE RESOURCE CONSUMPTION
- **10** PROMOTES ENVIRONMENTAL STEWARDSHIP
- **10** REDUCE VULNERABILITY

COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN

SELECT ANY ICON TO SKIP DIRECTLY TO THAT GOAL

DALLAS' **BUILDINGS** ARE ENERGY-EFFICIENT AND CLIMATE RESILIENT.

Increase energy efficiency of existing buildings or facilities.

Ensure that new buildings are constructed sustainably and are carbon neutral.

Increase climate resilience for new and existing buildings through structural and operational improvements.

DALLAS GENERATES AND USES RENEWABLE, RELIABLE, AND AFFORDABLE **ENERGY.**

Maintain a high degree of reliability during extreme weather events.

Encourage investment in, and greater use of, renewable energy.

Ensure affordable access to renewable electricity.

DALLAS' COMMUNITIES HAVE ACCESS TO SUSTAINABLE, AFFORDABLE **TRANSPORTATION** OPTIONS.

Shift the surface transportation system to move people and goods in fuel-efficient vehicles.

Reduce trips where people drive alone.

Synergize jobs and housing with transportation infrastructure to increase access to walking and biking options, and public transit.

Ensure that walking, biking, public transit, vehicular transportation infrastructure is reliable and safe under all weather conditions.

DALLAS IS A ZERO **WASTE** COMMUNITY.

Create opportunities to go beyond recycling and choose to refuse, reduce, reuse and repair.

Operate a clean, green and efficient waste system.

Generate energy from organics.

DALLAS PROTECTS ITS WATER RESOURCES AND ITS COMMUNITIES FROM FLOODING AND DROUGHT.

Conserve and protect our water resources through community stewardship, educational programs and best management practices.

Protect neighborhoods from flooding and prepare them for droughts.

Be a regional leader in water resilience by leveraging innovative approaches, strategies and technologies.

DALLAS PROTECTS AND ENHANCES ITS ECOSYSTEMS, TREES AND GREEN SPACES THAT IN TURN IMPROVE PUBLIC HEALTH.

Leverage green spaces to provide climate adaptation benefits .

Increase, enhance and maintain healthy forests, parks, and green spaces.

Integrate nature-based solutions into the public realm as a public health strategy.

ALL DALLAS' COMMUNITIES HAVE ACCESS TO HEALTHY, LOCAL FOOD.

Build organizational capacity and partnerships around an urban agriculture network.

Improve food access in neighborhoods with low food access.

Reduce food miles by encouraging local food production and consumption.

Prepare the food system to be more resilient to extreme weather events.

Prevent food waste through food donations, recovery, diversion and composting.

ALL DALLAS' COMMUNITIES BREATHE CLEAN AIR.

Take a comprehensive approach to addressing air quality at the neighborhood level.

Increase energy efficiency of existing buildings or facilities.

Reduce trips where people drive alone.

Synergize jobs and housing with transportation infrastructure to increase access to walking and biking options, and public transit.

Increase, enhance and maintain healthy forests, parks, and green spaces, that improve air quality.

Operate a clean, green and efficient waste system.

Credit: David Worthington

GOAL 1: DALLAS' BUILDINGS ARE ENERGY-EFFICIENT AND CLIMATE RESILIENT.

Why Buildings Matter p. 45

Building on City Achievements p. 47

What can I do? p. 48

Actions p. 49

TARGETS

100% NEW CONSTRUCTION WILL BE NET ZERO ENERGY FROM 2030

10% OF EXISTING RESIDENTIAL HOMES REDUCE ENERGY USE 10% AND 25% BY 2030, AND 2050, RESPECTIVELY.

WHY BUILDINGS MATTER

The combined building and energy sectors account for the highest percentage of GHG emissions in Dallas (64%). Of these, 33% is from commercial buildings including offices, restaurants and retailers; 20% from homes, and 8% from the industrial sector. Although the building and energy sectors are very closely related and are considered one sector in the GHG inventory, actions that reduce emissions in the two sectors are on very different scales and so have been separated for the CECAP. This allows a sharper focus on actions that reduce energy use within the building envelope and actions that change the way electricity is generated for the grid.

The impacts of climate change on buildings are wide ranging. Warmer temperatures increase the demand for air conditioning and therefore increase energy costs. This will disproportionately impact low-income communities that already struggle to cover housing and utility bills. Vulnerable households that do not have access to air conditioning will be more vulnerable during heatwaves. The increase in heat could also compromise building foundations due to soil shrinkage. Flood events may cause physical damage or impede access to buildings. Homes and places of work can be protected from the impacts of climate change through structural and operational improvements. To reduce GHG emissions in buildings, actions have been developed to enable businesses and institutions (including the City) to reduce their energy use, leveraging a wide range of energy efficiency opportunities. Solutions are aimed at both existing buildings and new construction.

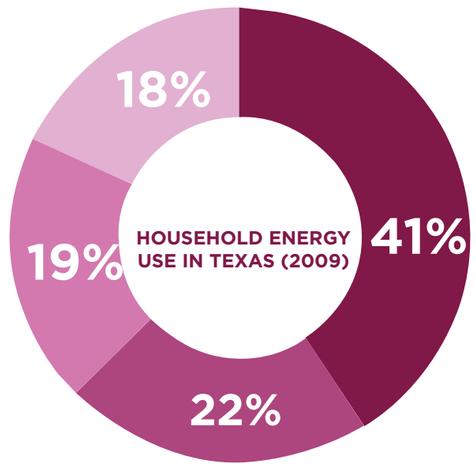


Figure 19: Household energy use in Texas
Source: Energy Information Administration (Household Energy Use in Texas) 2009

Energy efficiency improvements to existing residential and nonresidential buildings and appliances can reduce overall emissions and utility bills. Ensuring that all new construction is built in an energy efficient way will reduce future 'carbon lock-in' in the building stock. **Figure 20** indicates census tracts in Dallas with high percentages of poor housing. This provides an opportunity for energy efficiency improvements as these units are upgraded. The City may focus outreach efforts to publicize upgrading incentives to homeowners and landlords in these neighborhoods.

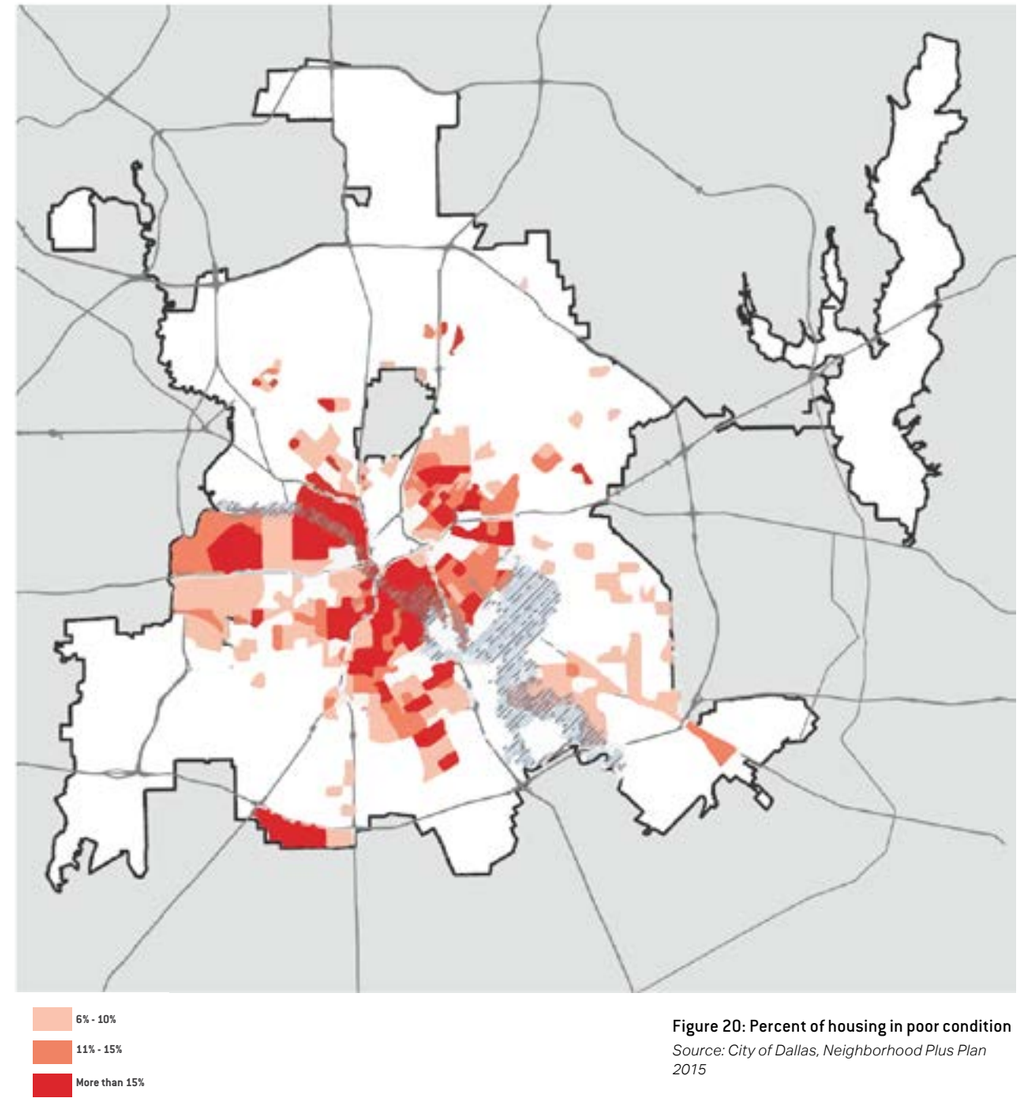


Figure 20: Percent of housing in poor condition
Source: City of Dallas, Neighborhood Plus Plan 2015

Credit: Stan9999

BUILDING ON CITY ACHIEVEMENTS

In 2003, Dallas passed the original Green Building Ordinance, which required all new buildings to meet higher efficiency standards than the building energy codes that were previously enforced. The intent was to implement sustainable strategies that enhance the quality of life and promote economic vibrancy in Dallas and the North Texas region. The ordinance consisted of two phases, the first phase focused on energy efficiency, water conservation, and reduction of the heat island effect though cool roofs, and phase 2, enacted in 2008, focused on expanding phase 1 to implement a comprehensive green building standard for all new construction. The adoption of this ordinance was recognized with the 2008 Building Officials Association of Texas (BOAT) Award of Excellence for extra-large jurisdictions and a 2009 North Central Texas Council of Governments CLIDE Award in Public Policy for its outstanding contribution to the building profession and the community.

The adoption of this ordinance has been highly successful. In 2018 Dallas ranked 3rd in EPA's annual Top 25 Cities list with 468 ENERGY STAR certified buildings with approximately 423,000 $MTCO_2e$ emissions avoided and $65 million in cost savings. The City of Dallas is committed to leading by example and since 2003 has implemented a 'City of Dallas Green Building Program' to incorporate sustainable building design and construction practices in municipal facilities. As of spring 2020, the City has 40 LEED certified facilities.[12]

WHAT CAN I DO?

Residents

01 **Lower your utility costs** through the Dallas County Health and Human Services' Weatherization Assistance Program, which provides assistance to income eligible households by weatherizing their homes.

02 Weatherization and energy-related minor home repairs can also be funded through the **Federal Low Income Home Energy Assistance Program** (LIHEAP).

03 **Join the DFW Solar Tour** to learn how your neighbors—homeowners and businesses alike—are using solar energy, wind energy, energy efficiency, and other sustainable technologies to save money and consume less of our natural resources.

Businesses

01 Harness the **PACE financing program** to access low-cost loans for water conservation, energy efficiency, and/or renewable retrofits—available to owners of commercial, industrial, and multi-family residential properties (5 or more units).

02 Owners of multi-family properties (5 or more units) can access discounted interest rates to finance a variety of **energy and water efficiency upgrades** through the Fannie Mae Green Initiative.

03 Business owners can enroll in the **no-cost** **Commercial Solutions Program** to identify energy-saving opportunities and receive incentives for qualifying appliance upgrades or building retrofits.

SELECT ANY INITIATIVE TO VISIT THE WEBSITE

COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN

SELECT ANY ACTION TO SKIP DIRECTLY TO THAT PAGE

01 | Dallas' BUILDINGS are energy-efficient and climate resilient.

Increase energy efficiency of existing buildings or facilities.

- Demonstrate leadership in developing a carbon neutrality plan for municipal operations.
- Achieve Level 3+ Airport Carbon Accreditation at Love Field for carbon neutral operations. Maintain accreditation for DFW and pursue for Dallas Executive Airport.
- Develop clear and comprehensive educational program for building owners and tenants about existing energy efficiency programs.
- Implement a citywide building weatherization program through partnership with community organizations.
- Identify new financing mechanisms to accelerate energy efficiency improvements in existing buildings.
- Establish a building efficiency and electrification program (for existing buildings) to replace appliances and systems with electric and other efficient and cost effective options.
- Increase participation and scope of the Dallas Green Business Certification program.
- Implement a Better Buildings Challenge that expands the 2030 District goals beyond Downtown Dallas.
- Establish a point-of-sale/point-of-lease home energy rating and disclosure educational program for single-family buildings.
- Prepare for the implementation of a benchmarking and disclosure ordinance for commercial buildings.
- Encourage building owners to submeter their buildings to support increased energy conservation

Ensure that new buildings are constructed sustainably and are carbon neutral.

- Update the building code to require wiring conduits for solar photovoltaics and electric vehicle charging infrastructure in new construction.
- Evaluate and consider a Zero Net Energy (ZNE) code for all new buildings and substantial renovations by 2030.

Increase climate resilience for new and existing buildings through structural and operational improvements.

- Establish urban greening factor requirements for new developments that quantify how projects contribute to urban greening for reduced stormwater runoff and urban heat island improvements.
- Promote passive building design (e.g., orientation, shading devices) through the City's zoning ordinance and design standards.
- Evaluate potential city-owned properties for the creation of 'resilience hubs'.

INCREASE ENERGY EFFICIENCY OF EXISTING BUILDINGS OR FACILITIES

B1. DEMONSTRATE LEADERSHIP IN DEVELOPING A CARBON NEUTRALITY PLAN FOR MUNICIPAL OPERATIONS.

ACTION TYPE
Plan
ACTION SOURCE
New Action

PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Cost savings, Education

Municipal emissions represent less than 3% of the citywide total emissions inventory.[13] However, the City of Dallas will continue to lead by example with the development of a plan to achieve carbon neutrality in municipal operations by 2030. Nearly two-thirds of Dallas' municipal emissions come from energy use in buildings and facilities. The City will standardize its building energy audit practices to ensure all buildings and facilities are reviewed to identify retrofit opportunities, including retro-commissioning of major building equipment and systems.

Based on the audit results, the City will establish a set of energy reduction targets that lead to carbon neutrality in municipal buildings. The City will complement energy efficiency improvements with additional renewable energy development and storage capacity to help offset remaining emissions at municipal buildings and facilities, including opportunities for solar panels on parking garages at Love Field.

To implement building retrofit opportunities, the City can contract with an ESCO to provide financing, installation, and monitoring of cost-effective improvements. This action will also include an educational program with City employees that demonstrates how to reduce energy consumption in the workplace.

SELECT THE GOAL ICON TO RETURN TO THE SUMMARY PAGE

INCREASE ENERGY EFFICIENCY OF EXISTING BUILDINGS OR FACILITIES

B2. ACHIEVE LEVEL 3+ AIRPORT CARBON ACCREDITATION AT LOVE FIELD FOR CARBON NEUTRAL OPERATIONS, MAINTAIN ACCREDITATION FOR DFW AND PURSUE FOR DALLAS EXECUTIVE AIRPORT.

ACTION TYPE
Program, Partnership
ACTION SOURCE
Ongoing Action

PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Cost savings

The Airport Carbon Accreditation program is an international reporting framework that supports airports in consistently and transparently reducing their operational emissions. Dallas has already achieved Level 2 accreditation at Love Field after developing an airport operational carbon footprint (Level 1), and then setting and achieving carbon reduction targets (Level 2).

The City will include emissions from third-party operators (e.g., retail tenants, catering companies) in their carbon footprint and engage with those operators to reduce their emissions.

The City will also incorporate solar panels on airport garages, as feasible, and then acquire carbon offsets for any remaining emissions sources over which the airport has control to achieve Level 3+ accreditation. Dallas Fort Worth Airport has already achieved a three-year Level 3+ accreditation through 2021, and the City will work with DFW to maintain this accreditation into the future.

The City will also pursue Airport Carbon Accreditation at Dallas Executive Airport.

INCREASE ENERGY EFFICIENCY OF EXISTING BUILDINGS OR FACILITIES

B3. DEVELOP CLEAR AND COMPREHENSIVE EDUCATIONAL PROGRAM FOR BUILDING OWNERS AND TENANTS ABOUT EXISTING ENERGY EFFICIENCY PROGRAMS.

ACTION TYPE
Program Partnership

ACTION SOURCE
Ongoing Action

PRIMARY BENEFIT

Mitigation

CO-BENEFITS

Cost Savings, Education, Inequality

The City will develop a building energy retrofit landing page on its website to share links to available financial resources (e.g., through Oncor, Dallas County Health and Human Services (DCHHS), the Texas LoanSTAR program, and the City's (PACE) financing program). It will also partner with community and neighborhood organizations to develop an outreach strategy that promotes these opportunities to all segments of the community. The engagement campaign will connect lower-income residents, the senior community, and non-native English households and businesses with technical assistance and tailored information on energy efficiency programs.

The City will also evaluate options to develop an Energy Resource Center, either through a City department or in partnership with an outside organization/agency. The center would help property owners find qualified contractors or service providers, understand the steps needed to achieve a high-efficiency building, and provide case studies and information on financial resources. The Energy Resource Center could also implement specific educational campaigns associated with the roll-out of various City programs, including residential building energy audits, commercial benchmarking, and zero-net energy development.

EQUITY CONSIDERATIONS

- Household utility cost savings will benefit vulnerable residents, including low-income households who on average spend a higher proportion of their income on energy.
- Focused engagement with vulnerable populations can address barriers in access to financial and technical assistance programs due to income, education, age, English proficiency, etc.

INCREASE ENERGY EFFICIENCY OF EXISTING BUILDINGS OR FACILITIES

B4. IMPLEMENT A CITYWIDE BUILDING WEATHERIZATION PROGRAM THROUGH PARTNERSHIP WITH COMMUNITY ORGANIZATIONS.

ACTION TYPE
Partnership; Educational

ACTION SOURCE
Ongoing Action

PRIMARY BENEFIT

Mitigation

CO-BENEFITS

Cost savings, Education, Inequality, Public health

DCHHS currently implements a weatherization program for income-eligible households in the county.[14] In partnership with Dallas County, the City will implement a weatherization program for the city's vulnerable residents to improve energy efficiency and reduce utility costs. The City will identify funding to support a direct-install program for weather stripping, caulking, insulation, window and door repair, solar screens, heating and cooling unit repair/retrofits, and duct work. The City will also identify partnership opportunities with community organizations to help recruit program participants and assist in program implementation.

The weatherization program will include development of engagement programs to reach lower-income residents and the senior community, including Dallas' non-native English households, to provide them with a clear understanding of participation benefits and financial or other resources available.

EQUITY CONSIDERATIONS

- Weatherization will provide household utility cost savings that benefit low-income residents, who on average spend a higher proportion of their income on energy.
- Focused engagement with vulnerable populations can address barriers in program participation due to income, education, age, English proficiency, etc.

INCREASE ENERGY EFFICIENCY OF EXISTING BUILDINGS OR FACILITIES

B5. IDENTIFY NEW FINANCING MECHANISMS TO ACCELERATE ENERGY EFFICIENCY IMPROVEMENTS IN EXISTING BUILDINGS.

ACTION TYPE
Incentive

ACTION SOURCE
New Action

PRIMARY BENEFIT

Mitigation

CO-BENEFITS

Cost savings, Education, Inequality

The cost to implement building energy upgrades is the largest barrier to action and the demand for financial rebates and incentive programs for building energy retrofits often far exceeds available resources. Therefore, the City will explore alternative financing mechanisms or partnerships that will support accelerated retrofits in the existing building stock. Part of this effort will include expanding participation in the City's existing PACE financing program. This program provides long-term financing for non-residential and multi-family residential energy and water efficiency upgrades, allowing improvements to be paid for with lower operating costs.

The City will also identify seed funding resources or strategies to support the development of a building retrofit revolving loan fund that would be available to residential property owners, among others. The revolving loan fund could also potentially be used to reduce, or offset costs associated with building energy audits (see Action B8), which can help to increase property owners' understanding of cost-effective efficiency improvement opportunities; the loan fund could then help to finance the retrofit opportunities identified.

EQUITY CONSIDERATIONS

- Household utility cost savings will benefit vulnerable residents, including low-income households who on average spend a higher proportion of their income on energy.
- Focused engagement with vulnerable populations can address barriers in access to financial and technical assistance programs due to income, education, age, English proficiency, etc.

INCREASE ENERGY EFFICIENCY OF EXISTING BUILDINGS OR FACILITIES

B6. ESTABLISH A BUILDING EFFICIENCY AND ELECTRIFICATION PROGRAM (FOR EXISTING BUILDINGS) TO REPLACE APPLIANCES AND SYSTEMS WITH ELECTRIC AND OTHER EFFICIENT AND COST EFFECTIVE OPTIONS.

ACTION TYPE
Incentive

ACTION SOURCE
New Action

PRIMARY BENEFIT

Mitigation

CO-BENEFITS

Air Quality

The City will partner with electric utility companies to develop a building electrification program that helps residents and businesses to replace natural gas-powered equipment and appliances with high-efficiency electric options. The program will provide information, technical assistance, and financial incentives to replace equipment, such as boilers and furnaces, hot water heaters, and stoves with electric alternatives (which will help reduce emissions over time).

The City can also coordinate with building trade organizations to ensure local contractors are trained to provide high-quality installations of electric heating and cooling systems, such as air source heat pumps.

The City will also work with the gas utility on an energy efficiency program to ensure that any replacement gas appliances (where an electric alternative is not technically or financially feasible) are as highly efficient as possible.

EQUITY CONSIDERATIONS

- Focused engagement with disadvantaged populations can address barriers in access to financial and technical assistance programs due to income, education, age, English proficiency, etc.

INCREASE ENERGY EFFICIENCY OF EXISTING BUILDINGS OR FACILITIES

B7. INCREASE PARTICIPATION AND SCOPE OF THE DALLAS GREEN BUSINESS CERTIFICATION PROGRAM.

ACTION TYPE
Educational
ACTION SOURCE
Ongoing Action

PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Cost savings, Education, Resource consumption

The City's Green Business Certification Program recognizes local businesses that incorporate green practices into their operations to reduce waste, conserve energy, and save water. The City will partner with Dallas' various Chambers of Commerce to increase awareness of and participation in the program by their members. To increase program visibility, the City will develop and post short case studies of successes achieved by members' businesses on the City's website. The City will increase the scope of the certification program to include more sustainable practices. Additionally, the City can use this program as an opportunity to pilot other CECAP actions and evaluate the results before implementing strategies citywide.

INCREASE ENERGY EFFICIENCY OF EXISTING BUILDINGS OR FACILITIES

B8. IMPLEMENT A BETTER BUILDINGS CHALLENGE THAT EXPANDS THE 2030 DISTRICT GOALS BEYOND DOWNTOWN DALLAS.

ACTION TYPE
Partnership
ACTION SOURCE
New Action

PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Cost savings

The Dallas 2030 District initiative is designed to achieve high-performance building construction and operation in the downtown area, with goals to reduce energy and water use as well as transportation emissions. The City will expand this ambitious concept beyond downtown Dallas through collaboration with large commercial building operators, such as manufacturers, universities, and hospitals. The City will encourage participants to improve their building energy efficiency by at least 40% by 2030, and share resources on incentives, financing options and technical service providers. The City will also share success stories and feature participant profiles on the City's website.

As a step toward developing a commercial energy benchmarking and disclosure ordinance (see Action B10), the City will work with participants in the Better Buildings Challenge to pilot test different aspects of such a program, including how the program would apply to various building sizes and different reporting methods (e.g., directly to the City, through online programs such as ENERGY STAR Portfolio Manager).

Participation in this pilot test would be voluntary and would help the City to refine its approach to energy benchmarking. During the pilot testing process, the City will convene meetings with stakeholder groups, including building owners/managers and real estate industry trade groups, to discuss the benefits of such a program and collect input on how to it can be successfully implemented citywide. This engagement process will help establish support for such a program now and in the future.

INCREASE ENERGY EFFICIENCY OF EXISTING BUILDINGS OR FACILITIES

B9. ESTABLISH A POINT-OF-SALE/POINT-OF-LEASE HOME ENERGY RATING AND DISCLOSURE EDUCATIONAL PROGRAM FOR SINGLE-FAMILY BUILDINGS.

PRIMARY BENEFIT

Mitigation

CO-BENEFITS

Education

ACTION TYPE
Educational
ACTION SOURCE
New Action

The City will take a phased approach to reducing residential building emissions. Understanding a home's energy rating prior to purchase or lease allows consumers to consider energy efficiency and its impact on utility costs in their decision making.

As a first step, the City will work with the local real estate community to develop an educational program that provides information on building energy audits to new home buyers. The information will explain what an energy audit is, how they are conducted, how the results can inform cost-effective efficiency improvements, and where homebuyers can find information on certified audit professionals and possible rebates or incentives. Implementation of home energy audits can also contribute to local green job development and/or training programs to meet the new demand.

The second step will be implemented at a future date. The City will adopt an ordinance that requires home energy rating disclosure at the point of sale or lease for single-family buildings. Sellers would be required to have a Home Energy Rating System (HERS) evaluation prepared for their home and made available to interested buyers/tenants. The City would identify exemptions, alternative compliance strategies, or financial resources to reduce the burden on lower-income households. As with home energy audits, promotion of home energy ratings will also contribute to local green job opportunities.

As a third step, the City will adopt a Residential Energy Conservation Ordinance (RECO) that requires residential property owners to install energy conservation measures in their buildings at the point of property sale or lease. The City will establish RECO requirements that include either a building efficiency threshold that must be met through installation of building improvements chosen by the building owner or a checklist of mandatory installations. The City will also establish maximum expenditure limits for compliance and identify exemptions, alternative compliance strategies, or financial resources to reduce the burden on lower-income households. Requiring energy efficiency improvements in homes will also contribute to job growth among the building trades.

EQUITY CONSIDERATIONS

- Information on home energy efficiency can help vulnerable populations to compare the utility cost savings potential of various housing options.
- Overall energy efficiency of existing housing stock will increase, leading to lower utility bills for occupants (step 3).
- At each step, the City will evaluate the cost implications of these revisions to low income households and consider subsidy programs or other financial support mechanisms to ensure affordability and equitable participation.

INCREASE ENERGY EFFICIENCY OF EXISTING BUILDINGS OR FACILITIES

B10. PREPARE FOR THE IMPLEMENTATION OF A BENCHMARKING AND DISCLOSURE ORDINANCE FOR COMMERCIAL BUILDINGS.

PRIMARY BENEFIT

Mitigation

CO-BENEFITS

Cost savings

ACTION TYPE
Educational; Mandate
ACTION SOURCE
New Action

The City will take a phased approach to reducing commercial building emissions. Successful implementation of this action will require an education campaign for the real estate and property management community in Dallas, with emphasis on commercial landlords, to explain the purpose and benefits of benchmarking and the process of reporting results. The City can also leverage informational resources from similar programs in other cities, including Austin. As described in Action B8, implementation of this program will begin with a voluntary pilot program through the Better Buildings Challenge focused on the Central Business District. Participant and stakeholder feedback will help design the specifics of a citywide benchmarking and disclosure ordinance.

Following the initial information campaign and pilot test through the Better Buildings Challenge, Step 1 of this action will include adopting a commercial benchmarking and disclosure ordinance to establish a baseline understanding of buildings' energy efficiency relative to buildings of similar type and size. The City will define building size thresholds for participation that can be reduced over time to phase in implementation of this program. Initial implementation will begin with large commercial buildings to minimize impacts on small businesses.

Over time, the program can be modified to increase requirements. Step 2 will include developing a commercial building energy performance ordinance that requires energy audits or retro-commissioning for buildings. This will help to identify specific cost-effective improvements that building managers can take to reduce operational costs. Step 3 could include establishing energy use or emissions targets.

ENSURE THAT NEW BUILDINGS ARE CONSTRUCTED SUSTAINABLY AND ARE CARBON NEUTRAL.

B11. UPDATE THE BUILDING CODE TO REQUIRE WIRING CONDUITS FOR SOLAR PHOTOVOLTAICS AND ELECTRIC VEHICLE CHARGING INFRASTRUCTURE IN NEW CONSTRUCTION.

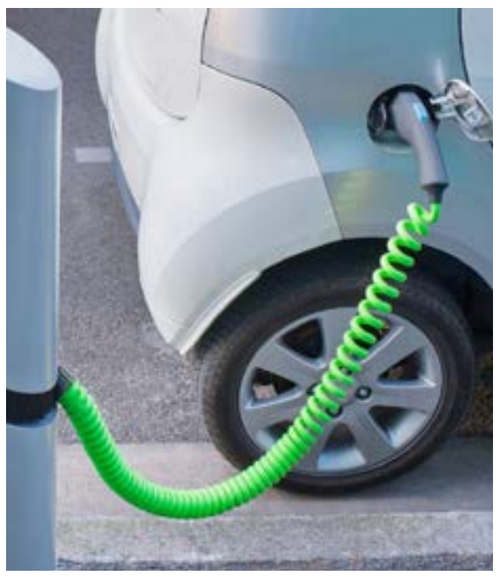
PRIMARY BENEFIT

Mitigation

CO-BENEFITS

Adaptation

ACTION TYPE
Mandate
ACTION SOURCE
New Action



Designing solar-ready and EV-ready buildings is a low-cost strategy to encourage adoption of these technologies. Dallas already adopts and implements various building codes, including the IECC, to guide building construction and renovations. The 2018 IECC includes appendices that are not mandatory unless specifically adopted by cities, including Appendix CA Solar Ready Zone (commercial buildings) and RA Solar Ready Provisions (residential buildings). These appendices describe provisions to make buildings solar-ready, including accommodations for solar equipment, piping, and wiring, to encourage future installation of renewable energy systems. The City will adopt these appendices in the next building code update to support solar-ready construction. At the same time, the City will also include EV infrastructure requirements for new construction, including pre-wiring and electrical capacity, to accommodate future EV charging points.

EQUITY CONSIDERATIONS

- Solar ready construction could reduce utility costs for vulnerable residents when paired with financial programs to support installation of rooftop solar.

ENSURE THAT NEW BUILDINGS ARE CONSTRUCTED SUSTAINABLY AND ARE CARBON NEUTRAL.

B12. EVALUATE AND CONSIDER A ZERO NET ENERGY (ZNE) CODE FOR ALL NEW BUILDINGS AND SUBSTANTIAL RENOVATIONS BY 2030.

PRIMARY BENEFIT

Mitigation

CO-BENEFITS

Air Quality Cost savings

ACTION TYPE
Plan; Assessment
ACTION SOURCE
New Action

Zero Net Energy (ZNE) buildings have a high-efficiency design that minimizes energy demand and produces as much energy as consumed over the course of a year. To guide energy efficiency in new construction and renovations, Dallas adopts and implements building codes, including the IECC.

The City will evaluate its options to adopt different building energy codes in the future, if IECC updates do not provide a pathway toward ZNE buildings. The City will consider alternative code options to achieve ZNE objectives, such as Architecture 2030's Zero Code. The City will aim to implement a ZNE building code starting in 2030 for new construction and will identify ways to incentivize, early voluntary achievement of this goal.

The City will also promote the concept of net zero neighborhoods to achieve the goals of this action on a larger scale. The City will work with developers and home builders to identify potential opportunities for pilot sites. For example, redevelopment of the Hensley Field Site can be considered an opportunity to develop a carbon neutral district where buildings are designed and constructed to achieve ZNE standards, including development of in-district renewable energy systems. This project could then serve as a best practice example of Dallas' leadership and innovation, and as a demonstration project for other Dallas area developments to highlight the feasibility and lessons learned.

EQUITY CONSIDERATIONS

- ZNE building requirements could increase the cost of new construction and pose a barrier to new affordable housing development. The City will evaluate the cost implications for these new low-income housing developments along with an estimate of the return on investment. While the up-front cost may be slightly higher than existing, the significantly reduced ongoing energy costs would benefit low-income residents.

INCREASE CLIMATE RESILIENCE FOR NEW AND EXISTING BUILDINGS THROUGH STRUCTURAL AND OPERATIONAL IMPROVEMENTS.

B13. ESTABLISH URBAN GREENING FACTOR REQUIREMENTS FOR NEW DEVELOPMENTS THAT QUANTIFY HOW PROJECTS CONTRIBUTE TO URBAN GREENING FOR REDUCED STORMWATER RUNOFF AND URBAN HEAT ISLAND IMPROVEMENTS.

ACTION TYPE
Mandate

ACTION SOURCE
New Action

PRIMARY BENEFIT
Environmental Quality

CO-BENEFITS
Emissions Reduction, Adaptation, Air Quality, Water Quality, Public Health, Cost Savings

Vegetation and green space help to reduce and/or slow stormwater runoff (and therefore flooding) and can reduce urban heat islands, provide wildlife habitat, and provide other social and environmental benefits. The City will establish urban greening factor requirements for new developments around rainwater infiltration that will ensure a minimum level of runoff reduction and "greening" is achieved in the city. Guidance will be provided around the range of urban greening options are available, such as planting street trees, installing green roofs, or incorporating rain gardens; each has a different greening factor based on its potential for rainwater infiltration. The City will partner with stakeholder groups, including neighborhood organizations and the development community, to define urban greening factor thresholds for different project types (e.g., residential, commercial).

EQUITY CONSIDERATIONS

- If a pilot of this urban greening factor is required, a low-income community that is currently devoid of permeable surfaces or street greening will be prioritized as the pilot.

B14. PROMOTE PASSIVE BUILDING DESIGN (E.G., ORIENTATION, SHADING DEVICES) THROUGH THE CITY'S ZONING ORDINANCE AND DESIGN STANDARDS.

ACTION TYPE
Educational

ACTION SOURCE
New Action

PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Adaptation, Cost Savings

Passive building design reduces energy consumption and improves occupant comfort by optimizing a building's heat gain and losses. The City will identify opportunities to reinforce passive design principles through its zoning ordinances and design standards, including use of building-integrated shading devices that block solar radiation in summer months while allowing it in winter months. The City will also partner with the local green building industry to identify examples of effective passive building design in and around the Dallas region and share case studies on the City's website.

EQUITY CONSIDERATIONS

- Household utility cost savings will benefit low-income residents, who on average spend a higher proportion of their income on energy.

INCREASE CLIMATE RESILIENCE FOR NEW AND EXISTING BUILDINGS THROUGH STRUCTURAL AND OPERATIONAL IMPROVEMENTS.

B15. EVALUATE POTENTIAL CITY-OWNED PROPERTIES FOR THE CREATION OF 'RESILIENCE HUBS'.

ACTION TYPE
Assessment

ACTION SOURCE
New Action

PRIMARY BENEFIT
Adaptation

CO-BENEFITS
Cost Savings, Inequality, Public Health

Major storm events that disrupt electricity services in a community for a long period of time can present a safety challenge if power outages also impact the City's fire, police, and emergency response services. Resilience hubs are part of a strategy to disperse stormproof facilities across a community that can provide an independent source of power to serve multiple community needs.

Resilience hubs are designed to provide emergency heating and cooling services; support refrigeration of temperature-sensitive medications; or offer residents a place to recharge cell phones or computer batteries during a grid outage. Resiliency hubs can also serve as the base of operations for first responders or other critical service providers during power outages.

The City will identify potential resilience hub locations that can be developed to establish a citywide network that serves Dallas' various communities. Buildings identified as candidates should be fitted with solar photovoltaics and battery storage systems and/or connected to a microgrid to ensure reliable access to power during storm events.

EQUITY CONSIDERATIONS

- Resilience hubs located in vulnerable communities can provide access to emergency services, including heating/cooling and electricity for phone charging, for residents who may not have backup generators for storm events.

INCREASE ENERGY EFFICIENCY OF EXISTING BUILDINGS OR FACILITIES

B16. ENCOURAGE BUILDING OWNERS TO SUBMETER THEIR BUILDINGS TO SUPPORT INCREASED ENERGY CONSERVATION.

ACTION TYPE
Educational

ACTION SOURCE
New Action

PRIMARY BENEFIT

Mitigation

CO-BENEFITS

Cost Savings

Education

Utility submetering allows property owners to bill tenants for their individually measured utility usage (e.g., electricity, gas, or water). Submetering can reduce costs by allowing commercial or multifamily properties to accurately bill units for consumption which drives energy-related behavioral change. Submetering enables the improved performance of new and existing buildings by providing the transparency needed to enable more efficient management of energy in operations and maintenance.

The City will provide an educational program for commercial and multifamily properties that explains what submetering is, its financial and environmental benefits, and how it could prepare them to meet future building code requirements. The program will also include resources on companies that provide submetering services. This program can be promoted through the proposed Energy Resource Center as outlined in Action B3.

EQUITY CONSIDERATIONS

- Submetering properties could align utility costs more accurately with tenant usage and reduce usage and costs over time.

GOAL 2: DALLAS GENERATES AND USES RENEWABLE, RELIABLE, AND AFFORDABLE ENERGY.

Why Energy Matters p. 69

Building on City Achievements p. 71

What can I do? p. 72

Actions p. 73

TARGETS

739,000 MWH AND 3,695,000 MWH SOLAR POWER INSTALLED WITHIN THE CITY BY 2030 AND 2050, RESPECTIVELY.

20% AND 50% OF ALL DALLAS RESIDENTS AND BUSINESSES ENROLL IN RENEWABLE ELECTRICITY PLANS BY 2030 AND 2050, RESPECTIVELY.

WHY ENERGY MATTERS

Dallas' residents have witnessed the impacts of extreme weather on the grid. Severe storms can uproot trees and tear down power lines. Dallas experienced multiple events in 2019 that left residents and businesses without power for days, which can have significant economic, as well as public health implications. Dallas primarily relies on electricity that has been generated by fossil fuels (20% is generated from coal and 48% from natural gas) (**Figure 21**). Although Texas is the largest producer of wind in the country, renewable energy (solar, wind and other renewables) only provides 22% of the grid electricity mix. Due to the hot climate and use of air conditioning for many months of the year, air conditioning accounts for a much larger share of home energy use, than space heating when compared to the U.S. average (18% in Texas compared with 6% in the U.S).[15] Texas households consume an average of 77 million Btu per year, about 14% less than the U.S. average.[16]

The renewable energy market is growing globally, as technologies (particularly photovoltaic panels and batteries) become more affordable and adaptable. With an average of 234 days of sunshine per year, Dallas has the potential to take much more advantage of solar technologies. **Figure 22** illustrates the potential energy captured using roofs on existing buildings. Texas' unique energy market makes it difficult for cities to directly regulate this sector. In 1999, the Texas legislature de-regulated the retail electricity market, which led to Dallas being serviced by over 115 retail electricity providers. Some of these electricity providers allow customers

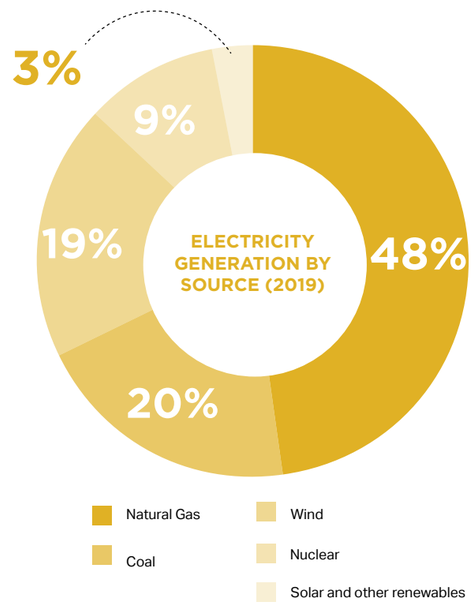


Figure 21: Electricity generation by source
Source: ERCOT 2019

to purchase 100% renewable electricity at rates competitive with other retailers, which provides an opportunity for the City to indirectly influence electricity sector emissions. While in the future ERCOT is likely to continue to change its energy generation sources to include a growing share of renewable energy, residents and businesses have the option to choose renewable energy sources today from their electricity provider, which can help to speed up decarbonization in the energy sector.

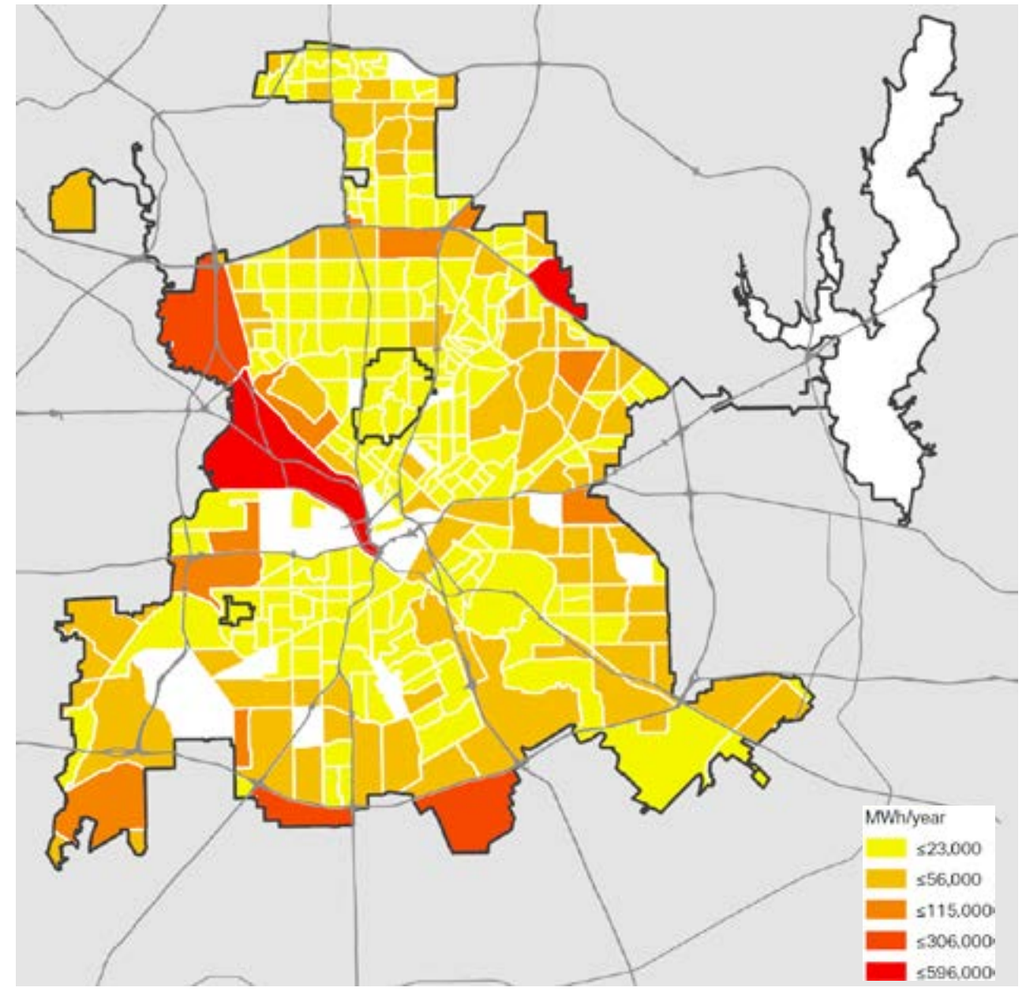


Figure 22: Citywide solar energy capture potential
Estimated solar installation potential based on rooftop area suitable for solar panels
Source: Data from Google's sunroof 2020

Solutions in the energy sector primarily focus on encouraging the use of, and investment in renewable energy through partnerships, incentives, educational programs and advocacy at the state and national levels.

BUILDING ON CITY ACHIEVEMENTS

The City of Dallas achieves 100% renewable electricity usage through the purchase of renewable energy credits (RECs). Dallas has had a de facto renewable energy policy in place since at least 2008 when the City began purchasing renewable energy offsets (offsetting 40% of its electricity usage). This increased to 50% in October 2015 and to 100% in January 2017. The City formally adopted the Dallas Green Energy Policy in April 2019. The City has also implemented solar energy at seven municipal facilities with about 586 KW in solar capacity.

The City ranked 2nd in EPA's Green Power Partnership Top 30 Local Government list in 2019. The list represents the largest green power users among local government partners. The City of Dallas ranks 17th in EPA's Green Power Partnership National Top 100 list.

The National Top 100 list represents the largest green power users within the Green Power Partnership.[17]
A Green Energy policy was implemented in May 2019 in alignment with the CECAP by formalizing the purchasing of RECs, guiding development of an energy management system and procurement strategy, and supporting the development of on- and off-site generation.

The Dallas Green Energy Policy:
The City of Dallas is committed to clean and efficient energy use and the commitment is embodied by our use of 100% renewable energy for municipal operations. The City of Dallas further recognizes the advantage presented by green energy produced by on- and off-site renewable energy projects. Accordingly, the City will seek to sustain and promote renewable energy projects and partnerships that reduce emissions and environmental impacts for the benefit of Dallas residents and the region.[18]

WHAT CAN I DO?

Residents

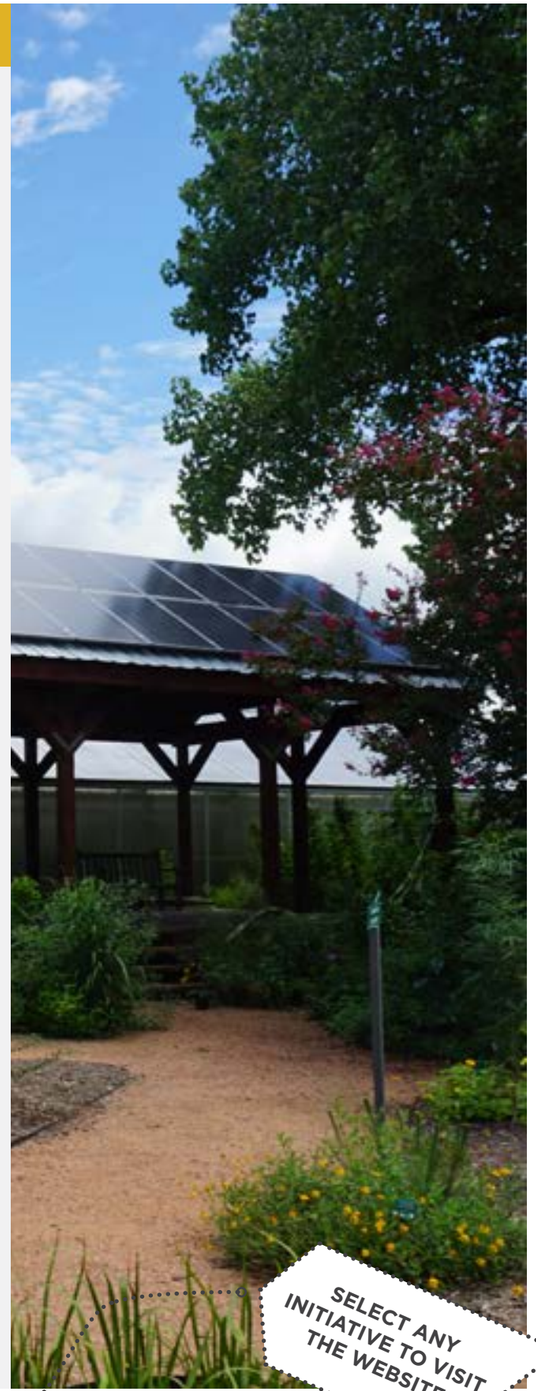
01 Homeowners within the Oncor service area can make use of the **Solar Residential Program** to help offset the initial cost of installing solar panels — once installed, you may even receive credit for excess generation your system produces!

02 Use the Texas Public Utility Commission's **Power to Choose** website to evaluate your electricity provider options and select a provider with a higher proportion of renewable energy (potentially at low or no extra cost).

Businesses

01 Qualifying business and commercial property owners within the Oncor service area can use the Basic Commercial Program to **help fund new solar panels**.

02 Use the Texas Public Utility Commission's **Power to Choose** website to select a provider with a higher proportion of renewable energy and then notify customers of your commitment to clean energy.



SELECT ANY INITIATIVE TO VISIT THE WEBSITE

COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN

SELECT ANY ACTION TO SKIP DIRECTLY TO THAT PAGE

02 Dallas generates and uses renewable, reliable, and affordable energy.

Maintain a high degree of reliability during extreme weather events.

- Maintain a high degree of reliability in the electric delivery grid through cooperative actions between the City and Public Utility Companies.
- Evaluate the potential for the City to make investments in energy storage technologies for both resilience and renewable energy development purposes.
- Educate commercial power users about power savings associated with demand side management.

Encourage investment in, and greater use of, renewable energy.

- Continue partnership with Public Utility Companies on an intensive education program on renewable energy options.
- Invest in programs through local community colleges to train and establish a local workforce that is focused on renewable energy technologies.
- Build a regional strategic partnership to promote adoption of renewable energy.
- Establish and invest in renewable energy hubs through partnerships with private sector.
- Extend City efforts to develop more renewable energy projects on City facilities.
- Continue to implement Green Energy policy for City facilities.

Ensure affordable access to renewable electricity.

- Extend partnership with organizations like PACE and other Public Utility Companies to provide further incentives for renewable energy.
- Advocate for Renewable Energy Policies at the State and Federal levels.

MAINTAIN A HIGH DEGREE OF RELIABILITY DURING EXTREME WEATHER EVENTS

E1. MAINTAIN A HIGH DEGREE OF RELIABILITY IN THE ELECTRIC DELIVERY GRID THROUGH COOPERATIVE ACTIONS BETWEEN THE CITY AND PUBLIC UTILITY COMPANIES.

ACTION TYPE
Partnership
ACTION SOURCE
Ongoing Action

PRIMARY BENEFIT
Adaptation

CO-BENEFITS
Public Health

One of the major impacts of climate change in the Dallas region is the potential for a greater number of more intense storms. Significant damage to the electric grid can occur under these circumstances. The City will work with public utility companies to assist them in making the necessary improvements to the grid. One option is to bury electric lines, especially in areas that are highly susceptible to high winds and storms (heavily wooded areas), and/or carry out sensitive tree trimming.

E2. EVALUATE THE POTENTIAL FOR THE CITY TO MAKE INVESTMENTS IN ENERGY STORAGE TECHNOLOGIES FOR BOTH RESILIENCE AND RENEWABLE ENERGY DEVELOPMENT PURPOSES.

ACTION TYPE
Partnership
ACTION SOURCE
New Action

Adaptation

Cost Savings

Emissions Reduction

Energy storage technologies such as batteries provide multiple benefits. They can be used to provide emergency electricity supply in the case of grid outage during major storm events for critical facilities. They can improve the cost benefit of renewable energy technologies through improving the continuity of service (for example for a solar powered system to provide power even when it is cloudy). Finally, major energy consumers can use storage to take advantage of time-of-day rates. Energy can be purchased at night when rates are low, then used during the day when rates are high.

Oncor has a demonstration project south of downtown Dallas called Oncor Electric Technology Demonstration & Education Center (TDEC). The City will evaluate opportunities to duplicate the technology for energy storage and microgrid installation for critical buildings such as emergency service buildings (fire, police, hospitals, emergency management centers) or community facilities such as recreation centers that could act as community resilience hubs during a disaster. (See action B15.) The City will also consider expanding a storage program to include collaborative projects between the City and the private sector.

EQUITY CONSIDERATIONS

- Pilot microgrids and resilience hubs should be prioritized to first serve neighborhoods with vulnerable communities.

ENCOURAGE INVESTMENT IN, AND GREATER USE OF, RENEWABLE ENERGY.

E3. CONTINUE PARTNERSHIP WITH PUBLIC UTILITY COMPANIES ON AN INTENSIVE EDUCATION PROGRAM ON RENEWABLE ENERGY OPTIONS.

ACTION TYPE
Educational; Incentives; Partnership
ACTION SOURCE
New Action

PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Employment

Cost Savings

Education

There are significant changes taking place in the energy sector including opportunities for implementing small scale renewable energy systems and associated financing options. The changes affect both the residential and commercial sectors. Given that over two thirds of the energy consumed in the city is from the commercial, industrial and institutional sectors, the City will focus a significant part of its education program on this sector, highlighting the cost savings, demand side management practices and other benefits gained from installing on-site renewables and from purchasing a renewable energy electricity contract. The City will also partner with local utilities, the PACE program, educational institutions, and other stakeholders to participate in the public information program. The public information campaign would use multiple channels, including social media, to reach a wide range of audiences. Note that this program on renewable energy would complement energy efficiency emphasis in the buildings' education campaign.

In addition to promoting the existing incentive programs and financing options for renewable energy systems, the City and its partners will explore new financing opportunities such as grants and subsidies.

EQUITY CONSIDERATIONS

- Ensure outreach campaigns and materials are available in multiple languages and are culturally appropriate.
- Focused engagement with vulnerable populations can address barriers in access to financial and technical assistance programs due to income, education, age, English proficiency, etc.

ENCOURAGE INVESTMENT IN, AND GREATER USE OF, RENEWABLE ENERGY.

E4. INVEST IN PROGRAMS THROUGH LOCAL COMMUNITY COLLEGES TO TRAIN AND ESTABLISH A LOCAL WORKFORCE THAT IS FOCUSED ON RENEWABLE ENERGY TECHNOLOGIES.

PRIMARY BENEFIT

Mitigation

CO-BENEFITS

Employment, Education

ACTION TYPE
Educational; Partnership
ACTION SOURCE
Ongoing Action

Recognizing that the development of renewable technologies represents a new opportunity for workforce development, the City will partner with local community colleges such as Dallas County Community College District and related non-profit organizations to train and place individuals in this industry. Local community colleges have already initiated sustainability programs including training in renewable energy technologies. The City will assist in creating a demand for careers in renewable energy and support the program by considering, for example, work placements on the installation and maintenance of renewable systems on city property.

EQUITY CONSIDERATIONS

- This program could provide job opportunities for those currently underemployed in the workforce.
- The program should prioritize participants from low income communities when recruiting.

Credit: Kristian Buus (CC BY 2.0)

ENCOURAGE INVESTMENT IN, AND GREATER USE OF, RENEWABLE ENERGY.

E5. BUILD A REGIONAL STRATEGIC PARTNERSHIP TO PROMOTE ADOPTION OF RENEWABLE ENERGY.

PRIMARY BENEFIT

Mitigation

CO-BENEFITS

Employment, Education

ACTION TYPE
Partnership
ACTION SOURCE
New Action

The City will take the lead in setting up a regional strategic partnership with other public sector agencies including North Texas Counties, and school districts, as well as local universities, to increase investment in renewable energy projects (and associated energy conservation).

A technical advisory committee would facilitate the policy making process.

E6. ESTABLISH AND INVEST IN RENEWABLE ENERGY HUBS THROUGH PARTNERSHIPS WITH THE PRIVATE SECTOR.

PRIMARY BENEFIT

Mitigation

CO-BENEFITS

Employment, Cost Savings, Adaptation

ACTION TYPE
Partnership
ACTION SOURCE
New Action

Building on Action E2 to evaluate the potential for energy storage and solar powered microgrids, the City will evaluate opportunities to establish "Renewable Energy hubs," that focus investments in renewable energy and energy storage through public-private partnerships.

The City will work with the business community to understand the institutional and contractual requirements to form such a partnership for the joint development of solar or other types of renewable projects. The project could serve as a model for larger scale investments in solar energy. The City will evaluate funding opportunities from organizations such as the State Energy Office and other agencies.

ENCOURAGE INVESTMENT IN, AND GREATER USE OF, RENEWABLE ENERGY.

E7. EXTEND CITY EFFORTS TO DEVELOP MORE RENEWABLE ENERGY PROJECTS AT CITY FACILITIES.

ACTION TYPE
Program
ACTION SOURCE
Ongoing Action

PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Cost Savings

Aligned with Action B1 to develop a carbon neutrality plan, the City will identify further suitable locations for photovoltaic panel installations on its facilities. As a local demonstration project, the City will consider a solar energy project on suitable, under-utilized city-owned land that has little opportunity for future development, such as a brownfields site or closed landfills. The City of Houston's Sunnyside Energy project on a landfill is a good example of a similar project). Other opportunities include expanding the existing City's Southside treatment facility and McCommas Bluff renewable energy projects.

The City will develop case studies outlining the cost-benefits gained from its own renewable energy projects to encourage other installations. This information could be used in the education campaign as part of Action E3.

E8. CONTINUE TO IMPLEMENT GREEN ENERGY POLICY FOR CITY FACILITIES.

ACTION TYPE
Policy
ACTION SOURCE
Ongoing Action

PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Cost Savings

The City of Dallas began offsetting its electricity consumption through renewable energy credits in 2008. In January 2017, it increased its offsets for municipal facilities to 100%.[19] The City will continue to implement the Green Energy Policy and identify further opportunities for partnerships that can facilitate implementation of on-site and off-site renewable energy projects.

ENSURE AFFORDABLE ACCESS TO RENEWABLE ELECTRICITY

E9. EXTEND PARTNERSHIP WITH ORGANIZATIONS LIKE PACE AND OTHER PUBLIC UTILITY COMPANIES TO PROVIDE FURTHER INCENTIVES FOR RENEWABLE ENERGY.

ACTION TYPE
Incentive; Educational
ACTION SOURCE
Ongoing Action

PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Employment
Education
Inequality
Cost Savings

The City will partner with local utilities, the State Energy Office, trusted community organizations (e.g., Habitat for Humanity) and financial institutions to provide financial resources for greater investment in renewable energy.

The City will explore opportunities to leverage existing programs such as financial incentives provided by public utility companies and PACE. The program should specifically look to new economic development opportunities for tying innovative energy solutions with future development projects. As part of this approach, traditional economic development incentives (such as local tax abatements) could be prioritized to projects that incorporate renewable energy resources as part of their development. Financial incentives for renewables should focus on low-income populations, after energy conservation measures have been implemented.

EQUITY CONSIDERATIONS

- Partner with trusted allies in reaching out to low-income communities to ensure greater acceptance.
- Ensure outreach campaigns and materials are available in multiple languages and are culturally appropriate.

ENSURE AFFORDABLE ACCESS TO RENEWABLE ELECTRICITY

E10. ADVOCATE FOR RENEWABLE ENERGY POLICIES AT THE STATE AND FEDERAL LEVELS.

PRIMARY BENEFIT

Mitigation

CO-BENEFITS

ACTION TYPE
Advocacy

ACTION SOURCE
Ongoing Action

State and federal policies have had a significant impact on the development of wind and solar energy resources. This has been accomplished through tax policies at the federal level and through the Texas Renewable Energy Portfolio Standards. Federal production tax credits for wind will expire in 2020. Solar energy investment tax credits are 26% in 2020 but will decrease to 22% in 2021 and 10% in 2022.

Through U.S. Climate Mayors, the City will advocate for federal policies that facilitate decarbonizing the U.S. power sector. The City will work with other Texas mayors to advocate the state legislature to increase the Texas Renewable Portfolio Standard to 80% zero-carbon electricity by 2050.

These policies may include incentives provided by electric utilities; statewide building code standards making renewables more accessible; increases in the REPS (while maintaining a high degree of system reliability; and state and federal investments in renewable energy and energy storage technologies).

SELECT THE GOAL ICON TO RETURN TO THE SUMMARY PAGE

MAINTAIN A HIGH DEGREE OF RELIABILITY DURING EXTREME WEATHER EVENTS

E11. EDUCATE COMMERCIAL POWER USERS ABOUT POWER SAVINGS ASSOCIATED WITH DEMAND SIDE MANAGEMENT.

PRIMARY BENEFIT

Mitigation

CO-BENEFITS

Adaptation

Cost Savings

ACTION TYPE
Partnership

ACTION SOURCE
Ongoing Action

A demand response program encourages customers to reduce their electricity consumption in response to either high energy prices or system reliability risks. Such programs provide an incentive for building owners and tenants to help increase grid reliability and reduce system-wide energy costs.

Currently, commercial properties in Dallas can participate in Oncor's Commercial Load Management Program (CLM). This program is designed to cost-effectively reduce energy demand during the summer peak period while assisting in reaching the demand savings goal established by the Public Utility Commission of Texas (PUCT).

Program participation is limited to eligible commercial customers who register as a service provider and have demands greater than 50 kW. Other energy efficiency service providers can participate if they aggregate commercial customers for the purposes of demand reduction. If the participating customers reduce their summer on-peak energy demand at specific times, the service provider will be rewarded with a monetary incentive from Oncor. If the service provider is aggregating commercial loads, they may then pass on the incentive to their customers.

The City will develop an educational program that explains what demand response is, outlines its financial and environmental benefits, and presents ways to participate in the CLM program.

The City will create a list of large commercial properties or property types with high energy intensities it can target for this educational program. The program can also connect commercial properties to service providers who will be participating in the CLM program. This can be achieved through the proposed Energy Resource Center as outlined in Action B3.

GOAL 3: DALLAS' COMMUNITIES HAVE ACCESS TO SUSTAINABLE, AFFORDABLE, TRANSPORTATION OPTIONS.

Why Transportation Matters p. 85

Building on City Achievements p. 87

What can I do? p. 88

Actions p. 89

TARGETS

INSTALL 1,500 EV CHARGING OUTLETS TO SUPPORT 39,000 VEHICLES THROUGHOUT THE CITY BY 2030

ALL NEW TRANSIT BUSES AND LIGHT DUTY VEHICLES PURCHASED BY THE CITY, DALLAS SCHOOLS, AND DART AFTER 2030 TO BE FULLY ELECTRIFIED, AND THEN FULL FLEET TRANSITION BY 2040.

SINGLE OCCUPANT VEHICLE TRAVEL MODE SHIFT FROM 88% TO 79% IN 2030 AND 88% TO 62% IN 2050.

WHY TRANSPORTATION MATTERS

The transportation sector, which includes private and public vehicles, trains, and planes, contributes 34% of GHG emissions for the City of Dallas, of which 98% is attributed to on-road transportation. The cost of congestion at the regional level (based on productive hours lost to travel delay) reached an estimated $12.1 billion in 2018.[20] The majority (76.8%) of Dallas residents drive to work alone and the remaining 23.2% carpool (11.1%), telework (4.87%), use public transit (3.8%), walk (1.9%) or bicycle (0.3%). Of the workforce in Dallas, almost 2% have "super commutes" in excess of 90 minutes.[21] Despite having the longest light rail system in the nation, unsustainable land development patterns continue to promote the use of private vehicles. Only 18.7% of all residents are within a 10-minute walk of a transit stop, and residents in majority black neighborhoods have significantly less access to jobs using transit than residents in racially diverse neighborhoods (17 times less, based on a 30-minute transit commute).[22]

Dallas County fails to meet federal air quality standards for ground level ozone, which is produced when nitrogen oxides (NOx) and volatile organic compounds (VOCs) combine with sunlight. This is a direct result of internal combustion engines, especially gasoline and diesel burning engines. Air quality will therefore worsen as temperature rises if overall vehicle miles continue to increase.

Infrastructure in the region is aging, and continued population growth adds further demand. **Figures 23 and 24** highlight critical roadway segments and railways in the 100-year floodplain in Dallas County. Extreme weather can cause delays across all modes of transportation and heat can compromise worker and public safety by causing vehicles to overheat and damage tires, roadway joints, and pavements.

Solutions are aimed at shifting the dominant commuting mode away from single-occupancy, gasoline-powered vehicles. These actions have high potential to reduce overall emissions, reduce rush hour congestion, and improve air quality. Improving access to jobs through changes to land use and transit-oriented development reduces the need to commute long distances and enhances quality of life. Using active and public transportation, transportation demand management (TDM), vehicle fuel-switching and vehicle efficiency, and increasing the overall share of electric vehicles are also encouraged.

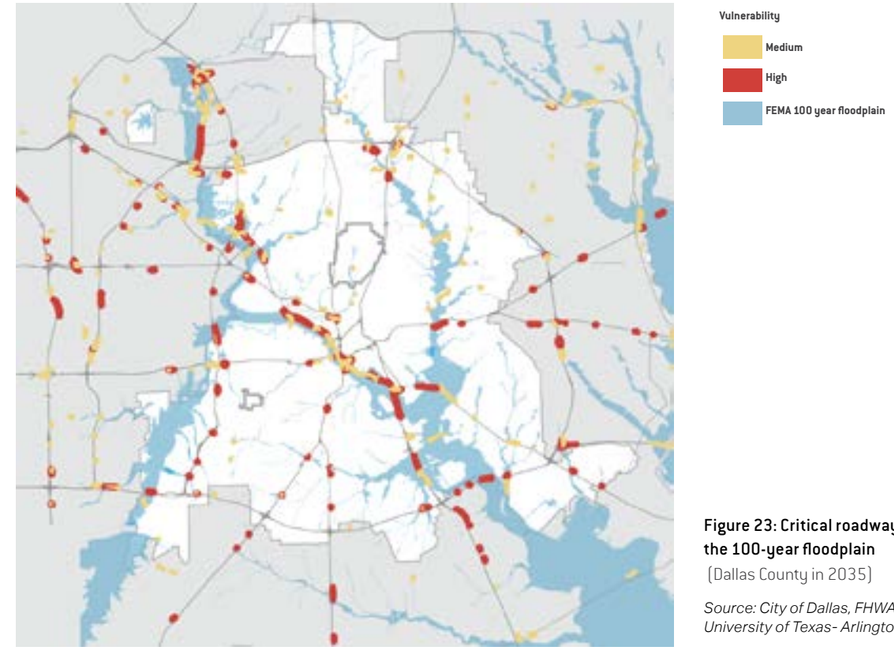


Figure 23: Critical roadway segments in the 100-year floodplain
(Dallas County in 2035)

Source: City of Dallas, FHWA, NCTCOG, & University of Texas- Arlington

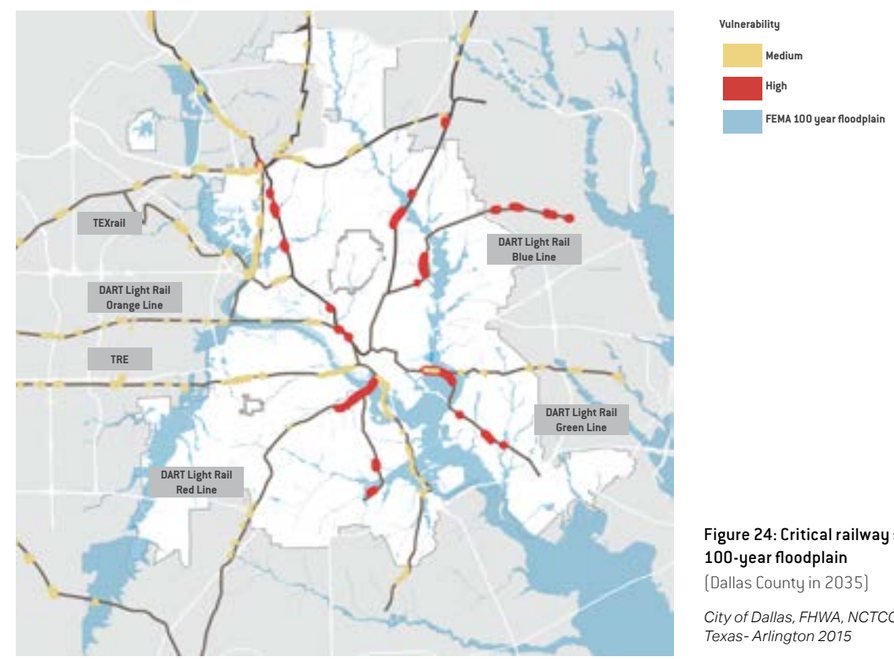


Figure 24: Critical railway segments in the 100-year floodplain
(Dallas County in 2035)

City of Dallas, FHWA, NCTCOG, & University of Texas- Arlington 2015

Credit: Dallas Area Rapid Transit

BUILDING ON CITY ACHIEVEMENTS

The City of Dallas' Clean Fleet Vehicle Policy helps to reduce fleet emissions, reduce overall fuel consumption, save money, and improve air quality for the entire region. The Fleet Maintenance Department manages approximately 5,300 units in its general fleet. Of these, 50% are Alternate Fuel Vehicles (AFVs). Dallas was an early adopter of AFVs and has nearly 2,000 in the general fleet. The City invested in Compressed Natural Gas (CNG) vehicles in the early 1990s, added hybrid-electrics to the fleet in 2001, began using biodiesel in 2007, and invested in full-electric vehicles in 2009.[23]

In order to make DART more affordable, in Spring 2020, DART introduced a low-income pilot program between January 1st, 2020 through December 31st, 2021. The pilot program tests modifications to the existing programs and fares to assess outcomes. Discounted fares can help retain low-income riders and attract additional riders. It can reduce social and economic inequalities by making mobility financially feasible to more residents.[24]

WHAT CAN I DO?

Residents

01 Commute for a whole month on the price of a tank of gas with the **DART Vanpool service**, available to those commuting from an area not served by DART rail or bus. Riders are guaranteed a seat each day and up to two emergency rides home a quarter.

02 Join the **Try Parking It** app to find greener commute options like carpool, vanpool, and transit in north central Texas. Earn rewards from participating businesses for tracking your greener trips.

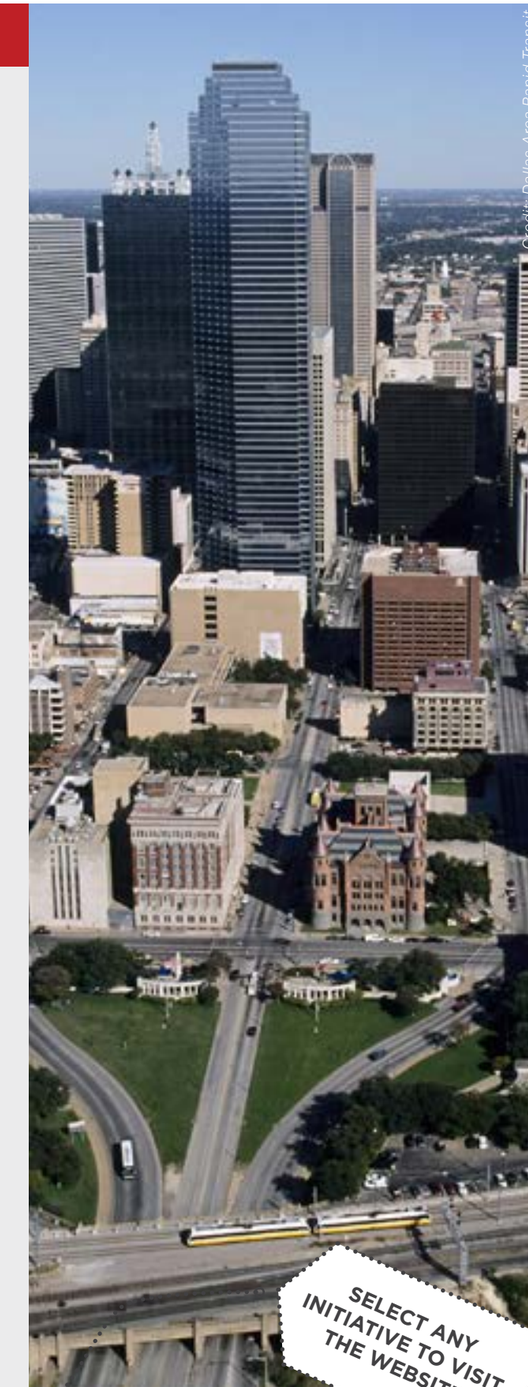
03 Check out **DART's Bike and Ride program**. Bike & Ride commuting combines the cost-effectiveness of public transit with the health benefits of cycling.

Businesses

01 Encourage your employees to use the **DART Vanpool service** by offering pre-tax commuter benefits and/or offering a small subsidy. Vanpool riders get to skip the traffic by riding in the HOV lane and will show up to work less drained from their commutes.

02 Install **workplace charging stations** to support employees who drive electric vehicles. Contact DFW Clean Cities for more information.

03 Consider the **DART Employer Annual Pass program**. Offering an annual DART pass to your employees can boost employee productivity and morale while also offering tangible benefits to your company's bottom line.



Credit: Dallas Area Rapid Transit

SELECT ANY INITIATIVE TO VISIT THE WEBSITE

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03 | Dallas' communities have access to sustainable, affordable TRANSPORTATION options.

Shift the surface transportation system to move people and goods in fuel-efficient vehicles.

Reduce trips where people drive alone.

Synergize land use and housing with transportation infrastructure to increase access to walking and biking options, and public transit.

Ensure that walking, biking, public transit, vehicular transportation infrastructure is reliable and safe under all weather conditions.

- Work with City of Dallas, DISD, and DART to transition the bus and light duty fleet to 100% electric by 2040.
- Work with private and public intrastate transport operators to expand transit services between major super commuting cities.
- Create an incentives/fee program in which shared mobility services can increase their fleet size and operating footprint if their fleets are increasingly electrified.
- Establish a comprehensive incentives package to help accelerate Electric Vehicle use.
- Encourage businesses, commercial entities and institutions to electrify fleet, including, but not limited to local and regional delivery trucks and other heavier vehicles.
- Support and expand recommended Transportation Demand Management strategies identified within the Strategic Mobility Plan.
- Work with DART to expand the GoPass platform application as a comprehensive 'Mobility as a Service' (MaaS) provider to unify and streamline connectivity between public and private multi-modal networks.
- Secure resources to implement the existing bicycle network masterplan.
- Evaluate infrastructure to enable City policy on micromobility services to be distributed equitably.
- Increase bus service across the City by adding new routes, shortening headways, and overall increasing service reliability and customer experience.
- Adopt a target corridor, district, or city-wide mode split goals to help reinforce policies aimed at reducing single-occupancy vehicle use.
- Develop a new comprehensive land use strategy in the upcoming Comprehensive plan update to pair with the Strategic Mobility Plan and CECAP goals, adopt policy to reduce transportation related GHG emissions.
- Expand upon the DART Transit Oriented Development (TOD) guidelines to collaborate on a new proactive TOD and housing strategy with DART.
- Work with DART to roll out a sustainable transport "Mobility Hub" infrastructure program.
- Adopt a revised parking ordinance strategy that supports new mode split goals and land use strategy that minimizes available parking in transit-oriented districts.
- Implement green infrastructure programs that sets specific design and performance standards that treat the Right of way (ROW) as both a mobility and green infrastructure asset.
- Convert all traffic lights and streetlights to LEDs.
- Work with DART to improve bus station shelter amenities that reduce the impact of weather on rider comfort and usability.
- Develop and implement the Climate Change and Extreme Weather Vulnerability and Risk Assessment for Transportation Infrastructure

SHIFT THE SURFACE TRANSPORTATION SYSTEM TO MOVE PEOPLE AND GOODS IN FUEL-EFFICIENT VEHICLES.

T1. WORK WITH CITY OF DALLAS, DISD, AND DART TO TRANSITION THE BUS AND LIGHT DUTY FLEET TO 100% ELECTRIC BY 2040.

ACTION TYPE
Partnership

ACTION SOURCE
New Action

PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Air Quality
Cost Savings

The City and DART will continue shifting the regional bus and light duty vehicle fleets to 100% EV, transitioning the fleet through new procurement policies and retrofitting older infrastructure and assets to accommodate charging stations on route. The City will work with partners to ensure all new transit buses and light duty vehicles purchased after 2030 will be fully electrified, and then full fleet transition by 2040.

EQUITY CONSIDERATIONS

- This action provides the potential for improved air quality and noise reduction in neighborhoods and communities with more dense and frequent transit service.

T2. WORK WITH PRIVATE AND PUBLIC INTRASTATE TRANSPORT OPERATORS TO EXPAND TRANSIT SERVICES BETWEEN MAJOR SUPER COMMUTING CITIES.

ACTION TYPE
Partnership

ACTION SOURCE
New Action

PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Air Quality

The City and DART will work together to incentivize and expand the current offerings in the city for transit commuting services like the existing Vonlane and Greyhound or high-speed rail efforts that shift short-haul air travel or single occupancy commutes onto higher capacity, efficient, hybrid, or electric vehicles. The City and DART will work with the Dallas Regional Chamber of Commerce and the Office of Economic Development to identify businesses that heavily utilize short-haul air travel for super commutes and work with transit commuting services to provide benefits like reduced fare group purchasing, subscription passes, and increased awareness campaigns.

EQUITY CONSIDERATIONS

- Work with transit operators to ensure that super commuting options expand but continue to provide affordable options for interstate travel.

SHIFT THE SURFACE TRANSPORTATION SYSTEM TO MOVE PEOPLE AND GOODS IN FUEL-EFFICIENT VEHICLES.

T3. CREATE AN INCENTIVES/FEE PROGRAM IN WHICH SHARED MOBILITY SERVICES CAN INCREASE THEIR FLEET SIZE AND OPERATING FOOTPRINT IF THEIR FLEETS ARE INCREASINGLY ELECTRIFIED.

ACTION TYPE
Incentive

ACTION SOURCE
New Action

PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Air Quality

Cities around the country have Transportation Network Company (TNC) caps in place, which limit their fleet size. Similarly, Dallas can deploy a TNC cap unless certain conditions are met, such as the electrification of their contractor fleet.
The City will encourage the rapid electrification of ridesharing fleets by working with TNC's to deploy or expand their company vehicle leasing program by offering incentive programs to new contractors to utilize an electric vehicle.

Examples of similar initiatives are occurring in several cities including Austin - where Uber is piloting an EV Champions Initiative to encourage the adoption of more EVs. The initiative provides access to EV education and resources for drivers and in-app features built for EV drivers to locate the nearest charging stations. Over the long term, the City will transition to electrification mandates for ride-share fleets.

T4. ESTABLISH A COMPREHENSIVE INCENTIVES PACKAGE TO HELP ACCELERATE ELECTRIC VEHICLE USE.

ACTION TYPE
Incentive

ACTION SOURCE
New Action

PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Air Quality
Public Health
Cost Savings

The overall strategy to increase EV charging infrastructure is to provide financial support for retrofitting existing developments, while mandating it for new construction. The City will leverage potential grants and other funding sources to help fund EV charging infrastructure for existing developments, with a focus on communities that lack the capital to fund the improvements themselves. Requirements for new development can be adopted as part of the site planning approval process in the zoning ordinance or the building code.

Various incentives could also help extend the federal tax credits for EV purchases as they drop off over time, specifically focusing on low-income populations.

EQUITY CONSIDERATIONS

- A comprehensive EV package would need to address retrofitting low-income neighborhoods to prevent inequities related to early technology options. Incentives could be provided to those who would not ordinarily be able to pay for the retrofit/upgrade/installation.

SHIFT THE SURFACE TRANSPORTATION SYSTEM TO MOVE PEOPLE AND GOODS IN FUEL-EFFICIENT VEHICLES.

T5. SUPPORT AND EXPAND RECOMMENDED TRANSPORTATION DEMAND MANAGEMENT STRATEGIES IDENTIFIED WITHIN THE STRATEGIC MOBILITY PLAN.

ACTION TYPE
Educational

ACTION SOURCE
New Action

PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Air Quality, Public Health, Cost Savings

The City will work with major employers and businesses in the region to comprehensively educate them about the benefits of TDM strategies such as work from home programs, alternative shifts and commutes, and shorter work weeks, and others identified in the Strategic Mobility Plan.

The City can work with the Dallas Regional Chamber of Commerce to identify businesses with large commuting workforces and provide marketing materials that educate the company leadership on the various strategies available, benefits for their employees. and best practices in implementation.

EQUITY CONSIDERATIONS

- Often TDM strategies focus on people that work in white-collar jobs who have the flexibility to work from home or work alternate shifts. Other strategies such as subsidized transit passes lower the cost of commuting while taking single occupancy vehicles off the road. Strategies should be tailored to a wide range of employers and industries to support low wage, shift-based jobs.

Credit: San mliu92 (CC BY-SA 2.0)

REDUCE TRIPS WHERE PEOPLE DRIVE ALONE.

T6. WORK WITH DART TO EXPAND THE GOPASS PLATFORM APPLICATION AS A COMPREHENSIVE 'MOBILITY AS A SERVICE' (MAAS) PROVIDER TO UNIFY AND STREAMLINE CONNECTIVITY BETWEEN PUBLIC AND PRIVATE MULTI-MODAL NETWORKS.

ACTION TYPE
Partnership

ACTION SOURCE
New Action

PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Air Quality, Employment

To maximize the efficiency and capacity of the network and to better facilitate multi-modal transport and connectivity, the City will work with DART and other the regional governments and partner cities to expand the DART GoPass Mobility as a Service (MaaS) platform/application. Improvements should facilitate utilizing multiple modes including DART bus and rail services, agencies, and technologies while offering a single payment or subscription service through a phone. This MaaS subscription service could be discounted for families below a certain AMI. Examples of similar service include WHIM in Helsinki, and the expanded subscription offerings of Uber and Lyft in San Francisco and New York.

EQUITY CONSIDERATIONS

- MaaS systems are typically operated using a smartphone that has an associated digital payment system. In order for this technology to be accessible to a broader population, the City should explore complementary analogue alternatives.
- The MaaS subscription service could be discounted for families below a certain AMI.

T7. SECURE RESOURCES TO IMPLEMENT THE EXISTING BICYCLE NETWORK MASTERPLAN.

ACTION TYPE
Personnel

ACTION SOURCE
Existing Action

PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Air Quality, Employment, Public Health

The existing bicycle masterplan (Dallas Bike Plan (2011) has not been fully implemented due to a lack of resources and no dedicated manager. Hiring an in-house bicycle advocate and coordinator to update the bicycle masterplan and working through the existing implementation hurdles is key to rolling out the approved plan. New leadership should focus on network implementation in areas of highest priority, such as major live/work corridors and neighborhoods that lack bicycle infrastructure and struggle with existing connectivity. The plan should also be updated to accommodate additional micro-mobility technologies (i.e. scooters) in addition to cycling.

EQUITY CONSIDERATIONS

- A criterion for early implementation will be neighborhoods that lack infrastructure and connectivity, which are often low-income communities of color.

REDUCE TRIPS WHERE PEOPLE DRIVE ALONE.

T8. EVALUATE INFRASTRUCTURE TO ENABLE CITY POLICY ON MICRO MOBILITY SERVICES TO BE DISTRIBUTED EQUITABLY.

ACTION TYPE
Program
ACTION SOURCE
Ongoing Action

PRIMARY BENEFIT
Environmental Justice

CO-BENEFITS
Employment, Public Health, Inequality

Micro-mobility services heavily skew towards more affluent neighborhoods despite public policy dictating otherwise. Infrastructure including sidewalks that support the safe deployment of micro-mobility services are lacking or substandard in lower income neighborhoods. The City will evaluate infrastructure to enable micro-mobility services to be deployed alongside general ROW improvements (such as sidewalk and streetlight improvements) to ensure equitable and safe outcomes.

EQUITY CONSIDERATIONS

- Under-served neighborhoods will be consulted about how best to provide appropriate access to micro-mobility schemes.

T9. INCREASE BUS SERVICE ACROSS THE CITY BY ADDING NEW ROUTES, SHORTENING HEADWAYS, AND OVERALL INCREASING SERVICE RELIABILITY AND CUSTOMER EXPERIENCE.

ACTION TYPE
Program
ACTION SOURCE
Ongoing Action

PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Air Quality, Employment, Inequality

The City will work with DART to prioritize investment in the bus system. The investments will include expanding service area coverage with additional bus routes, but also decreasing the headways, increasing frequencies, and increasing reliability and on-time performance. DART will also update their app to improve live-tracking of their bus fleet so that riders have accurate, real-time schedule information for the next bus arrival. These investments into the bus service will be focused the most vulnerable and transit dependent neighborhoods. Special emphasis should be placed on improving the transit system's ability to connect people to major employment centers, such as the inland port and medical district.

EQUITY CONSIDERATIONS

- Service improvements should be focused on transit dependent neighborhoods, thereby reducing reliance on automobiles, and reducing household costs for transportation.

REDUCE TRIPS WHERE PEOPLE DRIVE ALONE.

T10. ADOPT A TARGET CORRIDOR, DISTRICT, OR CITY-WIDE MODE SPLIT GOALS TO HELP REINFORCE POLICIES AIMED AT REDUCING SINGLE-OCCUPANCY VEHICLE USE.

ACTION TYPE
Mandate
ACTION SOURCE
New Action

PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Air Quality, Employment, Public Health, Cost Savings

The City will develop scenarios and goals to be incorporated into the Strategic Mobility Plan (SMP) that specify aggressive mode split goals tied to land use and transit improvement recommendations along a corridor or travel shed. The City will evaluate these scenarios in the SMP and apply coordinated land use, urban design, and transportation investments along corridors that match the intended long-term modal priority.

These targets could take the form of corridor specific goals, district or nodal goals, or city-wide goals.

Mode split goals should help meet and exceed the proposed targets of:

- 10%-15% by 2030 and 30-35% by 2050 of new housing in TOD locations.
- SOV travel mode shift from 88% to 79% in and from 88% to 62% in 2050 (switches to bus and light rail).

The coordinated land use, urban design, and transportation investments that match the mode split targets should reflect policies such as:

- Revised parking standards/maximum parking standards for corridors or neighborhoods that have high transit connectivity
- Increased sidewalk connectivity, wider sidewalk connectivity
- On-street, elevated, separated bicycle lanes
- Land use patterns that reflect more dense, walkable, transit connected neighborhoods

EQUITY CONSIDERATIONS

- Vulnerable communities will benefit indirectly from this action, for example if mode shifts took place within vulnerable communities (improving air quality).
- Creating a mode split goal can help encourage a shift in fiscal and design policy between the City and DART to de-emphasize auto-oriented travel, thereby helping diversify multi-modal options, reduce dependency on car ownership, and drive down the cost of transportation.

SYNERGIZE LAND USE AND HOUSING WITH TRANSPORTATION INFRASTRUCTURE TO INCREASE ACCESS TO WALKING AND BIKING OPTIONS, AND PUBLIC TRANSIT.

T11. DEVELOP A NEW COMPREHENSIVE LAND USE STRATEGY IN THE UPCOMING COMPREHENSIVE PLAN UPDATE TO PAIR WITH THE SMP + CECAP GOALS, ADOPT POLICY TO REDUCE TRANSPORTATION RELATED GHG EMISSIONS.

ACTION TYPE
Plan
ACTION SOURCE
New Action

PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Air quality, Employment, Public Health, Cost Savings

The City will develop a public facing land use strategy in a holistic and comprehensive manner that aligns mixed-income housing and jobs around transit and is coordinated with DART's long-range transit plan and the TOD plan in Action T12. While the TOD plan is specifically related to development directly adjacent to existing and future DART stations, the land use strategy will exist within the Comprehensive Plan and should address the City's broader land use strategy and its relationship with the bus system, regional job growth, and density. The strategy should support better job-housing balance throughout the city and shorter trips and alternative modes even in areas that do not have great transit access. It should also address other mobility related issues such as access to schools, daycare, healthcare and groceries etc. The land use strategy has direct linkages to other relevant plans, such as the 'Transportation Strategic Mobility Plan (ongoing)' , 'Strategic Economic Development Plan (2019)' and 'Comprehensive Housing Policy (2018)'.

As site plans and development cases come through the development review process, conformity with the land use strategy will be required for staff approval before Planning and Zoning Commission. Non-conformity approval must demonstrate how the City or developer intends to mitigate any negative impacts of the project.

EQUITY CONSIDERATIONS

- This action will serve as the primary policy mechanism that manages growth in an equitable manner for transit dependent populations and encourage increased density and a variety of more affordable, mixed-income housing stock.

SYNERGIZE LAND USE AND HOUSING WITH TRANSPORTATION INFRASTRUCTURE TO INCREASE ACCESS TO WALKING AND BIKING OPTIONS, AND PUBLIC TRANSIT.

T12. EXPAND UPON THE DART TRANSIT ORIENTED DEVELOPMENT (TOD) GUIDELINES TO COLLABORATE ON A NEW PROACTIVE TOD AND HOUSING STRATEGY WITH DART.

ACTION TYPE
Partnership
ACTION SOURCE
New Action

PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Air quality, Employment, Inequality, Public Health, Cost Savings

The City will work with DART to expand upon their existing standards and policies to create a comprehensive housing and TOD strategy with a goal to increase transit ridership and reduce car ownership by increasing affordable and mixed income housing stock and low-wage job opportunities near rail stations and Bus Rapid Transit/ Express bus routes. The City will facilitate the development of comprehensive TOD area plans, target financial incentives for TOD and will proactively facilitate development on catalytic TOD sites (including DART parking lots and other city or publicly owned land).

Moreover, this strategy will align with mode split goals (Action T10), transit connectivity strategies, last mile infrastructure and economic development strategies for job growth.

EQUITY CONSIDERATIONS

- Emphasis on incremental development and a slow transition to higher densities will help reduce the negative impacts of redevelopment while also ensuring that new TOD's are strongly linked to centers of employment not only for higher paying white-collar jobs but lower wage-shift jobs and everyone in-between.

Credit: Dallas Area Rapid Transit

SYNERGIZE LAND USE AND HOUSING WITH TRANSPORTATION INFRASTRUCTURE TO INCREASE ACCESS TO WALKING AND BIKING OPTIONS, AND PUBLIC TRANSIT.

T13. WORK WITH DART TO ROLL OUT A SUSTAINABLE TRANSPORT "MOBILITY HUB" INFRASTRUCTURE PROGRAM.

ACTION TYPE
Program
ACTION SOURCE
New Action

PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Air Quality, Employment, Inequality, Public Health

The City will work with DART to fund and construct a series of mobility hubs throughout the city that provide sustainable transportation options such as electrified TNCs, EV charging using solar generation, public transport, micro-transit and micro-mobility. The City will partner with private companies such as TNC's, e-scooter companies, and carshare services to fund and provide services at these hubs.

Southern Dallas neighborhoods will be considered for the initial hubs, so that underserved residents will be able to access a variety of sustainable transport options that connect them to major places of employment. The hubs will be implemented alongside general right-of-way improvements (such as sidewalk and streetlight improvements) to ensure equitable and safe outcomes.

Once deployed, the hubs will be integrated within the Mobility as a Service' (MaaS) platform that streamlines connectivity between multi-modal networks, including DART bus and rail service (Action T6).

Credit: Dallas Area Rapid Transit

EQUITY CONSIDERATIONS

- Neighborhoods that are currently poorly served by public transit options will be identified for the first mobility hubs.

SYNERGIZE LAND USE AND HOUSING WITH TRANSPORTATION INFRASTRUCTURE TO INCREASE ACCESS TO WALKING AND BIKING OPTIONS, AND PUBLIC TRANSIT.

T14. ADOPT A REVISED PARKING ORDINANCE STRATEGY THAT SUPPORTS NEW MODE SPLIT GOALS AND LAND USE STRATEGY THAT MINIMIZES AVAILABLE PARKING IN TRANSIT-ORIENTED DISTRICTS.

ACTION TYPE
Mandate
ACTION SOURCE
New Action

PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Air Quality, Cost Savings

As part of a comprehensive effort to revisit land use and urban design standards based on the Strategic Mobility Plan and through the Comprehensive Plan Update, parking maximums will be introduced in areas with mature transit infrastructure to "level the playing field" between SOV and transit convenience. Where appropriate, parking management districts will be introduced (rather than parking standards) per development to begin shifting to a shared parking model for major nodes of activity. Parking management districts are often deployed by a local entity, such as a Public Improvement District (PID), to regulate supply and demand for parking through a combination of strategies aimed at reducing the number of parking spots for each parcel. Strategies can include shared parking, dynamic pricing, establishing maximum parking ratios, allowing off-site parking, or modifications to parking minimums. The parking management district will help balance the needs of developers who want to minimize expensive parking spots for walkability reasons and those who require more parking in short bursts for their businesses.

A parking district standard can be piloted in one of Dallas' Public Improvement Districts such as Deep Ellum PID or Downtown Improvement District.

Parking management districts should also adopt design guidance to retrofit surface lots with green infrastructure best practices, such as permeable surfaces or bioswales for water conveyance.

Credit: Dallas Area Rapid Transit

ENSURE THAT WALKING, BIKING, PUBLIC TRANSIT, VEHICULAR TRANSPORTATION INFRASTRUCTURE IS RELIABLE AND SAFE UNDER ALL WEATHER CONDITIONS.

T15. IMPLEMENT GREEN INFRASTRUCTURE PROGRAMS THAT SPECIFY DESIGN AND PERFORMANCE STANDARDS THAT TREAT THE RIGHT-OF WAY AS BOTH A MOBILITY AND GREEN INFRASTRUCTURE ASSET.

ACTION TYPE
Program
ACTION SOURCE
New Action

PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Air Quality, Public Health, Water quality, Adaptation

The City will leverage the success of 'the Loop' to build a city-wide network of urban trails that link neighborhoods with transportation hubs and economic centers. This network would be built upon trails, green space, and green infrastructure that also serve as critical mobility assets that connect neighborhoods to places of employment without the need for single occupancy vehicles. The network also doubles as a mechanism to address water quality and storage, heat island mitigation, and lack of open space and parks.
The 'Drainage Design Manual (2019)' and the 'Complete Streets Design Manual (2013)' provide design guidelines. The City will implement ROW upgrades through the long-term Capital Improvement Plan incorporating these guidelines.

EQUITY CONSIDERATIONS

- The green infrastructure and mobility network will be prioritized in neighborhoods that are in most need of mobility improvements and additional parks and trails, which tend to be lower income neighborhoods.

T16. CONVERT ALL TRAFFIC LIGHTS AND STREETLIGHTS TO LEDS.

ACTION TYPE
Program
ACTION SOURCE
Ongoing Action

PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Cost Savings

The City will implement a comprehensive traffic and streetlight retrofit program and explore traffic signal system technologies to reduce energy use, operating costs and reduce lighting outages during weather events. LED lights require significantly less energy and have longer lifespans than high-pressure sodium bulbs or other options commonly used in streetlights. The City can contract with an ESCO to perform lighting energy audits and identify the best available retrofit improvements. In most cases, the ESCO pays up-front costs associated with retrofit installation, further reducing financial. The City will also update its streetlight standards to require energy-efficient streetlights for new and replacement installations.

ENSURE THAT WALKING, BIKING, PUBLIC TRANSIT, VEHICULAR TRANSPORTATION INFRASTRUCTURE IS RELIABLE AND SAFE UNDER ALL WEATHER CONDITIONS.

T17. WORK WITH DART TO IMPROVE BUS STATION SHELTER AMENITIES THAT REDUCE THE IMPACT OF WEATHER ON RIDER COMFORT AND USABILITY.

ACTION TYPE
Program
ACTION SOURCE
Ongoing Action

PRIMARY BENEFIT
Adaptation

CO-BENEFITS
Public Health

The City will work with DART to fund, construct, and improve existing and new bus shelters. The City will help fund improvements in the right-of-way while DART funds improvements to the physical shelters themselves. The improvements can include amenities such as trees for shade, water fountains, larger shelters and covered areas, and other items that also double as co-benefits in reducing the impacts of climate on ridership comfort.

EQUITY CONSIDERATIONS

- Improvements to shelters should be focused on vulnerable and transit dependent populations first, before being rolled out to the wider city.

T18. DEVELOP AND IMPLEMENT THE CLIMATE CHANGE AND EXTREME WEATHER VULNERABILITY AND RISK ASSESSMENT FOR TRANSPORTATION INFRASTRUCTURE

ACTION TYPE
Program; Plan; Assessment
ACTION SOURCE
New Action

PRIMARY BENEFIT
Adaptation

CO-BENEFITS
Public Health

The 'Climate Change/Extreme Weather Vulnerability and Risk Assessment for Transportation Infrastructure in Dallas and Tarrant Counties' (2015) study, identified segments of regional highways and rail routes that are vulnerable to climate change, specifically focusing on issues related to flooding and extreme heat. The City, TxDOT and DART will move towards developing projects that address those vulnerabilities identified in the study, incorporating them into local and regional capital improvement plans for funding and implementation.

SHIFT THE SURFACE TRANSPORTATION SYSTEM TO MOVE PEOPLE AND GOODS IN FUEL-EFFICIENT VEHICLES.

T19. ENCOURAGE BUSINESSES, COMMERCIAL ENTITIES AND INSTITUTIONS TO ELECTRIFY FLEET, INCLUDING, BUT NOT LIMITED TO LOCAL AND REGIONAL DELIVERY TRUCKS AND OTHER HEAVIER VEHICLES.

ACTION TYPE
Incentive

ACTION SOURCE
New Action

PRIMARY BENEFIT

Mitigation

CO-BENEFITS

Air Quality

Public Health

Cost Savings

The City will aim to help local businesses electrify delivery trucks and other heavier vehicles to 100% EV through education, outreach, and partnerships.

The City will partner with the Dallas Regional Chamber of Commerce and others in order to encourage local businesses to electrify their fleets. Through this partnership, the City and Regional Chamber could provide resources and educational materials to businesses on fleet electrification. The partnership could identify businesses with large fleets or frequent travel who would experience a higher financial benefit from electrification. The City and Regional Chamber could host joint events and provide educational opportunities that would highlight the benefits of fleet electrification while connecting businesses to the proper rebates and incentives.

GOAL 4: DALLAS IS A ZERO WASTE COMMUNITY.

Why Waste Matters p. 107

Building on City Achievements p. 109

What can I do? p. 110

Actions p. 111

TARGETS

DIVERT 35% AND 80% OF ORGANIC WASTE BY 2030 AND 2050, RESPECTIVELY.

DIVERT 60% AND 90% OF PAPER WASTE BY 2030 AND 2050, RESPECTIVELY.

35% AND 45% REDUCTION IN WASTE DIVERTED FROM LANDFILLS IN 2030 AND 2040, RESPECTIVELY.

WHY WASTE MATTERS

Climate change will impact both the operations and infrastructure assets in the waste sector. Increased temperatures can impact the health and safety of waste collection workers. Extreme weather events may lead to the unexpected need to deal with the collection and disposal of large amounts of debris. Municipal solid waste represents a small percentage (less than 1%) of GHG emissions in Dallas. However, from a broader environmental sustainability perspective, waste-based emissions are an important area for local action. Reducing the amount of waste sent to landfills can provide a variety of environmental benefits, including GHG emissions reductions. The City is responsible for collecting waste, recyclables, brush and bulky waste from all single family households (approximately 240,000 tonnes) of which 23% is recycled. **Figure 26** provides a breakdown of this waste stream by material type; these data illustrate a good potential for recycling, dependent on market conditions.

Approximately two-thirds of the waste generated in Dallas is from the commercial, institutional, and industrial sectors. **Figure 25** provides an estimated breakdown of generated waste by source. Currently the City's landfill has approximately 30 years remaining capacity. In less than 3 years, the DFW landfill located in Lewisville is scheduled to close. This facility accepts over 1 million tons of waste per year (10% of the total waste disposed in the NCTCOG region). It is possible that a significant percentage of this material will be disposed at the McCommas Bluff Landfill following closure of DFW.

City policies and programs regarding the acceptance of more waste at the landfill will impact site life, revenue generation, and future GHG emissions. The City currently has an aggressive landfill gas-to-energy program, where methane is captured and used for energy recovery. The landfill gas-to-energy program means that many materials that would be considered compostable are being accepted by the landfill to support gas generation. Landfills and transfer stations are often located near low-income communities, which can result in health and safety risks such as poor air quality, noise pollution, and traffic (**Figure 27**).

Solutions in this sector draw on the principles of the 5Rs of Zero Waste: refuse, reduce, reuse (including repair!), recycle, and rot. Refusing and reducing mean saying no to disposables, avoiding single use plastics and packaging, and saying no to participating in unsustainable practices. Reusing and repairing mean using goods more than once, buying secondhand, reupholstering your sofa. Materials should only be recycled or composted (rotted) as the final steps in the hierarchy. Additionally, actions in this sector identify opportunities for GHG emission reductions through waste collection operations and continuing to capture landfill-generated gas.

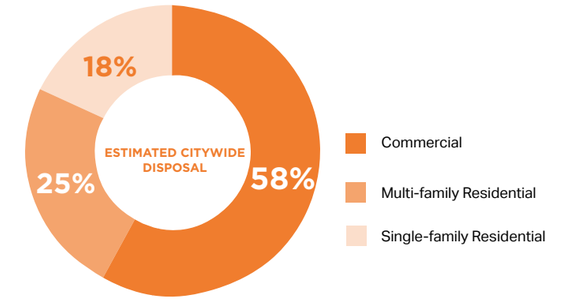


Figure 25: Estimated citywide disposal
Source: City of Dallas Waste Inventory 2013

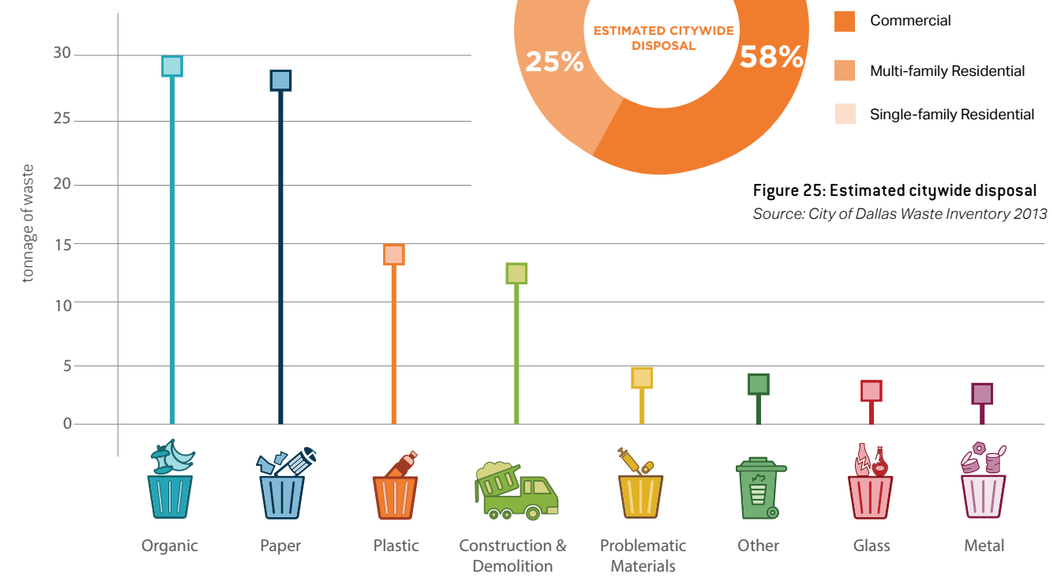


Figure 26: Types of waste in Dallas' landfills
Source: City of Dallas Waste Inventory 2013

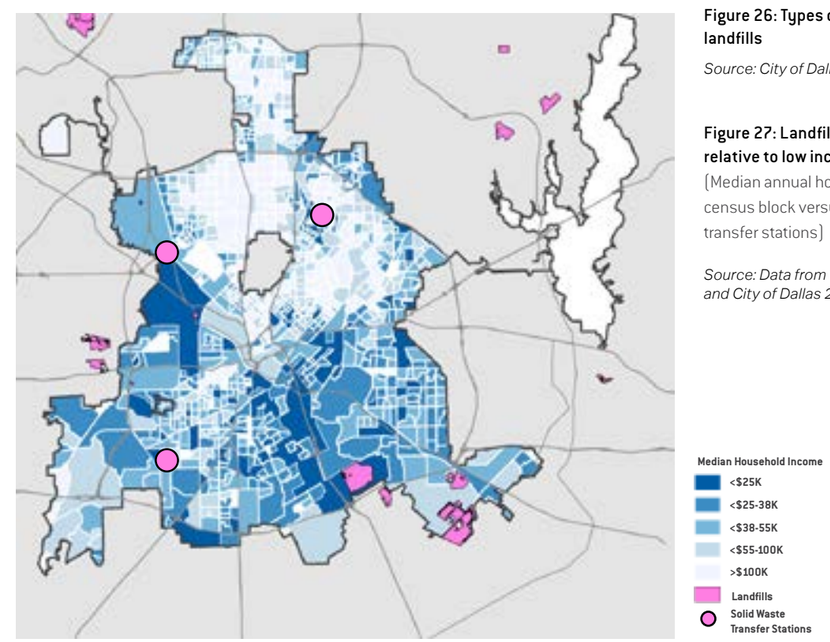


Figure 27: Landfills and transfer stations relative to low income areas.
(Median annual household income by census block versus landfills and solid waste transfer stations)

Source: Data from U.S. Census Bureau 2018 and City of Dallas 2019

BUILDING ON CITY ACHIEVEMENTS

Adopted by Council in February 2013, the Long-Range Solid Waste Master Plan, also known as the Zero Waste Management Plan is the beginning of a long-range systematic effort, with incremental goals to strive for sustainability, reduce waste volumes, maximize diversion through reuse and recycling efforts, and demonstrate that economic growth, environmental stewardship, and fiscal responsibility are not mutually exclusive. The plan sets increasing diversion goals/percentages of 60% diversion by 2030, and maximum diversion by 2040. Proposed initiatives include voluntary programs (short-range), accessibility mandates, disposal bans and a review of advanced waste technologies.

Programs target residential, multi-family and commercial sectors. [25] The City is currently updating this plan to reflect changes to the market and other local waste management considerations. The Multi-family Recycling Ordinance was unanimously approved by the Dallas City Council on June 13, 2018. Starting on January 1, 2020, apartment complexes with eight or more units must provide residents with recycling containers within visible distance of garbage containers. Since approximately 50-55% of the population in Dallas lives in multi-family units, ensuring that these residents have access to recycling is an important part of the City's overall waste diversion goals and the Zero Waste Management Plan.[26]

WHAT CAN I DO?

Residents

01 Check out the **Dallas Resident's Guide to Recycling** to make sure you are recycling properly. Did you know not to bag your recyclables, or that just a quick rinse is enough to wash your recyclable containers?

02 Find out where you can recycle e-waste, such as computers, TVs, printers, microwaves, and other appliances at the **Dallas Electronic Recycling program**.

03 Enter your zip code into the Find a Recycle Center tool to find a location to **recycle your plastic bags**. First, re-use them as much as possible.

Businesses

01 Become **Green Business Certified** to promote your eco-friendly business practices and receive recognition for your efforts to reduce waste and increase recycling.

02 Volunteer for the **Adopt-a-Park Program** that promotes partnerships between community members, groups, and businesses to assist the Parks staff with routine maintenance, clean up, and beautification of parks, open spaces, and trails, creating a beautiful, clean environment for all to enjoy.

SELECT ANY INITIATIVE TO VISIT THE WEBSITE

COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN

SELECT ANY ACTION TO SKIP DIRECTLY TO THAT PAGE

04 Dallas is a zero WASTE community.

Create opportunities to go beyond recycling and choose to refuse, reduce, reuse and repair.

- Actively promote source reduction, recycling and composting to the Dallas community.
- Develop a comprehensive green procurement plan for City operations and establish a sustainable procurement policy.

Operate a clean, green and efficient waste system.

- Improve solid waste, recycling, and brush/bulky waste collection efficiency.
- Explore potential for electric waste collection trucks.
- Update and implement the Zero Waste Management Plan.
- Expand efforts to reduce illegal dumping by implementing recommendations identified in the 'Litter and Illegal Dumping Assessment Study (2018)'.
- Encourage the development of material markets – focusing on creating new economic opportunities.

Generate energy from organics.

- Continue to capture gas and expand capacity from landfill for reuse and evaluate for City operations.
- Adopt an ordinance to implement a city-wide organics management program.

CREATE OPPORTUNITIES TO GO BEYOND RECYCLING AND CHOOSE TO REFUSE, REDUCE, REUSE AND REPAIR

SW1. ACTIVELY PROMOTE SOURCE REDUCTION, RECYCLING AND COMPOSTING TO THE DALLAS COMMUNITY.

PRIMARY BENEFIT

Environmental Quality

CO-BENEFITS

Resource Consumption, Emissions Reduction, Employment

ACTION TYPE
Educational; Incentive

ACTION SOURCE
New Action
Ongoing Action

The Dallas community, including residents and businesses generate approximately 2.8 million tons of municipal solid waste annually.[27] To achieve the goals of the City's Long Range Solid Waste Management Plan (Zero Waste Plan) and reduce the GHG associated with landfilling waste, the City will increase current education efforts to inform residents and business owners of their options to refuse, reduce, reuse and recycle. The public information program should prioritize waste reduction in the commercial sector and identify opportunities to reduce single use products.

EQUITY CONSIDERATIONS

- Ensure that recycling education campaigns are tailored to meet the needs and culture of each community.
- The action may provide potential employment opportunities at new businesses. Given that a majority of recycled and waste businesses are in the southern sector of the city, City efforts to promote market development should be focused here.

CREATE OPPORTUNITIES TO GO BEYOND RECYCLING AND CHOOSE TO REFUSE, REDUCE, REUSE AND REPAIR

SW2. DEVELOP A COMPREHENSIVE GREEN PROCUREMENT PLAN FOR CITY OPERATIONS AND ESTABLISH A SUSTAINABLE PROCUREMENT POLICY.

PRIMARY BENEFIT

Environmental Quality

CO-BENEFITS

Resource Consumption, Resource Conservation, Emission Reduction, Employment, Cost savings

ACTION TYPE
Mandate

ACTION SOURCE
New Action

Sustainable procurement practices can leverage the City of Dallas' purchasing power and ability to acquire more sustainable products and services, while contributing to the City's social responsibility and increasing natural resource conservation. This plan and policy will also provide a framework for the other actions in the plan which are demonstrating the City's leadership around environmental and climate action. A training program will be rolled out by Procurement Services to ensure that all City staff responsible for purchasing goods and services on behalf of the City understand the new requirements.

The plan would include criteria for products or service selection, performance metrics, best practices and suppliers and incorporate the following principles:

- High recycled content of products
- Preference for biodegradable items
- Requirements for low toxicity content in products (e.g. low VOC paints, cleaning products etc.)
- Consideration for life cycle costs
- Locally sourced foods at City sponsored events (see action FA9)
- Preference for renewable fuel types (see actions T1-T4; SW4)
- Energy efficiency and water conservation (see actions B6-B12; WR1-WR6)
- Preference for suppliers that have achieved the City's Green Business Certification or equivalent

OPERATE A CLEAN, GREEN AND EFFICIENT WASTE SYSTEM.

SW3. IMPROVE SOLID WASTE, RECYCLING, AND BRUSH/BULKY WASTE COLLECTION EFFICIENCY.

ACTION TYPE
Assessment
ACTION SOURCE
Ongoing Action

PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Cost Savings
Air Quality

As the city continues to grow and waste generation and recycling patterns change, the City should assess and modify service frequency, number of trips and route optimization on an annual basis. The City will evaluate benchmarks for service frequency and its collection routes to improve efficiency and reduce the number of trips required. As Dallas' transportation system becomes more congested, it may also be necessary to add transfer stations. The use of these facilities will reduce the number of miles driven by collection vehicles by consolidating waste streams into larger transfer vehicles.

EQUITY CONSIDERATIONS

- The location of future new transfer stations should not negatively impact already vulnerable communities.

SW4. EXPLORE POTENTIAL FOR ELECTRIC WASTE COLLECTION TRUCKS.

ACTION TYPE
Assessment
ACTION SOURCE
Ongoing Action

PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Air Quality

The City has an extensive fleet of vehicles that provide waste collection services, and primarily rely on diesel fuel. The City is already in the process of converting some of the fleet to CNG to reduce GHG emissions.[28] The City should evaluate opportunities for replacing the short-range vehicles with electric vehicles over time as part of a fleet replacement program.

OPERATE A CLEAN, GREEN AND EFFICIENT WASTE SYSTEM.

SW5. UPDATE AND IMPLEMENT THE ZERO WASTE MANAGEMENT PLAN.

ACTION TYPE
Mandate; Assessment
ACTION SOURCE
Ongoing Action

PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Resource Consumption
Air Quality

The City is in the process of developing an update to the Long Range Solid Waste Master Plan (Zero Waste Plan). The City defines 'Zero Waste' as no waste going to landfill due to reuse, recycling and composting programs. The plan will identify policies that are designed to reduce the amounts of waste requiring disposal through source reduction, recycling and composting programs to achieve the zero-waste goal by 2040.

Key components of the Zero Waste Management Plan should prioritize the following initiatives. For each, a phased approach will be undertaken, beginning with incentives, moving towards mandates.

Universal Recycling Ordinance for the commercial sector. Adoption of a Universal Recycling Ordinance involves requiring affected property owners to ensure that tenants and employees have access to convenient recycling. The program will be implemented through the City's franchised haulers by requiring that they provide recycling services for reasonable rates. The ordinance does not require business to have a recycling program, however, it will incentivize businesses to recycle due to increased costs of standard collection.

Adopt Green Building Code. This code is related to the management of construction and demolition debris. As part of building construction permits, it would require developers and builders to present a solid waste management plan that incorporates efforts to reduce or recycle building materials. In order to implement this ordinance, it would require a significant public information program focusing on builders to initiate voluntary recycling. The City should support by assisting in developing markets for materials that could be recycled (See action SW3). The City can also initiate a recognition program or provide grants for projects that include significant recovery of materials from either demolition or incorporation of recycled materials in new building construction.

Evaluate advances in technology to convert waste to energy. Most waste generated by the City is disposed of at the McCommas Bluff Landfill. There are technologies being developed that may result in an environmentally acceptable alternative. Most of these technologies are currently at the demonstration scale and are significantly more expensive to manage than the City's landfill. As landfill capacity decreases, and technologies advance, the increased cost of disposal may make technologies such as pyrolysis or gasification more feasible for Dallas. The City will periodically monitor and evaluate waste to energy alternatives.

OPERATE A CLEAN, GREEN AND EFFICIENT WASTE SYSTEM.

SW6. EXPAND EFFORTS TO REDUCE ILLEGAL DUMPING BY IMPLEMENTING RECOMMENDATIONS IDENTIFIED IN THE 'LITTER AND ILLEGAL DUMPING ASSESSMENT STUDY'.

ACTION TYPE
Program; Educational
ACTION SOURCE
Ongoing Action

PRIMARY BENEFIT
Environmental Quality

CO-BENEFITS
Public Health
Water Quality
Stewardship

The City carried out an assessment of efforts to reduce illegal dumping in Dallas and presented its findings in the 'Litter and Illegal Dumping Assessment Study (2018)'. The study identified measures designed to reduce illegal dumping. These include education and outreach programs, enforcement of regulations, and an increase in community engagement in litter collection. The City will implement the recommendations identified through this study.

EQUITY CONSIDERATIONS

- Often, illegal dump sites are in locations in proximity to low-income communities. An aggressive clean-up program would enhance the quality of life for these communities.

SW7. ENCOURAGE THE DEVELOPMENT OF MATERIAL MARKETS – FOCUSING ON CREATING NEW ECONOMIC OPPORTUNITIES.

ACTION TYPE
Incentive
ACTION SOURCE
New Action

PRIMARY BENEFIT
Environmental Quality

CO-BENEFITS
Employment
Resource Consumption
Emissions Reduction

The Circular Economy concept describes a process whereby pollution and waste are designed out, and materials and products are recovered and brought back into the marketplace. To achieve this, markets must be developed to accept recycled materials and manufacture them into useful products. Recent global trends such as China no longer accepting US recyclable materials, have closed several markets for recycling materials so the need (and potential) to develop new ones has increased. The City can encourage the development of new markets as part of an economic development program or through other incentives.

The City of Houston's 'Reuse warehouse' project collects reusable building materials and redistributes them freely to non-profits, educational institutions and government agencies. To date, the program has diverted 4,500 tonnes of materials.[29]

EQUITY CONSIDERATIONS

- The action may provide potential employment opportunities at new businesses. Given that a majority of recycled and waste businesses are in Southern city, City efforts to promote market development should occur in this sector as well.

GENERATE ENERGY FROM ORGANICS.

SW8. CONTINUE TO CAPTURE GAS AND EXPAND CAPACITY FROM LANDFILL FOR REUSE AND EVALUATE FOR CITY OPERATIONS.

ACTION TYPE
Program
ACTION SOURCE
Ongoing Action

PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Cost Savings
Air Quality
Resource Consumption

The City of Dallas has a public-private partnership with a contractor who manages and operates the Landfill Gas System at McCommas Bluff Landfill. As waste decomposes in the landfill, it creates methane gas – which has a greater impact on climate change than other greenhouse gases such as carbon dioxide. The landfill has a landfill gas recovery program that collects the methane gas generated and converts it to a useful fuel. As the landfill develops and accepts more waste, the system will periodically be expanded to increase recovery of methane gases from the landfill. The gas is currently being upgraded to pipeline quality gas. The City's options for this gas include marketing it as a "renewable resource" or using the gas for City fleet needs or other energy needs.

SW9. ADOPT AN ORDINANCE TO IMPLEMENT A CITY-WIDE ORGANICS MANAGEMENT PROGRAM.

ACTION TYPE
Mandate
ACTION SOURCE
New Action

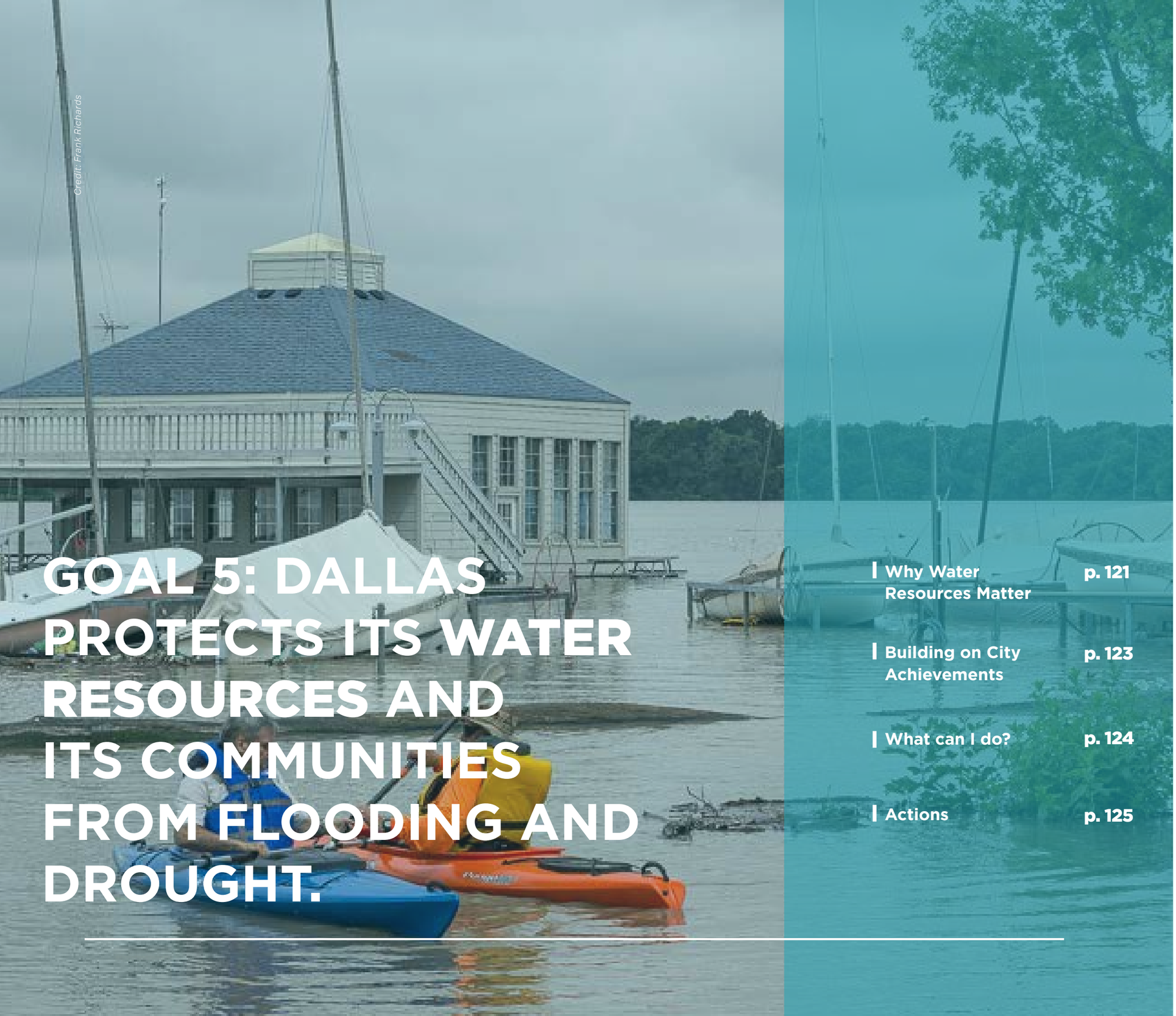
PRIMARY BENEFIT
Mitigation

CO-BENEFITS
Stewardship

Organic materials such as tree waste, brush, yard waste, food waste and biosolids represent a significant percentage of the overall waste stream. The City's landfill is currently permitted for composting and a composting operation for brush, yard waste, biosolids and food waste from large commercial establishments is under consideration. The City will adopt a new commercial waste ordinance (or expand requirements of another ordinance) that prevents food enterprises including restaurants, and supermarkets that prepare, process or serve food from sending organic waste to the landfill. The City will identify potential markets (such as composters) and evaluate the potential for energy generation from food waste and biosolids. The City will evaluate the feasibility of a residential organics management program that includes curbside pickup for yard and food waste.

EQUITY CONSIDERATIONS

- This action may result in air quality and odor issues related to the operation of the compost facility depending on the technology and where it is sited. Ensure this is factored in and mitigated such that it does not negatively affect surrounding communities.



Credit: Frank Richards

GOAL 5: DALLAS PROTECTS ITS WATER RESOURCES AND ITS COMMUNITIES FROM FLOODING AND DROUGHT.

Why Water Resources Matter p. 121

Building on City Achievements p. 123

What can I do? p. 124

Actions p. 125

TARGETS

1% DECREASE IN PER-CAPITA ANNUAL WATER CONSUMPTION.

5%, AND 10% OF WATER FOR INDIRECT REUSE IMPLEMENTATION BY 2030 AND 2050, RESPECTIVELY.

30%, 60% AND 100% REDUCTION IN NUMBER OF IMPAIRED WATERBODIES LISTED IN THE WATERSHED BY 2030, 2040 AND 2050, RESPECTIVELY.

45% AND 100% REDUCTION IN GHG EMISSIONS FROM TREATMENT FACILITIES BY 2035 AND 2050, RESPECTIVELY.

WHY WATER RESOURCES MATTER

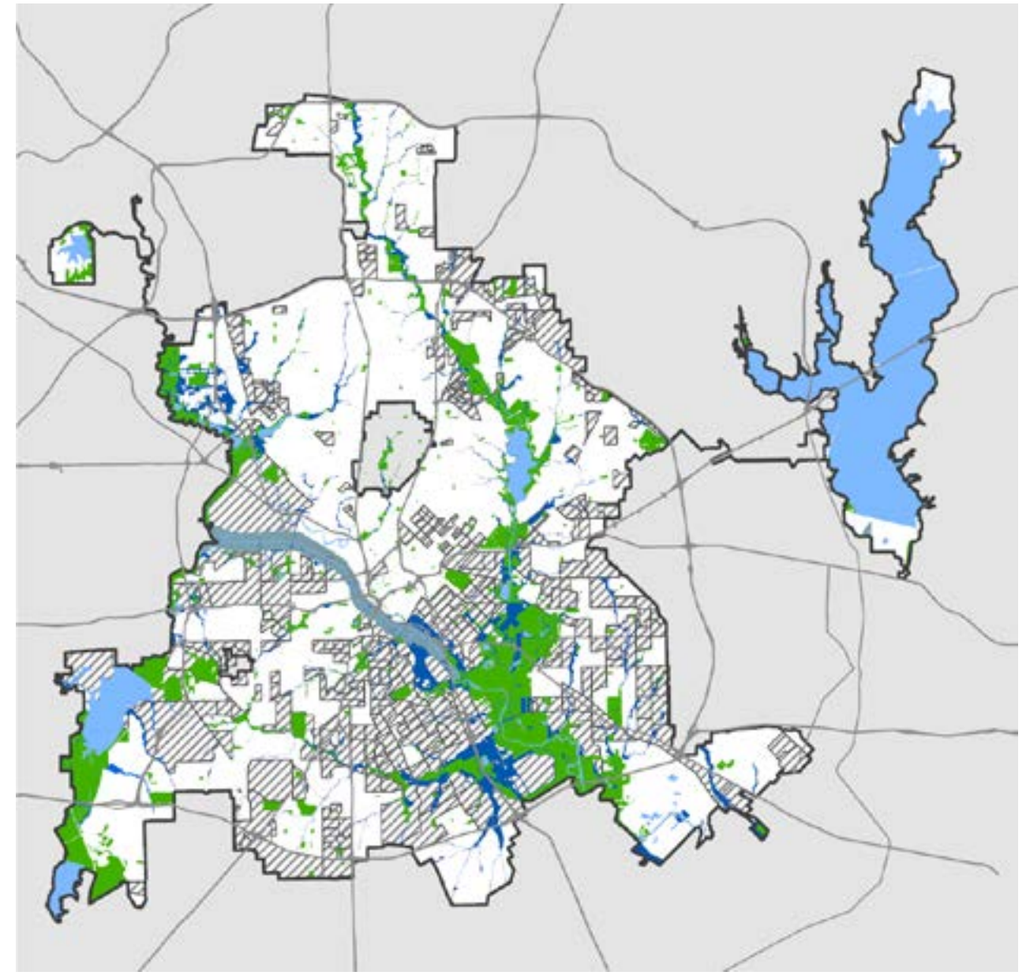
The water and wastewater sectors together contribute to less than 1% of Dallas' GHG emissions; however, access to clean water is foundational to public health and quality of life. The CECAP considers multiple aspects of water resources management: long range planning, water supply, water treatment, water delivery and quality, wastewater collection, wastewater treatment, stormwater management, flood management, water conservation and drought management.

Between 2020 and 2070, Dallas' existing water reserves are expected to decrease due to sedimentation and increased evaporation of reservoirs. This is a result of anticipated temperature increases.[30] Since 2001, the City's broad-based water efficiency measures have saved approximately 316 billion gallons or 62 million gallons per day (MGD) and reduced per capita-daily (GPCD) use by 26%. Annual surveys indicate that customer awareness of the watering ordinance has increased from 60% to 76% and that customers' positive water conservation behaviors are up from 46% to more than 71%. The City removed a total of 38,947 cubic yards of debris and floatables from sumps, storm sewers, levees, trash racks, creeks, and retention/detention basins. A total of 91,872 gallons of debris was removed from stormwater interceptors.[31]

By 2050, periods of low precipitation will be disrupted by single storm events stronger in intensity than what is experienced currently. By 2100, there will be as many as 40% more days with severe thunderstorms per year. There is an associated increased flood risk in low-lying areas adjacent to the floodplain (**Figure 28**).

Droughts could exacerbate extreme heat and the urban heat island effect. The projected proportion of economic expected losses from natural disasters is modeled to be 58% from severe thunderstorms and 38% from flooding. These projections will have a significant impact on the community. The potential impacts include increases in water bills and property damage due to flooding.

For the City to protect water resources and plan for the future, actions have to be taken by private entities, residents and businesses, and the City itself. Continuing collaboration with other water agencies will be essential for long-term water resource planning to prepare for the future and to share costs of major capital improvement projects that bring new water resources to the DFW metro area.



Low Income Census Blocks
100- Year Flood Zone
Open Space
Parks/ Recreation
Water
Flood control

Figure 28: Flood risk relative to low income areas
(FEMA 100-year flood zone overlaid with open space land uses vs low income census blocks)

Source: Data from U.S. Census Bureau 2018 and U.S. Federal Emergency Management Agency 2018.

BUILDING ON CITY ACHIEVEMENTS

In 2006, Dallas Water Utilities (DWU) expanded its school education programs with an online tool and in-classroom program called Environmental Education Initiative (EEI) to provide programs for grades kindergarten through twelve. This is an important resource for teachers with links to videos on outdoor water use, indoor water use, watersheds, the power of conserving, and surface-groundwater interactions. To date, the EEI program has reached more than 140,000 students, 376,000 City of Dallas citizens and trained more than 12,000 teachers, in a total of 272 schools.[32]

WHAT CAN I DO?

Residents

01 **Schedule a free irrigation system evaluation** by a licensed landscape irrigation specialist and potentially save hundreds of dollars per year on your water bill.

02 Use the **Water Conservation Checklist** to quickly identify easy ways to reduce water consumption, from food prep, personal care, and household cleaning to plumbing improvements.

03 **Get free plumbing assistance** or water efficiency upgrades to reduce water bills through the **Minor Plumbing Repair Program**, which is available to low income homeowners who are customers of Dallas Water Utilities.

Businesses

01 **Schedule a free, no obligation water efficiency assessment** for your industrial, commercial, or institutional facility and potentially receive up to $100,000 in rebates towards the cost of new equipment and processes that conserve water at existing facilities.

02 Consider using **reclaimed water** for flushing toilets and landscape irrigation.

SELECT ANY INITIATIVE TO VISIT THE WEBSITE

COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN

SELECT ANY ACTION TO SKIP DIRECTLY TO THAT PAGE

05 | Dallas protests its WATER resources and its communities from flooding and drought.

Conserve and protect our water resources through community stewardship, educational programs and best management practices.

- Continue investment in public awareness campaigns to increase knowledge of the value of water and importance of conservation.
- Continue investment in leak detection and expand programs to reduce overall water loss through the conveyance systems.
- Evaluate potential opportunities and financial feasibility for reusing water for non-drinking purposes.
- Encourage businesses and residents to plant drought-tolerant and native vegetation or xeriscape to reduce irrigation water use.
- Continue to monitor and protect water quality and implement improvement projects in the watershed.
- Continue to protect and monitor water quality by tracking emerging contaminants that may impact public health.
- Expand efforts to reduce illegal dumping by implementing recommendations identified in the 'Litter and Illegal Dumping Assessment Study (2018)'.

Protect neighborhoods from flooding and prepare them for droughts.

- Use FEMA Community Rating System to educate and protect communities from flooding.
- Complete the implementation of major planned and ongoing drainage infrastructure projects to improve community resilience to flooding.
- Initiate a comprehensive storm drainage system assessment and planning process.
- Evaluate policies affecting drainage and erosion to ensure sustainable development and mitigate adverse impacts.
- Continue monitoring, evaluating and updating the Drought Contingency Plan.

Be a regional leader in water resilience by leveraging innovative approaches, strategies and technologies.

- Continue contingency planning to protect and maintain service of key water infrastructure facilities from extreme weather events.
- Evaluate new technologies to lower nutrient releases into the Trinity Watershed from wastewater treatment plants and incorporate as appropriate.
- Evaluate new or improved operational strategies and technologies to optimize the use of chemicals and reduce energy usage at water and wastewater treatment facilities.
- Continue investment in sewer collection system to reduce Inflow/Infiltration to improve water quality and reduce energy usage.

CONSERVE AND PROTECT OUR WATER RESOURCES THROUGH COMMUNITY STEWARDSHIP, EDUCATIONAL PROGRAMS AND BEST MANAGEMENT PRACTICES.

WR1. CONTINUE INVESTMENT IN PUBLIC AWARENESS CAMPAIGNS TO INCREASE KNOWLEDGE OF THE VALUE OF WATER AND IMPORTANCE OF CONSERVATION.

ACTION TYPE
Education; Partnership

ACTION SOURCE
Ongoing Action

PRIMARY BENEFIT
Adaptation

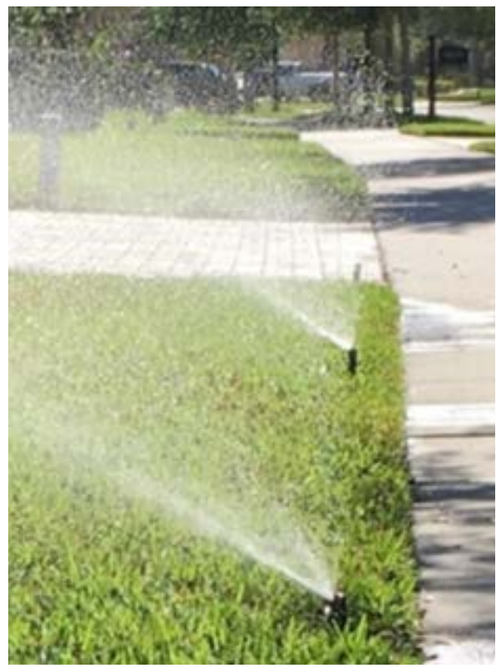
CO-BENEFITS
Stewardship, Education, Resource Conservation

The City will continue to offer rebate and incentive-based programs, and other educational campaigns to promote water conservation, and reduce costs associated with water supply and wastewater to the residential and commercial sectors (including for large water consumers such industrial, commercial, institutional and medical campuses).

The City will continue its public awareness campaigns such as the 'Save Water, Nothing Can Replace It' campaign and collaborate with other regional water providers and agencies to increase awareness of the value of water and promote ways to conserve it.

Additionally, the City will continue its Defend Your Drains public awareness campaign. This program is part of the City's Sanitary Sewer Overflow initiative to reduce wastewater overflows, further protecting the environment.

The City will continue partnering with other regional water providers for a North Texas Region unified education and outreach campaign and share costs. It will continue the ongoing 'Wholesale Customer Outreach Program' to support wholesale customer cities to promote similar public campaigns within their jurisdictions (wholesale customers comprise of about 38% of DWUs' total treated water demand).[33]



EQUITY CONSIDERATIONS

- Cost savings from water bills will benefit vulnerable residents, including low-income households who on average spend a higher proportion of their income on utilities.

CONSERVE AND PROTECT OUR WATER RESOURCES THROUGH COMMUNITY STEWARDSHIP, EDUCATIONAL PROGRAMS AND BEST MANAGEMENT PRACTICES.

WR2. CONTINUE INVESTMENT IN LEAK DETECTION AND EXPAND PROGRAMS TO REDUCE OVERALL WATER LOSS THROUGH THE CONVEYANCE SYSTEMS.

ACTION TYPE
Partnership

ACTION SOURCE
New Action
Ongoing Action

PRIMARY BENEFIT
Adaptation

CO-BENEFITS
Stewardship, Education

The City will continue to invest in and expand leak detection programs that reduce water loss in the conveyance system, including the evaluation of additional stringent requirements for allowable leakage for new and large diameter pipes. DWU has an extensive leak detection and repair program and is committed to maintaining a rate of less than 10 % for unaccounted water losses in its water system.[34]

Wholesale customers comprise about 38% of DWU's total treated water demand.[35] The City will encourage customer cities served by DWU to follow similar stringent water loss guidelines. DWU will work with customer cities to establish an annual reduction target over the next 10-years to reduce water loss through the conveyance system.

WR3. EVALUATE POTENTIAL OPPORTUNITIES AND FINANCIAL FEASIBILITY FOR REUSING WATER FOR NON-DRINKING PURPOSES.

ACTION TYPE
Incentive; Partnership

ACTION SOURCE
New Action

PRIMARY BENEFIT
Adaptation

CO-BENEFITS
Emissions Reduction, Stewardship, Water Quality

DWU will evaluate additional opportunities to recycle water for non-potable purposes. This may include for example, selling to large water users such as golf courses for irrigation, or large medical or education campuses. A significant amount of energy may be conserved by using recycled water in place of drinking water for non-potable purposes without compromising public health.

DWU will continue to identify and partner with potential customers to evaluate the financial feasibility of supplying recycled water from wastewater treatment facilities. Sharing the cost for the necessary infrastructure between wastewater facilities and customers will be explored as a potential financing mechanism.

CONSERVE AND PROTECT OUR WATER RESOURCES THROUGH COMMUNITY STEWARDSHIP, EDUCATIONAL PROGRAMS AND BEST MANAGEMENT PRACTICES.

WR4. ENCOURAGE BUSINESSES AND RESIDENTS TO PLANT DROUGHT-TOLERANT AND NATIVE VEGETATION OR XERISCAPE TO REDUCE IRRIGATION WATER USE.

ACTION TYPE
Incentive
ACTION SOURCE
New Action
Ongoing Action

PRIMARY BENEFIT
Adaptation

CO-BENEFITS
Stewardship, Resource Consumption, Emissions Reduction, Cost Savings

The City will evaluate financial incentives to encourage businesses and residences to shift from green lawns to more drought-tolerant and native vegetation or xeriscape.

In the first phase, the City will continue to offer free irrigation system assessments and develop additional incentives and educational resources to promote reducing outdoor irrigation. Options include but are not limited to the use of smart water technologies such as automated sprinkler systems, turf replacement, and water wise plant selections.

The City will continue ongoing education and outreach programs such as the WaterWise Landscape Tour to promote and recognize landscape design that reduces water consumption for irrigation. In the second phase, the City will take additional steps and further incentivize the transition to native and drought tolerate plant palettes for properties with landscape areas above a certain size.

WR5. CONTINUE TO MONITOR AND PROTECT WATER QUALITY AND IMPLEMENT IMPROVEMENT PROJECTS IN THE WATERSHED.

ACTION TYPE
Partnership
ACTION SOURCE
New Action
Ongoing Action

PRIMARY BENEFIT
Environmental Quality

CO-BENEFITS
Water Quality, Public Health

The City will continue its active participation and collaboration with other agencies within the Trinity Watershed to protect water quality. The City will work with other cities in the watershed towards maintaining regulatory water quality standards in creeks and rivers.

The City will expand its current Stormwater Quality Monitoring Program for streams and creeks to develop methods to include other surface water bodies and expand upon the parameters monitored. The City will implement improvement projects to improve quality as needed.
The City will consider creating a Watershed Protection Plan for White Rock Creek to protect public health. (This creek is currently listed as 'impaired' for bacteria).

CONSERVE AND PROTECT OUR WATER RESOURCES THROUGH COMMUNITY STEWARDSHIP, EDUCATIONAL PROGRAMS AND BEST MANAGEMENT PRACTICES.

WR6. CONTINUE TO PROTECT AND MONITOR WATER QUALITY BY TRACKING EMERGING CONTAMINANTS THAT MAY IMPACT PUBLIC HEALTH.

ACTION TYPE
Program
ACTION SOURCE
Ongoing Action

PRIMARY BENEFIT
Environmental Quality

CO-BENEFITS
Public Health

DWU will enhance its monitoring plan for emerging contaminants that can compromise water quality or public health including, but not limited to Per- and polyfluoroalkyl substances (PFAS) as these substances are carcinogens.

DWU will develop a plan to further educate and support its customers in regulatory driven programs for lead and copper monitoring within schools, childcare centers and public spaces.

EQUITY CONSIDERATIONS

- Contaminants such as lead, that can result from aging infrastructure typically affect communities in neighborhoods that have historically lacked reinvestment. Monitoring water quality in community centers and schools can reduce health risks for all, but especially benefit communities more exposed to these hazards.

WR7. USE FEMA COMMUNITY RATING SYSTEM TO EDUCATE AND PROTECT COMMUNITIES FROM FLOODING.

ACTION TYPE
Incentive
ACTION SOURCE
Ongoing Action

Adaptation, Cost Savings

The Community Rating System (CRS) is a voluntary program for National Flood Insurance Program (NFIP) participating communities. The goal of the rating system is to reduce flood damages to insurable property through a comprehensive approach to floodplain management. The program provides incentives in the form of premium discounts for communities based on the rating it achieves. The program rates communities from Class 1 to Class 10. For CRS participating communities, flood insurance premium rates are discounted in increments of 5% (i.e., a Class 1 community would receive a 45% premium discount, while a Class 9 community would receive a 5% discount).

Credit points are allotted based upon completion of 19 possible initiatives identified by the program. The City of Dallas currently has a Class 5 Rating and is evaluating the financial feasibility for undertaking additional initiatives to qualify for a Class 4 rating. The rating system is utilized as a tool to educate and protect communities from flooding.

EQUITY CONSIDERATIONS

- This program increases the affordability of insurance for property owners located within the floodplain.

PROTECT NEIGHBORHOODS FROM FLOODING AND PREPARE THEM FOR DROUGHTS.

WR8. COMPLETE THE IMPLEMENTATION OF MAJOR PLANNED AND ONGOING DRAINAGE INFRASTRUCTURE PROJECTS TO IMPROVE COMMUNITY RESILIENCE TO FLOODING.

ACTION TYPE
Partnership
ACTION SOURCE
Ongoing Action

PRIMARY BENEFIT
Adaptation

CO-BENEFITS
Cost Savings

The City will continue to fund and implement ongoing drainage infrastructure projects such as the Mill Creek Drainage Relief Tunnel, and Dallas Floodway/Dallas Floodway Extension. The Mill Creek Drainage Relief Tunnel is a five-mile-long underground tunnel that is currently under construction and will provide flood relief to a large portion of east Dallas. The Dallas Floodway/Dallas Floodway Extension projects are along the Trinity River and the City of Dallas is currently partnering with the United States Army Corps of Engineers (USACE) for implementation (including through use of USACE federal funds). The completion of these projects will improve resilience for flood prone communities.

EQUITY CONSIDERATIONS

- This project will reduce the risk of flooding for all communities, however, vulnerable communities are more likely to be in or near floodplains.

WR9. INITIATE A COMPREHENSIVE STORM DRAINAGE SYSTEM ASSESSMENT AND PLANNING PROCESS.

ACTION TYPE
Plan; Assessment
ACTION SOURCE
New Action

PRIMARY BENEFIT
Adaptation

CO-BENEFITS
Public Health

DWU will initiate a comprehensive storm drainage system assessment by evaluating the existing storm drainage system and identifying critical improvements and funding necessary for implementation. The assessment will identify measures and priorities to reduce flooding now and under future climate conditions to protect lives and property.

This assessment will help the City identify critical projects to be funded through the long-term Capital Improvement Plan. The City will evaluate other funding mechanisms such as low interest loans and State grants through the Texas Water Development Board (TWDB) flood program to implement critical projects.

PROTECT NEIGHBORHOODS FROM FLOODING AND PREPARE THEM FOR DROUGHTS.

WR10. EVALUATE POLICIES AFFECTING DRAINAGE AND EROSION TO ENSURE SUSTAINABLE DEVELOPMENT AND MITIGATE ADVERSE IMPACTS.

ACTION TYPE
Plan; Assessment
ACTION SOURCE
New Action

PRIMARY BENEFIT
Adaptation

CO-BENEFITS
Water Quality
Public Health
Resource Conservation

The City will evaluate policies that affect erosion and suggest measures to mitigate its impacts. A decrease in water quality and property impacts due to soil erosion in streams within the watershed is a concern. The City will also evaluate guidelines for riparian buffers and design guidelines along streams to minimize erosion, protect property, and protect water quality.

Finally, the City will evaluate policies affecting drainage particularly in communities prone to localized flooding and identify measures to reduce its impact. Measures can include modification of building design to protect from water damage, opportunities to incorporate green infrastructure solutions, and installation of flood protection measures.

WR11. CONTINUE MONITORING, EVALUATING AND UPDATING THE DROUGHT CONTINGENCY PLAN.

ACTION TYPE
Plan
ACTION SOURCE
Ongoing Action

PRIMARY BENEFIT
Adaptation

CO-BENEFITS
Public Health
Resource Conservation

The Drought Contingency Plan describes the conditions that require short-term water demand management and establishes policies and procedures that offer strategies for a timely and effective response. In general, such a response would be needed when water use in the area served by DWU approaches the system's supply, treatment, or delivery capacity. The plan is implemented only during these situations. Examples include drought conditions, unusually high-water demands, unforeseen equipment or system failure, or contamination of a water supply source. The plan identifies different restrictions for all users based on the drought stage (1, 2, or 3) and methods to enforce these. The City will continue to monitor and evaluate the effectiveness of the Plan and update it as necessary.

BE A REGIONAL LEADER IN WATER RESILIENCE BY LEVERAGING INNOVATIVE APPROACHES, STRATEGIES AND TECHNOLOGIES

WR12. CONTINUE CONTINGENCY PLANNING TO PROTECT AND MAINTAIN SERVICE OF KEY WATER INFRASTRUCTURE FACILITIES FROM EXTREME WEATHER EVENTS.

ACTION TYPE
Plan; Assessment
ACTION SOURCE
New Action

PRIMARY BENEFIT
Adaptation

CO-BENEFITS
Cost Savings
Emissions Reduction

As part of the ongoing Risk and Resilience Assessment of the DWU water system, the vulnerability of drinking water facilities to extreme weather events will be assessed and strategies will be identified to mitigate their impacts. Parameters such as road access to facilities, capacity of facilities during extreme weather events and energy sources to power these facilities will be assessed. In addition to drinking water treatment DWU plans to conduct a similar assessment for wastewater and stormwater facilities in the future and recommendations from these assessments will be evaluated for implementation.

DWU will evaluate the potential to install secondary power sources including but not limited to solar panels, battery storage and generators for critical infrastructure to provide resilience during potential future grid outages.

WR13. EVALUATE NEW TECHNOLOGIES TO LOWER NUTRIENT RELEASES INTO THE TRINITY WATERSHED FROM WASTEWATER TREATMENT PLANTS AND INCORPORATE AS APPROPRIATE.

ACTION TYPE
Plan; Assessment
ACTION SOURCE
New Action

PRIMARY BENEFIT
Environmental Quality

CO-BENEFITS
Public Health

DWU will evaluate implementation of Biological Nutrient Removal processes at the Central and Southside wastewater treatment plants. These are processes that will improve water quality by removing additional nitrogen and phosphorus from wastewater before it is discharged into the Trinity River. DWU will evaluate the financial feasibility of implementing these nutrient recovery projects and implement them as appropriate and in accordance with regulatory requirements.

BE A REGIONAL LEADER IN WATER RESILIENCE BY LEVERAGING INNOVATIVE APPROACHES, STRATEGIES AND TECHNOLOGIES

WR14. EVALUATE NEW OR IMPROVED OPERATIONAL STRATEGIES AND TECHNOLOGIES TO OPTIMIZE THE USE OF CHEMICALS AND REDUCE ENERGY USAGE AT WATER AND WASTEWATER TREATMENT FACILITIES.

ACTION TYPE
Plan; Assessment
ACTION SOURCE
New Action
Ongoing Action

PRIMARY BENEFIT
Environmental Quality

CO-BENEFITS
Public Health
Cost Savings
Emissions Reduction

As part of the ongoing 'Water Production Facilities Strategic Master Plan' and the upcoming 'Wastewater Facilities Strategic Master Plan Update', DWU will evaluate opportunities to optimize current operations by reducing the overall use of chemicals and energy consumption. DWU will evaluate strategies and new technologies to increase efficiency and shift water and wastewater treatment plants to energy-neutral or reduced energy facilities, including the addition of photovoltaic panels.

EQUITY CONSIDERATIONS

- The City of Dallas follows EPA affordability guidelines to ensure the cost of service is affordable to all customers.

WR15. CONTINUE INVESTMENT IN SEWER COLLECTION SYSTEM TO REDUCE INFLOW/INFILTRATION TO IMPROVE WATER QUALITY AND REDUCE ENERGY USAGE.

ACTION TYPE
Program
ACTION SOURCE
Ongoing Action

PRIMARY BENEFIT
Environmental Quality

CO-BENEFITS
Public Health

The City will continue to invest in its collection system to reduce the overall I/I. Inflow refers to the amount of stormwater conveyed via illegal connections or non-sealed access points and infiltration refers to the amount of water that seeps into these pipes during storm events. The reduction of I/I will reduce wet weather sanitary sewer overflows and help improve the resilience of wastewater treatment plants, lift stations, and the overall collection system during major storm events. The investment can be in the form of sanitary sewer evaluation studies, point repairs and pipe replacement, and closed-circuit television (CCTV) inspection of large diameter pipes along major waterways.

EQUITY CONSIDERATIONS

- Improvements made to the collection system will help to prevent vulnerable communities with aging and undersized infrastructure from experiencing sanitary sewer overflows.

GOAL 6: DALLAS PROTECTS AND ENHANCES ITS ECOSYSTEMS, TREES AND GREEN SPACES THAT IN TURN IMPROVE PUBLIC HEALTH.

Why Ecosystems Matter p. 137

Building on City Achievements p. 141

What can I do? p. 142

Actions p. 143

TARGETS

33%, 37% AND 40% OR MORE CANOPY COVER CITYWIDE BY 2030, 2040, 2050, RESPECTIVELY.

20%, 50% AND 75% REDUCTION IN URBAN HEAT ISLAND INDEX BY 2030, 2040, 2050, RESPECTIVELY.

80%, 90% AND 95% OF THE POPULATION LIVES WITHIN MILE WALK TO A PARK OR TRAIL BY 2030, 2040, 2050, RESPECTIVELY.

WHY ECOSYSTEMS MATTER

In Dallas, there are 388 parks totaling 27,038 acres, plus the roughly 6000-acre Great Trinity Forest. These green spaces are not evenly distributed and only 60% of Dallas residents have access to a park within a half-mile walk of their homes. This is relatively low when compared to peer cities such as Chicago (97%), Seattle (94%) and Denver (84%).[36]

Increased temperatures and droughts have dire impacts on urban ecosystems, trees, and green spaces. In 2011, the drought killed approximately 5.6 million trees in urban areas across the state.[37] Since much of Texas is covered in clay-rich soils that expand and contract when soil moisture is lost, it also resulted in schools and recreation centers closing more than two dozen athletic fields due to cracks in the soil of up to two feet deep.

Figures 29 and 30 compare tree canopy cover with average temperature, illustrating the impact trees have on ambient temperature. Open spaces including parks, urban forests, and prairies can deliver multiple benefits including reducing the urban heat island effect, sequestering carbon, managing flooding, as well as providing benefits to urban and migrating species in the form of habitat protection and biodiversity.

Ecosystem health, in turn, protects human health by providing benefits such as opportunities for activity that reduce stress, and increase overall mental and physical wellness.

Figures 31 and 32 on the following page, show existing open space and underutilized land (such as vacant properties) compared with areas prone to flooding (higher risk shown in pink). Areas with a higher risk of flooding already overlap with much of the City's green infrastructure, but there are further opportunities to expand the network to mitigate flooding.

Solutions in this section build upon and strengthen ongoing initiatives to increase tree canopy, improve and increase park spaces, and promote community stewardship in partnership with other organizations. Dallas can significantly reduce the urban heat island effect by preserving and expanding the urban forest, in combination with increased use of light-colored materials in the urban realm.

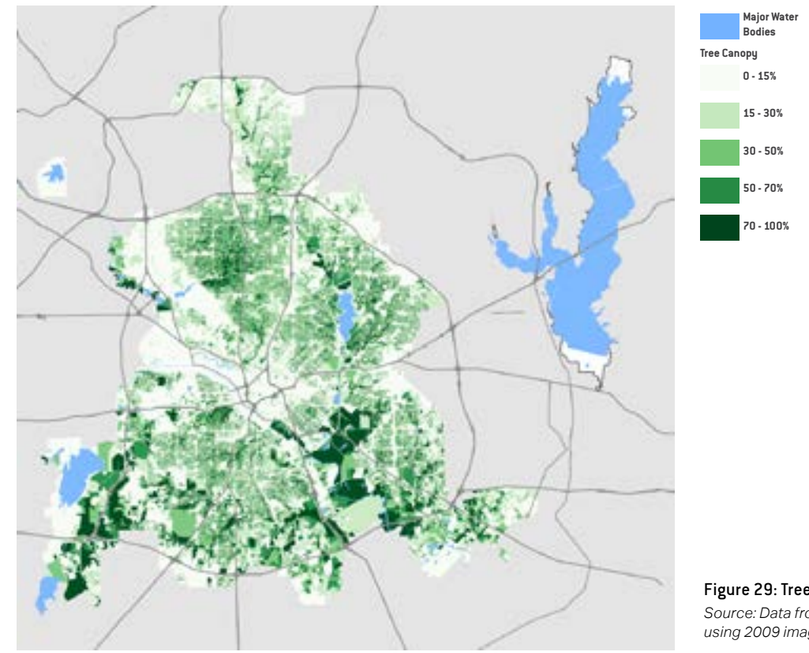


Figure 29: Tree canopy in Dallas
Source: Data from Texas Trees Foundation using 2009 imagery

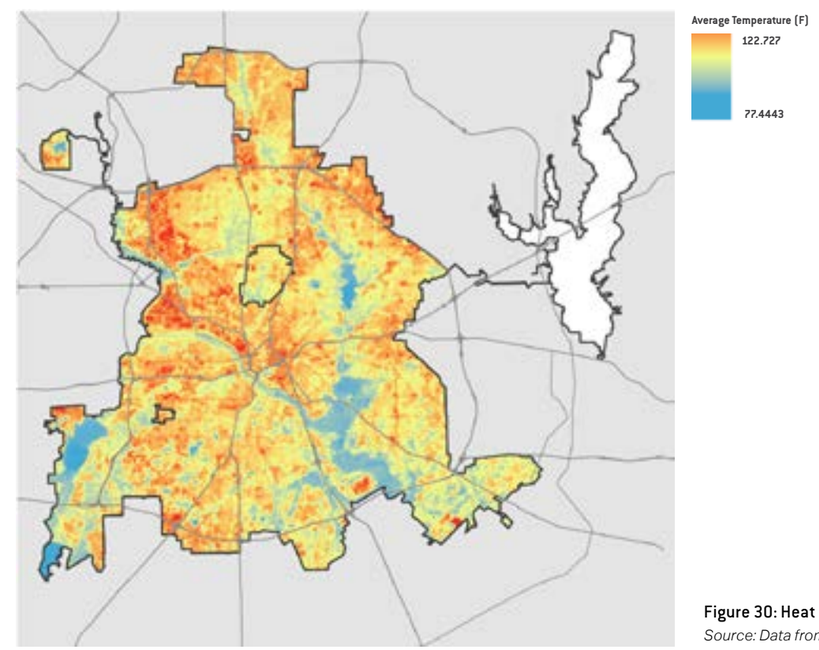
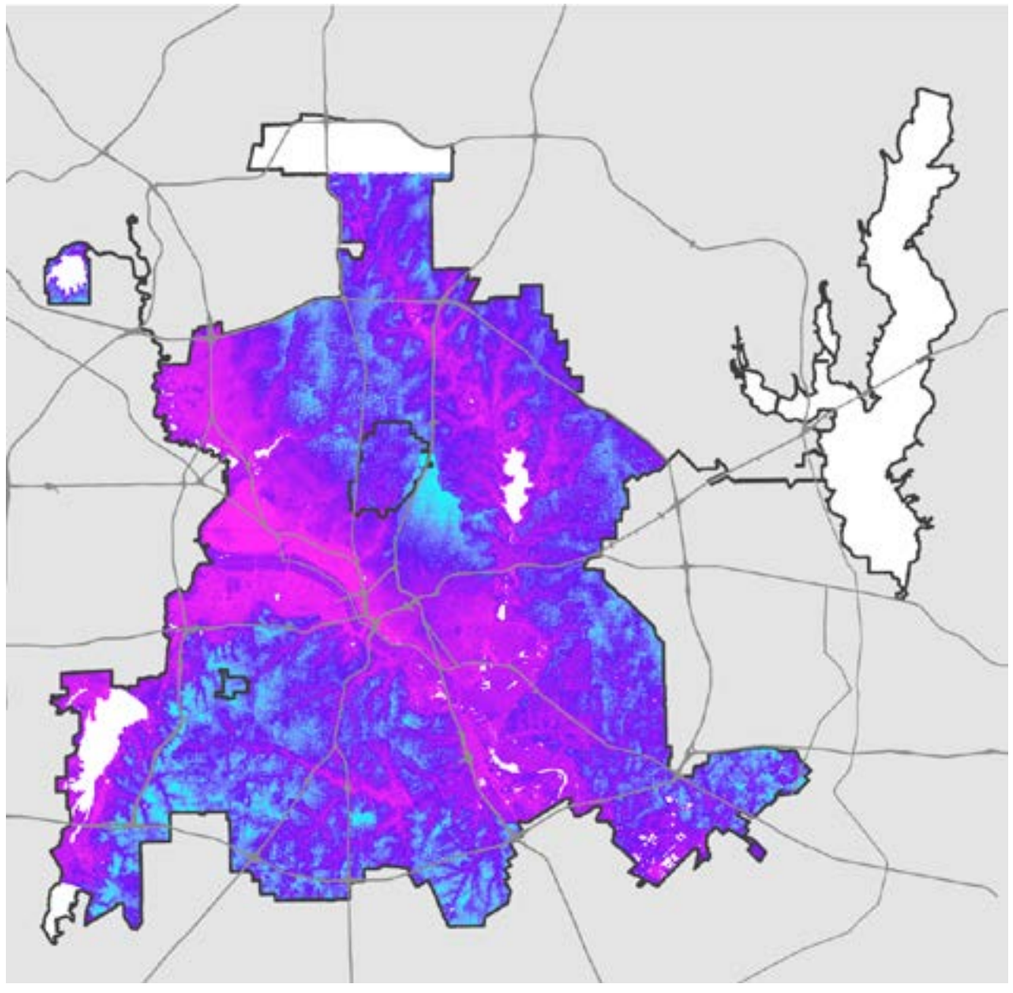


Figure 30: Heat island in Dallas
Source: Data from NASA 2016



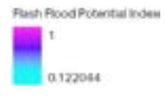


Figure 31: Flood risk index
(Composite index based on soil infiltration capacity, land cover, slope, topographic wetness index, height above nearest drainage and height above the watershed outlet)

Source: Data from SMU, modelled by Rivera,S. 2018

COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN

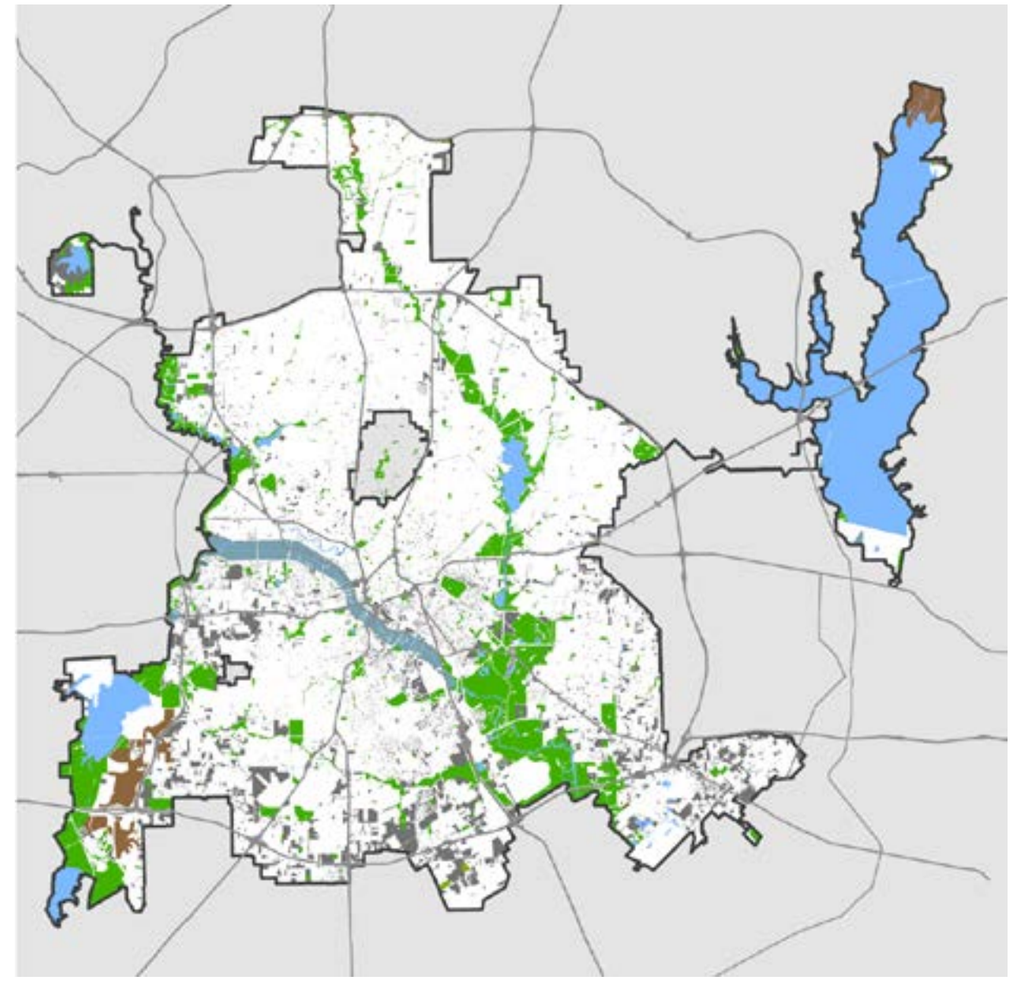


Figure 32: Green infrastructure opportunities
(Undeveloped land uses by parcel)

Source: City of Dallas 2019

BUILDING ON CITY ACHIEVEMENTS

The Branch Out Dallas program is a tree sapling giveaway program for residents. Close to 5,000 saplings are distributed each year.

It was started in 2018 as an effort to reduce the heat island effect and to increase the overall tree canopy in the city. Each tree planted helps get closer to meeting these goals.

WHAT CAN I DO?

Residents

01 Help combat urban heat and help the City increase its urban tree canopy by **planting a free tree** provided by Branch Out Dallas.

02 Want to learn more? **Join the WaterWise Landscape Tour** to visit community gardens and learn how your neighbors grow native plants, compost their food waste, grow pollinator gardens, and use stones to create cool landscapes among other things.

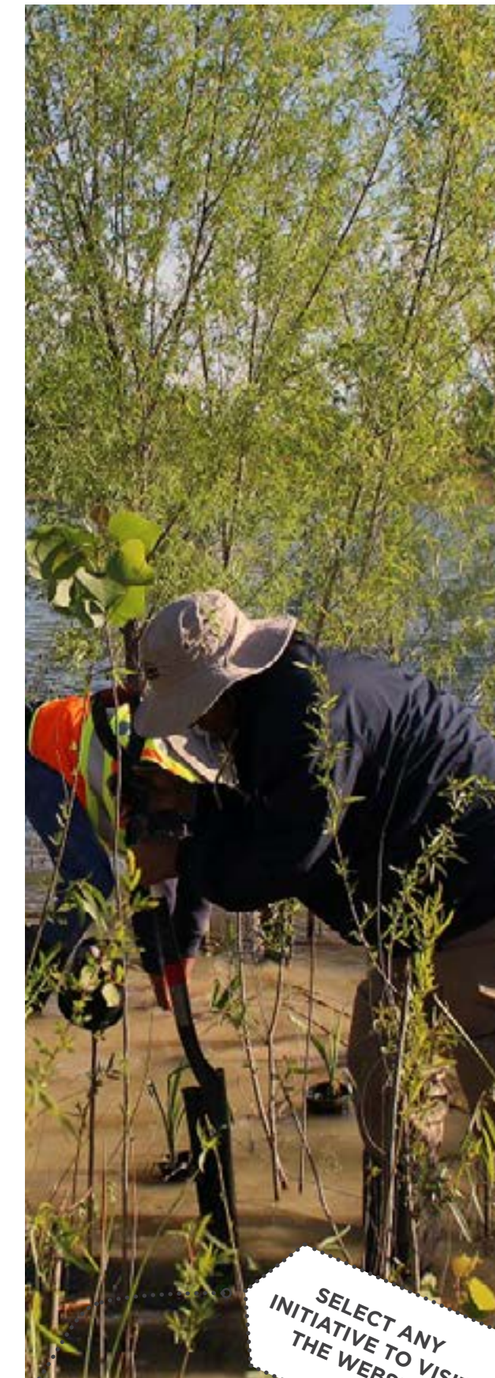
03 Use the TexasSmartScape tool to design and **plant your own pollinator garden** to attract butterflies, bees, and hummingbirds.

04 **Join the Citizen Forester program** to help restore our urban forest. Learn about the benefits of trees and skills such as tree identification, planting and pruning. Upon graduation, citizen foresters can become the eyes, ears and hands for the City Arborists and support public safety.

Businesses

01 Volunteer your time with Texas Trees Foundation to plant trees and help **keep your community cool**.

02 Increase planting, green areas and trees **on your property**!



SELECT ANY INITIATIVE TO VISIT THE WEBSITE

COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN

SELECT ANY ACTION TO SKIP DIRECTLY TO THAT PAGE

06 Dallas protects and enhances its ECOSYTEMS, trees and green spaces that in turn improve public health.

Leverage green spaces to provide climate adaptation benefits

- Increase and improve access to green spaces particularly within vulnerable communities to reduce impact of urban heat island, localized flooding and improve public health.
- Assess opportunities for blue-green infrastructure in the public realm to reduce flood risk.

Increase, enhance and maintain healthy forests, parks, and green spaces.

- Increase tree canopy in both private and public realm to complete implementation of recommendations from the Urban Forest Masterplan.
- Continue ongoing programs to collaborate with community organizations to promote tree planting efforts, protection of trees and prairies, and drought tolerant landscapes.
- Update City Park operations and maintenance procedures to include comprehensive ecofriendly and sustainable best management practices.
- Partner with local universities, schools and NGOs and launch projects for community members to help inventory urban trees.
- Develop a City Forest Carbon Credits program to quantify and monetize sequestered carbon in urban trees.

Integrate nature-based solutions into the public realm as a public health strategy.

- Improve the quality of urban ecosystems in Dallas through the sustainable appropriate design, creation and planting of urban habitats.
- Support public and private partnerships using nature-based solutions to address public health challenges.

LEVERAGE GREEN SPACES TO PROVIDE CLIMATE ADAPTATION BENEFITS

EG1. INCREASE AND IMPROVE ACCESS TO GREEN SPACES PARTICULARLY WITHIN VULNERABLE COMMUNITIES TO REDUCE IMPACT OF URBAN HEAT ISLAND, LOCALIZED FLOODING AND IMPROVE PUBLIC HEALTH.

ACTION TYPE
Program

ACTION SOURCE
New Action

PRIMARY BENEFIT

Adaptation

CO-BENEFITS

Emissions Reduction | Air Quality | Water Quality | Public Health | Inequality | Resource Conservation

The Smart Growth for Dallas mapping study identified locations in the city where open space is needed to reduce the urban heat island effect, flooding and to provide recreational opportunities. The City will identify city-owned vacant properties within these areas, prioritizing underserved neighborhoods, that can be transformed into pocket parks or pocket prairies (which require less maintenance compared to more traditional parks).

The City will evaluate city-owned properties and identify opportunities to convert under-utilized areas such as public parking lots, space under freeways rooftops, etc. into gardens, parklets, vertical green walls or other public green spaces. If there isn't adequate city owned space within priority neighborhoods, the City should identify other vacant properties that could be leveraged.

At the city-wide scale, neighborhood-based targets will be adopted for reducing urban heat and stormwater run-off in a way that can inform land development decision making. Currently decisions are made on a site-specific case by case basis for new development. Building upon The 'Urban Heat Island Management Study (2017)' and Smart Growth for Dallas mapping study, the Comprehensive Plan update will adopt neighborhood level targets for greening, cooling and stormwater runoff reduction strategies.

To maintain the ecosystem services and floodproofing function that the Great Trinity Forest provides the City will update the Great Trinity Forest Management Plan and implement its recommendations. This includes assessing species diversity, planting targets, and canopy health management suitable for the changing climate and other best practices.

EQUITY CONSIDERATIONS

- This action will increase access to greenspaces for vulnerable communities and property values may rise as a result. Robust affordability and neighborhood stabilization strategies should be considered to prevent the displacement of existing residents.

LEVERAGE GREEN SPACES TO PROVIDE CLIMATE ADAPTATION BENEFITS

EG2. ASSESS OPPORTUNITIES FOR BLUE-GREEN INFRASTRUCTURE IN THE PUBLIC REALM TO REDUCE FLOOD RISK.

ACTION TYPE
Plan; Assessment

ACTION SOURCE
New Action

PRIMARY BENEFIT

Adaptation

CO-BENEFITS

Emissions Reduction | Air Quality | Water Quality | Public Health | Resource Conservation

The City will identify areas prone to flood risk (now and from future flood events) such as neighborhoods located on floodplains along the Trinity River and evaluate whether green infrastructure may be a solution in that area to mitigate flood impact. This will include city parks as potential flood retention areas. The 'Drainage Design Manual (2019)' and the 'Complete Streets Design Manual (2013)' provide design guidelines.

EQUITY CONSIDERATIONS

- The installation of the green-blue infrastructure will be prioritized in communities most vulnerable to flooding, and currently least able to deal with the consequences.

Credit: R.J. Hinkle

IINCREASE, ENHANCE AND MAINTAIN HEALTHY FORESTS, PARKS, AND GREEN SPACES.

EG3. INCREASE TREE CANOPY IN BOTH PRIVATE AND PUBLIC REALM TO COMPLETE IMPLEMENTATION OF RECOMMENDATIONS FROM THE URBAN FOREST MASTERPLAN.

ACTION TYPE
Program
ACTION SOURCE
New Action

PRIMARY BENEFIT
Adaptation

CO-BENEFITS
Emissions Reduction, Air Quality, Water Quality, Public Health

The City will implement the actions in the Dallas Urban Forest Master Plan, which aims to unite urban forestry efforts and provides strategies to mitigate the urban heat island effect. The 'Dallas Urban Heat Island Management Study (2017)' recommends planting approximately 250,000 trees across the city to achieve significant cooling and health benefits. The benefits of greening strategies can be as high as 15°F of cooling in some areas on hot summer days (Texas Trees Foundation 2017).

The City will actively manage the long-term health of Dallas' urban forest by removing invasive species', establishing protocols for assessing canopy loss, managing debris, replanting and monitoring, and prioritizing tree planting after storms and droughts in areas that suffer canopy cover loss.
Vulnerable neighborhoods most impacted by the heat island effect, streets without sidewalk trees and corridors with high pedestrian traffic will be prioritized for tree planting to improve walkability and pedestrian comfort.

Credit: BJ Hinkle

EQUITY CONSIDERATIONS
- Planting efforts in vulnerable communities increase the adaptive capacity to extreme heat.
- Residents in vulnerable areas may not be able to maintain any new trees planted or pay for irrigation, so support should be provided to maintain any new trees planted in these neighborhoods.
- This action will increase access to greenspaces for vulnerable communities and property values may rise as a result. Therefore robust affordability and neighborhood stabilization strategies should be considered to prevent the displacement of existing residents.

IINCREASE, ENHANCE AND MAINTAIN HEALTHY FORESTS, PARKS, AND GREEN SPACES.

EG4. CONTINUE ONGOING PROGRAMS TO COLLABORATE WITH COMMUNITY ORGANIZATIONS TO PROMOTE TREE PLANTING EFFORTS, PROTECTION OF TREES AND PRAIRIES, AND DROUGHT TOLERANT LANDSCAPES.

ACTION TYPE
Educational; Program
ACTION SOURCE
Ongoing Action

PRIMARY BENEFIT
Adaptation

CO-BENEFITS
Emissions Reduction, Air Quality, Water Quality, Public Health, Employment

In addition to implementing the Urban Forest Masterplan described in Action EG2, the City will work with community-based organizations on existing and new land stewardship programs that educate residents and businesses about the benefits of tree planting and native, drought tolerant landscapes in North Texas. In addition, the City will provide educational resources on best practices for maintaining mature trees. The City will support partnerships and initiatives that protect and expand the native Blackland Prairies. The City will continue to support ongoing efforts such as Branch out Dallas and City of Dallas Reforestation Program to offer resources, technical assistance and volunteer labor and encourage private property owners to plant trees on their property.

EQUITY CONSIDERATIONS
- Planting efforts in vulnerable communities increase the capacity to adapt to extreme heat.
- This action will increase access to greenspaces for vulnerable communities and property values may rise as a result. Therefore, robust affordability and neighborhood stabilization strategies should be considered to prevent the displacement of existing residents.

EG5. UPDATE CITY PARK OPERATIONS AND MAINTENANCE PROCEDURES TO INCLUDE COMPREHENSIVE ECOFRIENDLY AND SUSTAINABLE BEST MANAGEMENT PRACTICES PRACTICES.

ACTION TYPE
Plan; Assessment
ACTION SOURCE
New Action

PRIMARY BENEFIT
Environmental Quality

CO-BENEFITS
Education, Air Quality

The City will update its park operations and maintenance procedures to include comprehensive ecofriendly and sustainable practices. This will build on the current efforts and practices established by the Department of Parks and Recreation and include strategies such as using reclaimed water to irrigate City parks, using integrated pest management and organic pesticides and fertilizers, composting organic waste collected in the park premises, contracting International Society of Arboriculture (ISA) certified companies for tree maintenance, and transitioning from gasoline to electric leaf blowers and lawn mowers. To ensure implementation of the new practices, City parks maintenance staff will be trained on the updated sustainable practices.

IINCREASE, ENHANCE AND MAINTAIN HEALTHY FORESTS, PARKS, AND GREEN SPACES.

EG6. PARTNER WITH LOCAL UNIVERSITIES, SCHOOLS AND NGOS AND LAUNCH PROJECTS FOR COMMUNITY MEMBERS TO HELP INVENTORY URBAN TREES.

ACTION TYPE
Partnership
ACTION SOURCE
New Action

PRIMARY BENEFIT
Environmental Quality

CO-BENEFITS
Stewardship, Education, Resource Conservation

A City-wide tree inventory will help monitor the health and diversity of trees in the public and private realm and estimate carbon sequestered. The City will partner with organizations who initiate and maintain programs to capture data on urban trees in North Texas. Existing inventories such as 'Downtown Dallas Tree Inventory & Ecosystem Services Benefits Report (2015)' and 'University of North Texas at Dallas Campus Tree Inventory & Ecosystem Service Benefits Report (2016)' will be compiled on one platform.

The City will coordinate with local organizations to encourage consistent methods. Existing tools like 'inaturalist' enable community members to record observations and learn about local flora and fauna in their bioregion. The City should utilize this data to inform decisions about urban ecosystems and forest management.

EG7. DEVELOP A CITY FOREST CARBON CREDITS PROGRAM TO QUANTIFY AND MONETIZE SEQUESTERED CARBON IN URBAN TREES.

ACTION TYPE
Program
ACTION SOURCE
New Action

Mitigation

Resource Conservation

The City will evaluate the potential to set up a carbon credits program. The program would quantify the carbon sequestered through urban trees. These credits may be used as a potential way to fund CECAP implementation; additionally carbon credit programs require measures to maintain, preserve and protect the urban canopy in areas subject to the carbon credit program, and so can serve to help ensure appropriate care of this resource.

Each credit can potentially monetize:

- Metric tons of CO_2
- Rainfall interception in cubic meters/year
- Air quality benefits in tons/year
- Energy savings in kWh/yr

A similar program called 'City Forest Carbon Program' is being piloted by the City of Austin, and several other U.S. cities.

INTEGRATE NATURE-BASED SOLUTIONS INTO THE PUBLIC REALM AS A PUBLIC HEALTH STRATEGY.

EG8. IMPROVE THE QUALITY OF URBAN ECOSYSTEMS IN DALLAS THROUGH THE SUSTAINABLE APPROPRIATE DESIGN, CREATION AND PLANTING OF URBAN HABITATS.

ACTION TYPE
Education
ACTION SOURCE
New Action

PRIMARY BENEFIT
Environmental Quality

CO-BENEFITS
Education, Resource Conservation

The City will evaluate locations for potential wildlife corridors to create contiguous habitats across the city. A comprehensive assessment will be conducted to identify potential wildlife corridors. The study will also identify policies and implementation mechanisms for creating these corridors (for example through the Comprehensive Plan update).

In addition, education programs will be developed on creating urban habitats, pollinator gardens and bee keeping. Guidance for developers will be provided on urban design-based strategies for the creation of bird-friendly developments, buildings, and structures.

EG9. SUPPORT PUBLIC AND PRIVATE PARTNERSHIPS USING NATURE-BASED SOLUTIONS TO ADDRESS PUBLIC HEALTH CHALLENGES.

ACTION TYPE
Program
ACTION SOURCE
New Action

Environmental Justice

Education, Public Health, Employment

The City will support and encourage public and private partnerships for initiatives using nature-based solutions to address public health challenges. The City will encourage partnerships, provide technical assistance with grant writing, informational resources on funding opportunities and other creative financing options to nonprofits that are working on initiatives or programs that aim to address public health challenges using nature-based solutions.

A successful example of this is the 'Southwestern Medical District Urban Streetscape Master Plan (2016)'. This is an ongoing district wide streetscape project that emphasizes and supports public health through nature-based solutions in a neighborhood that has only 7% tree canopy and is a major urban heat island. The project is a result of a partnership between Southwestern Medical District and Texas Trees Foundation with support from City of Dallas and other stakeholders.

EQUITY CONSIDERATIONS

- The City will prioritize environmental justice programs that alleviate burdens in vulnerable communities.

GOAL 7: ALL DALLAS' COMMUNITIES HAVE ACCESS TO HEALTHY, LOCAL FOOD.

Why Food and Urban Agriculture Matters p. 153

Building on City Achievements p. 155

What can I do? p. 156

Actions p. 157

TARGETS

50%, 75%, 100% OF THE POPULATION LIVES HAS ACCESS TO HEALTHY, AFFORDABLE FOOD BY 2030, 2040, AND 2050.*

INCREASE BY 20%, 50%, 75% THE ACREAGE OF URBAN GARDENS PRODUCING FOOD BY 2030, 2040, AND 2050.**

INCREASE BY 10%, 25%, 50% OR MORE RESTAURANTS, FARM STANDS, OR MARKETS SOURCING FROM LOCAL PRODUCERS BY 2030, 2040, AND 2050.

*within 1/2 mile walk or 10-minute drive
**for community distribution, local markets or restaurants

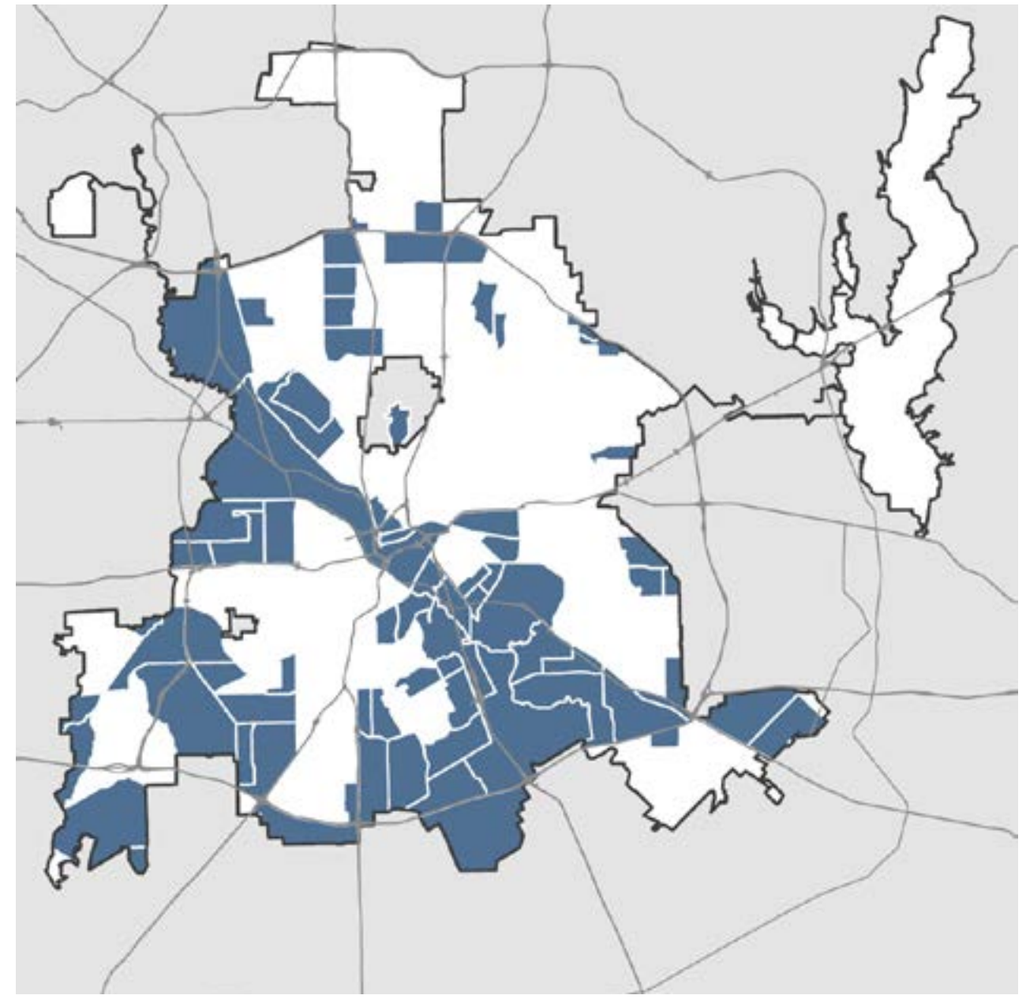
WHY FOOD AND URBAN AGRICULTURE MATTERS

Access to healthy food for vulnerable communities in southern and western Dallas is a significant challenge—36% of Dallas' residents live in census tracts defined as food deserts. The USDA defines food deserts as low-income areas with low access to vehicles and with no grocers within one mile. Lack of access to food is also complicated by other issues such as income, education and race. This leads to additional public health challenges for a population also dealing with respiratory illness related to poor air quality. **Figure 33** shows census tracts with low food access.

Food production, distribution and land use accounts for 30% of global GHG emissions. In the U.S., 4% of the food sold is beef, which accounts for 36% of food-related emissions. Rising temperatures, changing precipitation patterns, and more frequent droughts may result in losses to crops and livestock across the nation and globe and could lead to increased food prices. The region's food is heavily dependent on food suppliers from outside of Texas and the United States. Extreme weather events can lead to power outages, and damage to transportation infrastructure, which may lead to supply chain vulnerability and food spoilage. Communities who already face food insecurity become more vulnerable to the above-mentioned impacts. Food security is defined as 'a condition in which all community residents obtain a safe, culturally appropriate, nutritionally sound diet through an economically and environmentally sustainable food system that promotes community self-reliance and social justice'. [38]

There are inextricable links between food and urban agriculture and other sectors. Sustainable methods of agriculture support healthy ecosystems and play a role in carbon sequestration. Local food production reduces emissions related to 'food miles' and stimulates local economic development and green jobs. For the purpose of food-related efforts in Dallas, 'local' will be defined as food grown within the State of Texas. Green jobs are defined as 'jobs in businesses that produce goods or provide services that benefit the environment or conserve natural resources or jobs in which workers' duties involve making their establishment's production processes more environmentally friendly or use fewer natural resources.'[39]

The 2015 greenhouse gas inventory is a conventional sector-based inventory. This means that the benefit of local actions related to food may not be accounted for directly in the City's future inventory updates (unless the City decides to do a consumption-based inventory) but will still make an impact at the global scale. Solutions in this sector target emissions reductions at each stage of the food supply chain; however, most actions focus on equity and address issues such as food access and food security.



Low Income and Low Access Census Tracts

Figure 33: Census tracts with Low Income And Low Access (1 Mile) to Grocery Stores

Source: USDA 2015

BUILDING ON CITY ACHIEVEMENTS

The City of Dallas Office of Innovation, in partnership with the Communities Foundation of Texas, conducted a 'Food Innovation Challenge' to crowd source creative ideas to increase access to local, nutritious and affordable food options for all Dallas residents.

The challenge gives Dallas residents the opportunity to submit ideas and solutions on how the to solve food inequities in their communities. Ultimately, it will aid the City's efforts in having better food access, healthier food choices, more locally-grown food and reduce food waste.

WHAT CAN I DO?

Residents

01 Find and **join a local CSA** (Community Supported Agriculture), which is a membership to a small farm, that provides fresh, local produce each week.

02 **Join Bonton Farms**, a community-based urban farm or shop for local produce and other goods at their market.

03 Help improve food security in your community by contributing food, donating to, or **volunteering for the North Texas Food Bank**.

04 **Learn about how you can grow your own produce** at home from the Dallas County Master Gardener Association.

Businesses

01 **Donate surplus food** to the North Texas Food Bank, which provides 200,000 meals per day to residents facing hunger.

02 Foodsource DFW helps businesses facilitate large donations of surplus foods and resources that would otherwise go to waste to those in need. **Schedule a free tax-deductible pickup** and Foodsource DFW will distribute the food to a network of regional food banks.

03 All food services businesses, but especially full-service hotels, can use the **Hotel Kitchen Toolkit** to identify ways they can reduce food waste. Participating hotels have seen reductions in food waste of 10-38% in just 12 weeks.

Credit: U.S. Navy

SELECT ANY INITIATIVE TO VISIT THE WEBSITE

SELECT ANY ACTION TO SKIP DIRECTLY TO THAT PAGE

07 | All Dallas' communities have access to healthy, local FOOD.

Build organizational capacity and partnerships around an urban agriculture network.

- Increase access to information on sustainable agriculture, best practices and the benefits of healthy and local foods.
- Create a Food Advisory Council.
- Develop a Dallas comprehensive food and urban agriculture plan.

Improve food access in neighborhoods with low food access.

- Facilitate partnerships between schools and nonprofits to develop neighborhood-based growing initiatives and kitchen gardens in neighborhoods with low food access.
- Support nonprofits solving food justice issues in Dallas with grant writing and developing creative financing options.
- Partner with transportation organizations to identify creative transportation solutions to access healthy food retailers in neighborhoods with low food access.
- Partner with supermarkets, food retailers and other supporting organizations to bring mobile grocery stores to neighborhoods with low food access.

Reduce food miles by encouraging local food production and consumption.

- Support the creation of food related green jobs in production, processing, storage, distribution and waste management.
- Establish a local food procurement plan to encourage local food purchasing at City-sponsored events.
- Enhance the market by providing incentives to sell locally produced food at affordable prices.

Prepare the food system to be more resilient to extreme weather events.

- Increase food security by supporting stakeholders in the food systems food supply chain with tools to plan for changing weather and extreme events.
- Identify opportunities for controlled-environment agriculture to increase local food production that are less energy and water intensive and protected from climate extremes.

Prevent food waste through food donations, recovery, diversion and composting.

- Collaborate with organizations who are working to divert surplus food from grocery stores and markets to reach communities in need.
- Adopt a special events ordinance that encourages procurement of locally sourced food, recycling of waste generated and compost bins at special events.
- Adopt an ordinance to implement a city-wide organics management program.

BUILD ORGANIZATIONAL CAPACITY AND PARTNERSHIPS AROUND AN URBAN AGRICULTURE NETWORK

FA1. INCREASE ACCESS TO INFORMATION ON SUSTAINABLE AGRICULTURE, BEST PRACTICES AND THE BENEFITS OF HEALTHY AND LOCAL FOODS.

ACTION TYPE
Educational
ACTION SOURCE
New Action

PRIMARY BENEFIT
Adaptation

CO-BENEFITS
Public Health, Cost savings, Education

The City will create a multi-faceted campaign aimed at a range of audiences to share informational resources on sustainable agriculture, locally sourced goods, edible landscapes and low carbon diets.

The City will provide technical assistance on urban farming in North Texas to residents, HOAs, and restaurants interested in initiating their own projects. This may include sustainable growing methods such as permaculture, restorative farming, rewilding, hydroponics, aquaponics, etc., sharing seeds and starters, and tool giveaways.

The City will identify opportunities to increase consumer awareness of food origins and share the impacts of food products grown/raised in tropical locations that might use slash-and-burn deforestation practices. The campaign will be launched with a "Meat-Free Mondays" program by partnering with local restaurants to encourage plant-based options; based on locally-produced and/or seasonal foods, as possible.

EQUITY CONSIDERATIONS
- Ensure outreach campaigns and materials are available in multiple languages and are culturally appropriate.

FA2. CREATE A FOOD ADVISORY COUNCIL.

ACTION TYPE
Partnership
ACTION SOURCE
New Action

PRIMARY BENEFIT
Environmental Quality

CO-BENEFITS
Stewardship, Education, Resource Consumption, Emissions Reduction, Adaptation

The City will bring a diverse group of food stakeholders together to work towards common goals and shape food policy for the region. Stakeholders will include farmers, advocates, nonprofits, restaurants, chefs, public health experts and community members.

This council should guide the development of a comprehensive food and urban agriculture plan for the city, and subsequent policy related to local food systems, food security and food access.

EQUITY CONSIDERATIONS
- Food access is a key issue to be addressed by this council so at least one council member should be able to speak on behalf of vulnerable communities.

BUILD ORGANIZATIONAL CAPACITY AND PARTNERSHIPS AROUND AN URBAN AGRICULTURE NETWORK

FA3. DEVELOP A DALLAS COMPREHENSIVE FOOD AND URBAN AGRICULTURE PLAN.

ACTION TYPE
Plan; Assessment
ACTION SOURCE
New Action

PRIMARY BENEFIT
Environmental Quality

CO-BENEFITS
Water Quality, Employment, Education, Public health, Resource consumption

The City will comprehensively assess baseline conditions and identify opportunities and strategies to enhance regional food systems. Following the assessment, the City will develop programs and policies to build on the CECAP actions related to food security, food access, and strengthening the local food economy. As part of the plan the City will:

- Perform a comprehensive review of policy and regulatory barriers to growing local food for personal consumption or economic development and plan to remove barriers.
- Evaluate demographic and community specific needs.
- Work with the Food Advisory Council that represents stakeholders from across the food system.
- Identify incentives to support agriculture that provides carbon sequestration benefits.

EQUITY CONSIDERATIONS
- Policies developed within the plan will focus on improving food access for under-served neighborhoods.

FA4. FACILITATE PARTNERSHIPS BETWEEN SCHOOLS + NONPROFITS TO DEVELOP NEIGHBORHOOD-BASED GROWING INITIATIVES + KITCHEN GARDENS IN NEIGHBORHOODS WITH LOW FOOD ACCESS.

ACTION TYPE
Partnership
ACTION SOURCE
New Action

PRIMARY BENEFIT
Environmental Justice

CO-BENEFITS
Emissions Reduction, Stewardship, Inequality, Public health, Education

Several neighborhood based growing initiatives already collaborate with churches and social services in Dallas County to share the food they grow with communities in need. The City will expand this initiative in neighborhoods with low food access and create a program to match neighborhood-based growing initiatives with schools and churches; recruit potential partners from food insecure neighborhoods, and work with social services to divert an agreed percentage of produce to families in need.

The City can also identify city owned land to for neighborhood urban agriculture projects, edible gardens and fruit trees and provide small grants through programs such as the Dallas Neighborhood Vitality Grant Program for Dallas residents to participate in the initiation and maintenance of community gardens.

EQUITY CONSIDERATIONS
- The program will be focused on communities with low food access, which in Dallas are primarily low-income communities of color.

IMPROVE FOOD ACCESS IN NEIGHBORHOODS WITH LOW FOOD ACCESS

FA5. SUPPORT NONPROFITS SOLVING FOOD JUSTICE ISSUES IN DALLAS WITH GRANT WRITING AND DEVELOPING CREATIVE FINANCING OPTIONS.

ACTION TYPE
Program
ACTION SOURCE
New Action

PRIMARY BENEFIT
Environmental Justice

CO-BENEFITS
Employment, Education, Public Health

The City will provide technical assistance with grant writing, and informational resources on funding opportunities and other creative financing options to nonprofits who are working on initiatives related to food security, child or senior hunger, or other food justice issues.

EQUITY CONSIDERATIONS

- Programs supporting food justice will specifically benefit vulnerable communities.

FA6. PARTNER WITH TRANSPORTATION ORGANIZATIONS TO IDENTIFY CREATIVE TRANSPORTATION SOLUTIONS TO ACCESS HEALTHY FOOD RETAILERS IN NEIGHBORHOODS WITH LOW FOOD ACCESS.

ACTION TYPE
Partnership
ACTION SOURCE
New Action

PRIMARY BENEFIT
Environmental Justice

CO-BENEFITS
Public Health, Cost Savings

The City will work with organizations including DART and TNCs to identify creative transportation solutions for communities in neighborhoods with low food access to get to food retailers with healthy food options. This may include on-demand shuttle services to retailers with healthy food options.

EQUITY CONSIDERATIONS

- The shuttle services will support vulnerable communities to help address their lack of access to healthy food.

IMPROVE FOOD ACCESS IN NEIGHBORHOODS WITH LOW FOOD ACCESS

FA7. PARTNER WITH SUPERMARKETS, FOOD RETAILERS AND OTHER SUPPORTING ORGANIZATIONS TO BRING MOBILE GROCERY STORES TO NEIGHBORHOODS WITH LOW FOOD ACCESS.

ACTION TYPE
Partnership
ACTION SOURCE
New Action

PRIMARY BENEFIT
Environmental Justice

CO-BENEFITS
Public Health, Cost Savings, Adaptation, Inequality

To overcome the financial barriers that grocery retailers face in setting up new stores in lower income neighborhoods, the City will partner with them to bring mobile stores to communities with low food access. The City will support retailers with suggested locations, routes, and other barriers they may face to initiate this program. Kroger (one of the largest supermarket chains in North Texas) has already implemented a similar program in Louisville, KY and Milwaukee, WI.

EQUITY CONSIDERATIONS

- The mobile grocery will specifically provide services to vulnerable communities to address their food inequities.

FA8. SUPPORT THE CREATION OF FOOD RELATED GREEN JOBS IN PRODUCTION, PROCESSING, STORAGE, DISTRIBUTION AND WASTE MANAGEMENT.

ACTION TYPE
Assessment
ACTION SOURCE
New Action

PRIMARY BENEFIT
Environmental Justice

CO-BENEFITS
Emissions Reduction, Employment, Education, Resource consumption, Inequality

In the first phase, the City will assess the economic impacts of local food related businesses to inform broader economic development strategies. In the second phase, the City will build partnerships to provide workforce training and development and connect trainees with employers. In addition, opportunities for food incubators, or a food hub for the assembly, storage, and distribution of food from local farms and the processing and development of local food products will be considered.

EQUITY CONSIDERATIONS

- Where possible/appropriate, the workforce training and development will focus on recruiting participants from areas of under-employment.

REDUCE FOOD MILES BY ENCOURAGING LOCAL FOOD PRODUCTION AND CONSUMPTION.

FA9. ESTABLISH A LOCAL FOOD PROCUREMENT PLAN TO ENCOURAGE LOCAL FOOD PURCHASING AT CITY-SPONSORED EVENTS.

ACTION TYPE
Plan

ACTION SOURCE
New Action

PRIMARY BENEFIT
Environmental Quality

CO-BENEFITS
Employment, Public Health, Adaptation

The City will adopt a food procurement policy that emphasizes healthy and local food and would set geographic and nutritional standards for all City sponsored events.

The City can lead, and work with others to influence food procurement to improve community health benefits and strengthen the markets for local producers.

FA10. ENHANCE THE MARKET BY PROVIDING INCENTIVES TO SELL LOCALLY PRODUCED FOOD AT AFFORDABLE PRICES.

ACTION TYPE
Incentive; Partnership

ACTION SOURCE
New Action

PRIMARY BENEFIT
Environmental Quality

CO-BENEFITS
Employment, Public Health, Cost Saving, Inequality

The City will identify opportunities to support the regional food system by incentivizing the production, sale, and consumption of local produce. Strategies may include:

- Identifying regulatory and financial barriers for farmers markets and small pop-up markets, and supporting their expansion across the city.
- Incentivizing the sale of locally produced goods for vulnerable communities by supplementing SNAP programs using federal or philanthropic funding. An example might include matching funds to purchase SNAP-eligible food items in farmers markets. Similar programs have been implemented in Michigan, Washington and Kansas.
- Encouraging large employers to partner with community supported agriculture programs (CSAs) to sign up, coordinate deliveries, and enable employees to receive regular fresh produce. As a pilot, the City can launch an internal 'wellness challenge' with its own employees.

EQUITY CONSIDERATIONS

- Local produce is often more expensive than large supermarket chains. The programs and subsidies will supplement access to healthy food by working with existing SNAP and WIC programs.

PREPARE THE FOOD SYSTEM TO BE MORE RESILIENT TO EXTREME WEATHER EVENTS

FA11. INCREASE FOOD SECURITY BY SUPPORTING STAKEHOLDERS IN THE FOOD SYSTEMS FOOD SUPPLY CHAIN WITH TOOLS TO PLAN FOR CHANGING WEATHER AND EXTREME EVENTS.

ACTION TYPE
Educational

ACTION SOURCE
New Action

PRIMARY BENEFIT
Adaptation

CO-BENEFITS
Education, Cost saving, Public health

The City will partner with stakeholders engaged in food production and distribution to identify strategies to prepare for disruptions from extreme weather events. In addition, the City will initiate an education program to encourage residents to store necessary food supplies in case of an emergency. On the production side, strategies may include the adoption of revised land management practices.

On the distribution side, the City will partner with food retailers and Texas trade retailers to prepare for disruptions from extreme weather events by having a business continuity plan in place. The City can provide training and sample plans to help stakeholders understand and prepare for climate-related risks.

FA12. IDENTIFY OPPORTUNITIES FOR CONTROLLED-ENVIRONMENT AGRICULTURE TO INCREASE LOCAL FOOD PRODUCTION THAT ARE LESS ENERGY AND WATER INTENSIVE AND PROTECTED FROM CLIMATE EXTREMES.

ACTION TYPE
Educational

ACTION SOURCE
Ongoing Action

PRIMARY BENEFIT
Environmental Quality

CO-BENEFITS
Education, Employment, Adaptation, Resource consumption

The Food Advisory Council (see action FA2), will launch a second food idea innovation challenge on the topic of controlled environments for urban agriculture, which may include hydroponics, aquaculture, vermiculture etc. and encourage industry and academic partners to participate (The current Food Innovation challenge is based on food inequities). The City will identify funding to convene a civic/food hacking event and a pilot innovative food project.

EQUITY CONSIDERATIONS

- Once identified, the winning idea can potentially be piloted in communities with low food access.

PREVENT FOOD WASTE THROUGH FOOD DONATIONS, RECOVERY, DIVERSION AND COMPOSTING.

FA13. COLLABORATE WITH ORGANIZATIONS THAT ARE WORKING TO DIVERT SURPLUS FOOD FROM GROCERY STORES AND MARKETS TO REACH COMMUNITIES IN NEED.

ACTION TYPE
Partnership

ACTION SOURCE
New Action

PRIMARY BENEFIT

Environmental Justice

CO-BENEFITS

Emissions Reduction
Public Health
Inequality
Resource Consumption

The City will partner with organizations to address regulatory, informational, or other barriers that hinder the allocation and diversion of surplus food from food retailers to communities in need. The City will also assist in providing guidance for large-scale food composting for food that cannot be recovered.

EQUITY CONSIDERATIONS

- This action directly benefits vulnerable communities and increases access to food.

FA14. ADOPT A SPECIAL EVENTS ORDINANCE THAT ENCOURAGES PROCUREMENT OF LOCALLY SOURCED FOOD, RECYCLING OF WASTE GENERATED AND COMPOST BINS AT SPECIAL EVENTS.

ACTION TYPE
Mandate

ACTION SOURCE
New Action

PRIMARY BENEFIT

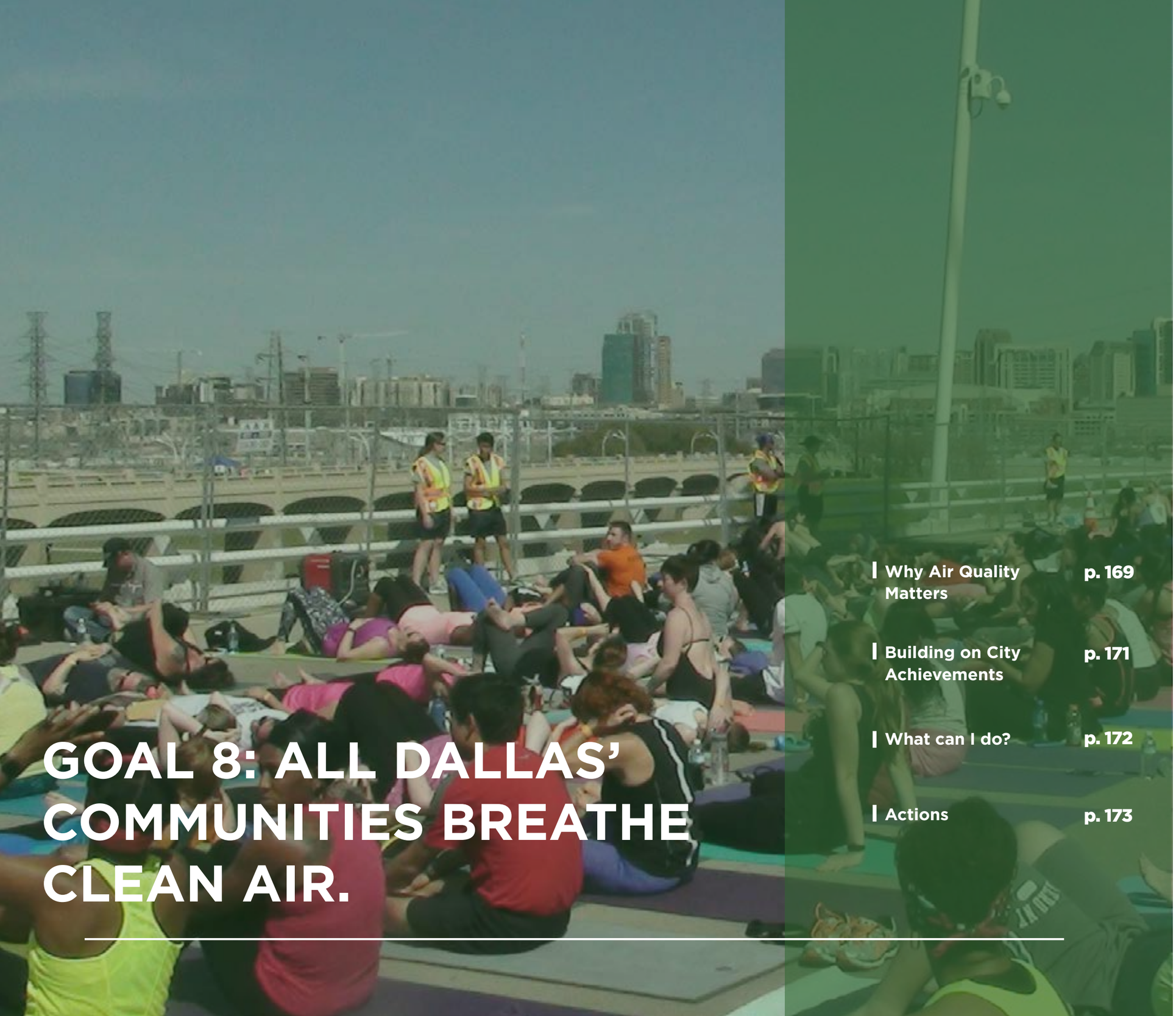
Environmental Quality

CO-BENEFITS

Public health
Stewardship
Education

The City will create and adopt an ordinance for special events that requires multiple waste management options including recycling and organics. The City will provide informational resources to help organizers understand the purpose of the ordinance, and to prepare for their event and will offer a rebate to help event organizers donate surplus food, compost and recycle organics.

COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN



GOAL 8: ALL DALLAS' COMMUNITIES BREATHE CLEAN AIR.

Why Air Quality Matters p. 169

Building on City Achievements p. 171

What can I do? p. 172

Actions p. 173

TARGETS

MEET GROUND LEVEL OZONE ATTAINMENT STANDARD AS DESIGNATED BY NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS) BY 2030 AND MAINTAIN STATUS THROUGH 2050.

MAINTAIN ATTAINMENT STATUS AS DESIGNATED BY NAAQS FOR LEAD, CARBON MONOXIDE, NITROGEN DIOXIDE, PARTICULATE MATTER (PM10), PARTICULATE MATTER (PM2.5) AND SULFUR DIOXIDE THROUGH 2050.

WHY AIR QUALITY MATTERS

While air quality in North Texas is generally improving, in north Texas, ten counties including Dallas consistently do not meet the 2008 Federal air quality criteria for ground-level ozone. In addition, nine counties consistently do not meet the updated 2015 federal standard for ground-level ozone.[40] In 2018, Dallas-Fort Worth was ranked 16th in the American Lung Association's 25 Most Ozone-Polluted Cities. The report estimates 159,749 cases of pediatric asthma, 432,736 cases of adult asthma, 273,449 cases of Chronic Obstructive Pulmonary Disease (COPD) and 4,058 of cardio vascular deceases.[41] In the U.S., black children are twice as likely as white children to have asthma and with greater severity—experiencing higher-than-average rates of hospitalization, emergency room visits and deaths from asthma.[42] **Figures 34 and 35** illustrate the number of pediatric and adult asthma hospitalizations, which are concentrated in the southern and western parts of the city. Increases in temperature exacerbate poor air quality, putting vulnerable population further at risk.

Improvements to air quality can come from several sectors in the CECAP.

Reducing pollutants from fossil fuel powered vehicles is likely to have the most impact on poor air quality in Dallas.

Actions from the ecosystems sector, related to expanding the urban forest or planting more trees can reduce heat, and absorb pollutants, which will also improve air quality, as can actions that remove natural gas from buildings, and actions that move trips to transit, biking and walking, reduce trips altogether and/or use lower carbon fuels. Specific actions to monitor air quality at the neighborhood level, and that prevent the exposure of communities to sources of air pollution, are included in this sector.

Actions that also improve air quality as a co-benefit are listed on p.173-174 but are described in other sector chapters.

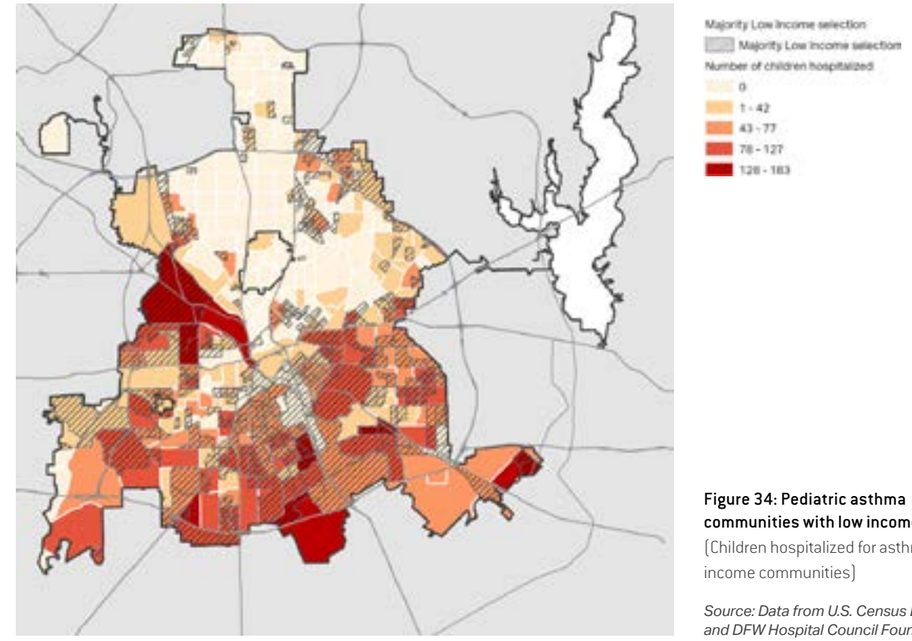


Figure 34: Pediatric asthma in communities with low income
(Children hospitalized for asthma vs low income communities)

Source: Data from U.S. Census Bureau 2018 and DFW Hospital Council Foundation

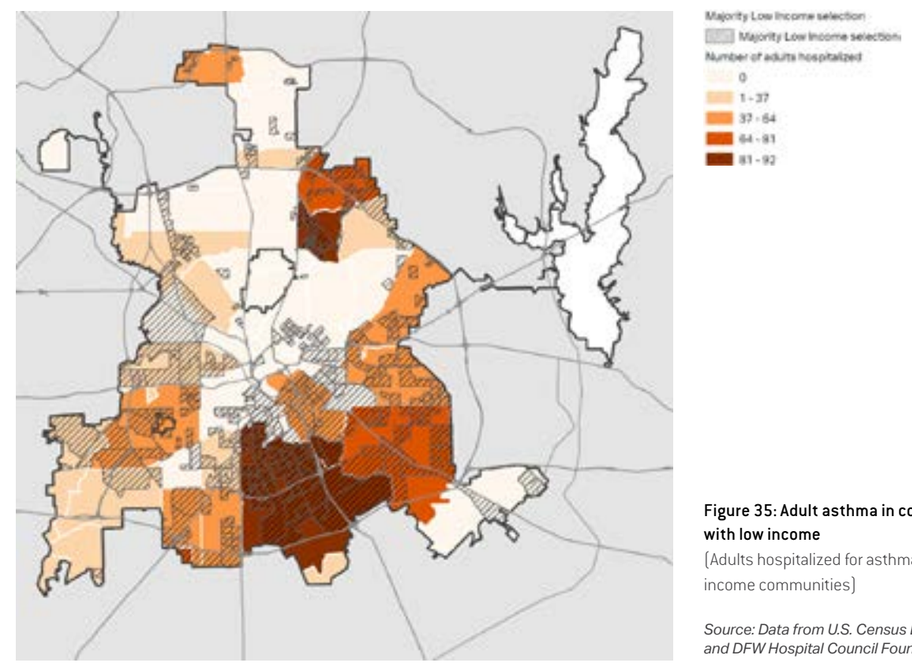


Figure 35: Adult asthma in communities with low income
(Adults hospitalized for asthma vs low income communities)

Source: Data from U.S. Census Bureau 2018 and DFW Hospital Council Foundation

BUILDING ON CITY ACHIEVEMENTS

Breathe Easy Dallas brings together City of Dallas, The Nature Conservancy (TNC), Dallas schools, Texas A&M Transportation Institute (TTI), and public health and other community leaders to improve health, educational, and social outcomes for Dallas children at high risk for asthma-related absenteeism. The project is studying the impact of selected interventions such as reduced vehicle idling, school-based health initiatives, and tree plantings on air quality and asthma-related absenteeism at select schools. In Phase I – nine schools will be monitored to correlate absenteeism with air pollution events and in Phase II –absenteeism will be mitigated using passive and direct intervention.[43]

Air North Texas is a regional public awareness campaign and partnership that seeks to improve air quality in North Texas. The campaign was formed by NCTCOG with support of a task force made up of government agencies, nonprofit organizations, transportation authorities and others. Ten counties in North Texas fall under nonattainment of emissions standards for the pollutant ozone, according to the EPA. North Texas must meet ozone emissions standards as set by the EPA or face federal sanctions. The Air North Texas campaign was created to help alleviate the air quality problem in our region. Air North Texas offers all North Texans, including individuals, businesses and governments, resources related to improving air quality. Clean Air Action Day is the campaign's annual event, during which North Texans are asked to do at least one thing to help improve air quality.[44]

Texas Commission on Environmental Quality (TCEQ) operates an ambient air monitoring network that routinely collects data from stationary monitors around the Dallas- Fort Worth area. The monitors measure compliance with National Ambient Air Quality Standards (NAAQS) for six key pollutants including ozone, lead, carbon monoxide, nitrogen dioxide, particulate matter and sulfur dioxide. Currently there are seven monitors within the City of Dallas. TCEQ is considering increasing the number of monitors to collect more localized and accurate data. [45]

WHAT CAN I DO?

Residents

01 Participate in **Clean Air Action Day** by doing at least one thing to help improve air quality!

02 **Sign up to receive alerts** when air quality is predicted to be in the unhealthy range or higher for sensitive groups in parts of or the entire North Texas nonattainment region.

03 Support the **Engine Off North Texas**. By being aware and reducing your own idling, you're improving your community's air quality while setting a great example for others.

04 Drive less! Consider alternate ways of reaching the places around you instead of driving alone. This can include taking the train or bus, biking, walking, carpooling, working from home among other things.

Businesses

01 Air North Texas is a regional public awareness campaign and partnership that seeks to improve air quality in North Texas. **Become a partner to access to air quality informational materials** and outreach items and be eligible to receive Air North Texas partner awards each fall.

02 Offer rewards and coupons to customers tracking their greener commute trips using the **Try Parking It app**.

03 Offer flexible telecommuting options to reduce office space needed and to reduce commute-related transportation emissions. (See action T5.)

SELECT ANY INITIATIVE TO VISIT THE WEBSITE

SELECT ANY ACTION TO SKIP DIRECTLY TO THAT PAGE

08 | All Dallas' communities breathe clean AIR.

Take a comprehensive approach to addressing air quality at the neighborhood level

- Work with the Texas Commission on Environmental Quality to install additional air quality monitoring stations across the city.
- Partner with nonprofits and schools to develop and implement non- regulatory monitors in neighborhoods.
- Continue to support and expand on the Air North Texas campaign to raise public awareness and improve air quality.
- Ensure new industries are an appropriate distance away from neighborhoods.

Increase energy efficiency of existing buildings or facilities.

- Establish a building efficiency and electrification program (for existing buildings) to replace appliances and systems with electric and other efficient and cost effective options.

Reduce trips where people drive alone.

- Support and expand recommended Transportation Demand Management strategies identified within the Strategic Mobility Plan.
- Work with DART to expand the GoPass platform application as a comprehensive 'Mobility as a Service' (MaaS) provider to unify and streamline connectivity between public and private multi-modal networks.
- Secure resources to implement the existing bicycle network masterplan.
- Evaluate infrastructure to enable City policy on micromobility services to be distributed equitably.
- Increase bus service across the City by adding new routes, shortening headways, and overall increasing service reliability and customer experience.
- Adopt a target corridor, district, or city-wide mode split goals to help reinforce policies aimed at reducing single-occupancy vehicle use.

Synergize jobs and housing with transportation infrastructure to increase access to walking and biking options, and public transit.

- Develop a new comprehensive land use strategy in the upcoming comprehensive plan update to pair with the Strategic Mobility Plan and CECAP goals, adopt policy to reduce transportation related GHG emissions.
- Expand upon the DART Transit Oriented Development (TOD) guidelines to collaborate on a new proactive TOD and housing strategy with DART.
- Work with DART to roll out a sustainable transport "Mobility Hub" infrastructure program.
- Adopt a revised parking ordinance strategy that supports new mode split goals and land use strategy that minimizes available parking in transit-oriented districts.

Operate a clean, green and efficient waste system.

- Improve solid waste, recycling, and brush/bulky waste collection efficiency.
- Explore potential for electric waste collection trucks.

Increase, enhance and maintain healthy forests, parks, and green spaces, that improve air quality.

- Increase tree canopy in both private and public realm to complete implementation of recommendations from the Urban Forest Masterplan.
- Continue ongoing programs to collaborate with community organizations to promote tree planting efforts, protection of trees and prairies, and drought tolerant landscapes.

TAKE A COMPREHENSIVE APPROACH TO ADDRESSING AIR QUALITY AT THE NEIGHBORHOOD LEVEL

AQ1. WORK WITH THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY TO INSTALL ADDITIONAL AIR QUALITY MONITORING STATIONS ACROSS THE CITY.

ACTION TYPE
Program

ACTION SOURCE
New Action

PRIMARY BENEFIT
Environmental Justice

CO-BENEFITS
Air Quality
Public Health

The City of Dallas operates and maintains a number of regulatory air quality monitoring stations in the region on behalf of, and under grants from the TCEQ. Additional monitoring locations may provide data for critical areas on a closer-to-neighborhood basis. Such neighborhood level data could be utilized to track progress for both non-attainment and air quality improvements. It is anticipated several actions and strategic initiatives in the CECAP, and the upcoming Strategic Mobility Plan and Comprehensive Planning efforts will help improve air quality. Through this action the City will work with TCEQ to identify locations for installation of new air quality monitoring stations.

EQUITY CONSIDERATIONS

- Additional air monitoring stations will be prioritized in neighborhoods suffering from the most severe air quality issues and those near major point source emissions.

AQ2. PARTNER WITH NONPROFITS AND SCHOOLS TO DEVELOP AND IMPLEMENT NON-REGULATORY MONITORS IN NEIGHBORHOODS.

ACTION TYPE
Program

ACTION SOURCE
New Action

PRIMARY BENEFIT
Environmental Justice

CO-BENEFITS
Air Quality
Public Health

The City currently operates a small number of air quality monitoring stations in the region on behalf of the TCEQ. This system does not provide detailed data on the neighborhood scale. The City will help create a network of trained volunteers and supportive partners working together to gather information on local air quality. The City will work with nonprofits and schools to install equipment and monitor air quality at the neighborhood level for non-regulatory purposes, and to raise awareness about public health and air quality. Location selection for these air monitors will be conducted in coordination with stakeholders and concerns will be addressed at that time.

This neighborhood level data could be utilized to track progress for air quality improvements based on strategic initiatives deployed in CECAP, the Strategic Mobility Plan and the updated Comprehensive Land Plan.

EQUITY CONSIDERATIONS

- Additional air monitoring stations will be prioritized in neighborhoods suffering from the most severe air quality issues and those near major point source emissions.

TAKE A COMPREHENSIVE APPROACH TO ADDRESSING AIR QUALITY AT THE NEIGHBORHOOD LEVEL

AQ3. CONTINUE TO SUPPORT AND EXPAND ON THE AIR NORTH TEXAS CAMPAIGN TO RAISE PUBLIC AWARENESS AND IMPROVE AIR QUALITY.

ACTION TYPE
Educational

ACTION SOURCE
New Action

PRIMARY BENEFIT
Environmental Quality

CO-BENEFITS
Air Quality
Public Health
Education

Continue to support and expand on the Air North Texas campaign. This is a regional public awareness campaign and partnership that seeks to improve air quality in North Texas to meet ozone emission standards set by the EPA. The campaign was formed by the NCTCOG with support of a task force made up of government agencies, nonprofit organizations, transportation authorities and others.

EQUITY CONSIDERATIONS

- The City will tailor the communication to suit the needs of each community.

AQ4. ENSURE NEW INDUSTRIES ARE AN APPROPRIATE DISTANCE AWAY FROM NEIGHBORHOODS.

ACTION TYPE
Mandate

ACTION SOURCE
New Action

PRIMARY BENEFIT
Environmental Justice

CO-BENEFITS
Air Quality
Public Health

The City will review and potentially amend its zoning standards to separate residential and industrial uses. In addition, it may also consider buffer zones between industrial uses and residential or recreational areas to protect residents from harmful emissions and hazardous industrial activities. The City should evaluate the appropriate buffer distances for air quality and industry types.

EQUITY CONSIDERATIONS

- Protecting neighborhoods most impacted by poor air quality due to industrial uses will benefit vulnerable communities, since industry tends to locate on cheaper land, and therefore is adjacent to lower income communities.

Credit: Timothy Hursley

03 IMPLEMENTATION

03

IMPLEMENTATION + MONITORING

To encourage buy-in and broad participation of the CECAP from businesses and residents, the plan assumes a phased approach to implementation, starting with educational programs or incentives that inspire action and allow time for the community to prepare for significant changes, before moving towards compulsory mandates or ordinances. Using pilot projects that focus on one geographic area, sector, or community may also be used to facilitate a transition to the implementation of actions.

For example, action 'B10 Prepare for the implementation of a benchmarking and disclosure ordinance for commercial buildings' starts with a voluntary pilot program through a 'Better Buildings Challenge' focused on the Central Business District **(See Figure 36 on the following page)**. Participant and stakeholder feedback will help design the specifics of a citywide benchmarking and disclosure ordinance. This approach also enables the City to identify barriers that would compromise the implementation and provides opportunities to address them. Subsequently, in phase I of this action a commercial benchmarking and disclosure ordinance will be adopted to establish a baseline understanding of buildings' energy efficiency. Phase II will include developing a commercial building energy performance ordinance that requires building owners to measure perform energy audits of their buildings. Phase III could include establishing energy use or emission reduction targets. At each phase, based upon participation levels and community support, the City will evaluate how and when the next phase needs to be adopted.

Given the importance of social equity for the plan, a focus will be placed on roll out of actions in neighborhoods where residents are most in need or will most benefit from the action. Additionally, when actions are initiated with pilot programs, the City will focus on under-invested neighborhoods.

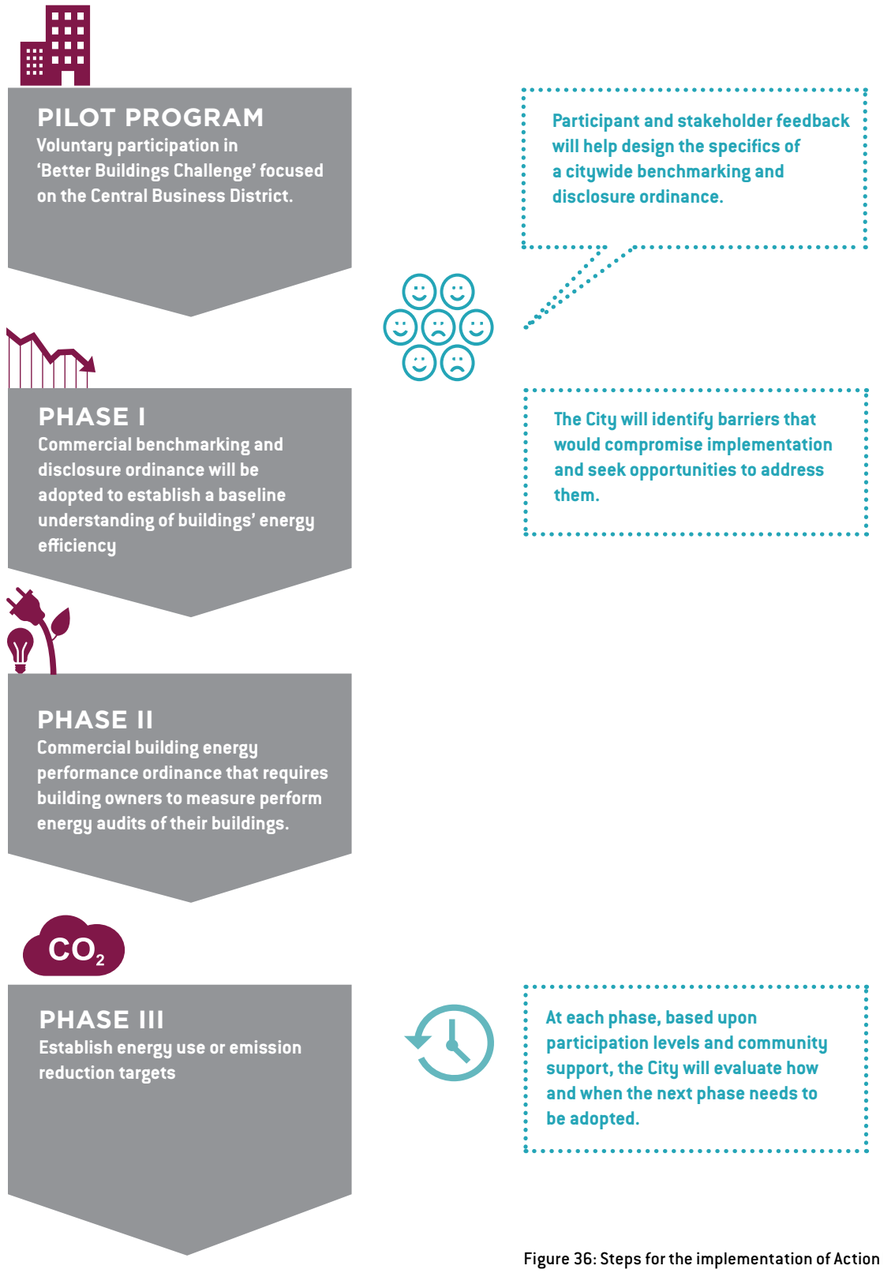


Figure 36: Steps for the implementation of Action B10
Source: AECOM 2020

IMMEDIATE ACTIONS

Table 6 includes actions the City believes form a good initial focus for immediate initiation and implementation. The City of Dallas' Office of Environmental Quality and Sustainability will work with other City departments or appropriate partners to develop immediate implementation plans. 15 actions are already currently underway and will be implemented in the current financial year. Most actions are anticipated to be implemented in the near time frame (0-2 years); all actions will be implemented within the first ten years of the plan with appropriate updates to the plan anticipated at least every three years.

Timeframes are shown in **Appendix B** for each action.

#	Action
SW2	Develop a comprehensive green procurement plan for City operations and establish a sustainable procurement policy.
B11	Update the building code to require wiring conduits for solar photovoltaics and electric vehicle charging infrastructure in new construction.
FA2	Create a Food Advisory Council
FA14	Adopt a special events ordinance that encourages procurement of locally sourced food, recycling of waste generated, and compost bins at special events.
AQ1	Work with the Texas Commission on Environmental Quality to install additional air quality monitoring stations across the city.

Table 6: Immediate actions to be completed this calendar year

IMPLEMENTATION PARTNERS

The City will continue to collaborate with various partners to ensure broad participation, support and accountability during implementation.

Based on the interest from stakeholders, the City will form a new Environment and Sustainability Advisory Committee to assist with implementation, across all sectors and concerned departments.

In addition, the City will continue to work with two additional partners:

City of Dallas Environmental & Sustainability Committee
Mayor Johnson established the Environment and Sustainability (ENVS) Committee with the specific tasks of developing and implementing the CECAP. This Committee, comprising City Council Members representing all areas of the city, has been tasked with ensuring staff accountability towards developing and implementing an equitable, common sense, and data-driven plan. It is anticipated that monthly meetings with the ENVS Committee will be helpful to progress implementation.

Figure 37: Stakeholder Advisory Committee, April 2019
Source: AECOM 2020

Regional Climate Coalition
The City is working with other area cities to form a regional climate council to collaborate on actions, share knowledge, and undertake joint initiatives, such as non-regulatory air quality monitoring efforts. Acknowledging that environmental and climate challenges are regional and watershed-wide, this regional climate group can provide opportunities to identify and address shared vulnerabilities and assist smaller municipalities in overcoming barriers to prepare and undertake such an effort. The City will work closely with other cities, and with support from organizations such as NCTCOG, will build upon their efforts in regional transportation and sustainability to undertake a regional GHG inventory, and a follow-on regional comprehensive climate assessment to understand sector-specific vulnerabilities for future scenarios aligned with CECAP interim years (2030, 2040, and 2050). This assessment will incorporate several studies already undertaken, focus on climate resilience and supplement the Resilient Dallas strategy, which focused on social resilience.

CONSUMPTION BASED INVENTORY

As appropriate, the City may complement the conventional GHG inventory with a consumption-based inventory to assess life cycle carbon emissions. A consumption-based inventory provides a more complete assessment of the community's contributions to global emissions and can help to identify additional local actions that would contribute to mitigating global emissions.

Based on the consumption inventory results, the City can develop additional actions that address significant emissions sources not represented in the City's conventional GHG inventory, such as food production and an education campaign targeted at residents, which could include signposting some of the existing on-line carbon calculators available for individuals.

CECAP EVALUATION AND UPDATES

The City will track and publicly report on the implementation of the actions, emission reductions targets, and action metrics on dallasclimateaction.com. Draft metrics (provided in **Appendix B**) will be finalized and used to track progress of each action. Monitoring and reporting intervals will be dependent on the data collection process required for each metric. Climate action planning is a cyclical and iterative process **(Figure 38).** The City of Dallas Office of Environmental Quality and Sustainability will work with other City departments to track and publish annual progress reports summarizing CECAP progress. The GHG inventory will be updated every 3 years and will be a key indicator of the success of the Plan. The next inventory will be initiated in January 2021 using data from calendar year 2020, and following in 2024, using 2023 data. These data will be used to review progress towards meeting the GHG emission targets; depending on trend analyses, additional actions may be implemented to improve trending towards the goals of the Paris Agreement.

Figure 38: Climate Action Planning Process
Source: AECOM 2020

The City of Dallas recognizes the importance of the actions included in this CECAP and is dedicated towards timely and effective implementation. We will be relying on the residents, businesses and institutions within the City to work together towards this effort.

FUNDING CONSIDERATIONS FOR IMPLEMENTATION

Fully understanding that there is reticence to take on ambitious plans in a time of market uncertainty, CECAP implementation has been determined to allow a sustainable implementation strategy, utilizing efforts under existing budgets, and maximizing external grants, loans, and partnerships, to the degree practicable to minimize the need for additional general funds. Additionally, there are several tasks within the plan that focus on identifying funding, partnering, and teaming arrangements that can be used by both public and private entities to implement the actions in this plan. Identified funding mechanisms that are anticipated to be available for plan implementation include but are not limited to:

Carryout Bag Fund
The CECAP was developed using funds collected during the short-lived single-use plastic carryout ban. These funds are limited to environmental outreach, administrative costs related to the ban, and environmental actions. There is about $500k left in this fund that may be helpful towards developing a city-wide energy strategy, implementing the FY 20-21 GHG Inventory, and towards the administrative effort for implementing this plan (outreach, developing online dashboards to track progress, community and council coordination, etc.).

Reforestation Fund
The recently enacted Tree Ordinance includes a penalty for removing healthy native trees, intended as a deterrent to removing trees; however, many simply paid into the fund, resulting in fewer trees, and a heathy, but largely unencumbered fund for tree replacement. These funds are limited to procuring trees for public property only and do not include tree maintenance nor water and irrigation. The fund has accumulated several million dollars and has had little usage under the original intent. It is anticipated that these funds may be available to use to implement recommendations of the Urban Forest Master Plan.

Green Energy Policy Implementation and Contract
The City's recent green energy policy includes requirements for an Energy Management System to identify City buildings where energy efficiency retrofits may be helpful, and to develop a program for implementation. The subsequent Green Energy contract includes resources to allow investigation of on- and off-site renewable energy generation. It is anticipated that implementing energy efficiency retrofits should allow programmatic savings that may be used to implement energy generation. These measures are anticipated to be implemented in the medium (2- 6 year) timeframe.

VW Settlement Funds
The TCEQ has been charged with distribution of funding from the Volkswagen Emissions Settlement. These funds may be used for equipment conversion from high to lower emission, electric vehicles, and charging equipment. OEQS has been working with the North Central Texas Council of Governments, the Equipment & Fleet Department, the Office of Strategic Partnerships & Public Affairs to apply for funding under this program to support Dallas City fleet conversion, and potential public-facing EV charging infrastructure.

Texas Emissions Reduction Plan (TERP)
The TCEQ also has several grant opportunities for vehicle replacement, EV charging and other emission reduction technologies. The Notice of Funding Availability is generally quarterly. OEQS has been working with the North Central Texas Council of Governments,

the Equipment & Fleet Department, the Office of Strategic Partnerships & Public Affairs to apply for funding under this program to support Dallas City fleet conversion, and potential public-facing EV charging infrastructure.

Existing Partnerships
The City has several ongoing partnerships with great non-governmental organizations such as the Trust for Public Land, The Nature Conservancy, the Communities Foundation of Texas, The Texas Trees Foundation, Earthx and many others, and value these partnerships as an important way of meeting joint public-private goals towards improved quality of life in Dallas. We anticipate continuing our efforts with these organizations.

New Partnerships
We welcome the opportunity to develop new partnerships to implement the actions within this plan and are actively working towards several commercial public-private partnerships relative to the waste and energy sectors. The City of Dallas was recently selected by three international climate partners, C40, Carbon Disclosure Project, and the World Business Council for Sustainable Development (WBCSD), as one of three cities to be part of the first cohort of the City-Business Climate Alliance (CBCA) cities. This Alliance includes receiving direct support to build or develop a local city-business partnership on climate, as well as joining the CBCA Global Network for scaled-up action and advocacy opportunities.

Grants and Loans
Several City programs, including our Air Quality Program are currently funded under grants from the TCEQ, and other state and federal agencies. The Office of Strategic Partnerships and Government Affairs does a great job of researching and actively applying for grants and loans to support these City programs. Once project specific costs are identified, we anticipate that grants and loans may be explored as funding options for future actions that may require additional funding.

Forest Carbon Sequestration Credits
The City is exploring the potential to establish a City Urban Forest Carbon Sequestration program, similar to programs in Austin and Portland. The program quantifies the amount of carbon sequestered through urban trees. These credits may be used as a potential way to fund CECAP implementation; additionally, Carbon credit programs require measures to maintain, preserve and protect the urban canopy in areas subject to the carbon credit program, and so can serve to help ensure appropriate care of this important natural resource.

Green Bonds
Many communities develop "green bond programs", similar to current bond programs for facilities and infrastructure to help finance energy-related building efficiency upgrades, and or renewable energy generation.

Federal & State Legislation
Energy efficiency, renewable power generation, storage and distribution, and financial incentives to support communities trying to reduce emissions, and heat island impacts would be an important part of our legislative agenda. Particularly, increasing state renewable incentives to commercial and homeowners would be helpful towards plan implementation.

Environmental Fees
Very last, for obvious equity and other reasons, as necessary, it may be necessary to investigate implementing environmental fees, similar to those levied for stormwater compliance, solid waste management, drainage infrastructure,

and water utilities, with the funding earmarked for implementing measures within the CECAP. This would be well into the plan, after all other viable funding options are exhausted.

It should be noted that there are also several national and international funding opportunities available solely to cities with formally adopted climate plans. Climate planning, particularly plans like the CECAP that encompass the Paris Climate Agreement and the United Nations Sustainability Goals, is also encouraged by monetary organizations such as the Federal Reserve Bank, and Moody's Bond Rating Service as an indicator of a city that has identified the risks associated with climate change and that is moving proactively to appropriately manage that risk.

Credit: 350Dallas

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GLOSSARY

Carbon Neutral - Refers to achieving net zero carbon emissions by either balancing carbon emissions with carbon removal or simply eliminating sources of carbon emissions.
Equity - Equity is about fairness, which is about ensuring that people have access to the same opportunities and have what they need to thrive and succeed.
Equality - Equality is about sameness, meaning that everyone receives the same thing regardless of any other factors.
Fugitive emissions - Unintentional emissions arising from facilities or industry activities. The EPA distinguishes fugitive emissions by separating them from the type of emissions that would usually be vented through a chimney, vent or other opening. Fugitive emissions may also occur as a result of leaks from pressurized equipment.
Greenhouse Gas (GHG) Emissions - Gases that trap heat in the atmosphere.
Scope 1 emissions - GHG emissions from sources located within the city boundary; generally includes in-boundary water and wastewater generation, waste management, transportation, stationary fuel combustion, and agriculture, forestry and other land uses.
Scope 2 emissions - GHG emissions occurring through grid-supplied electricity, heat, steam and/or cooling within the city boundary.
Scope 3 emissions - All other indirect sources of GHG emissions that occur outside the city boundary as a result of activities taking place within the city boundary; generally includes out-of-boundary transportation, water and wastewater generation, power generation and distribution, and other emissions. These are all indirect emissions (not included in scope 2).
Stationary energy - Energy utilized by residential buildings, commercial and institutional buildings and facilities, manufacturing industries and construction, energy industries, agriculture, forestry, and fishing activities, non-specified sources, fugitive emissions from mining, processing, storage, and transportation of coal and fugitive emissions from oil and natural gas systems.
Net Zero - Achieved when the amount of $C0_2$ emissions released on an annual basis is zero, or negative.
Net Zero carbon building - A highly efficient building that is fully powered from on-site and/or off-site renewable energy sources and offsets.
Non-potable - Non-potable water is water that is not of drinking quality, but may still be used for many other purposes, depending on its quality.

APPENDIX A: LIST OF STAKEHOLDERS

Advocacy and Community
Public Citizen
Dallas Environmental Justice Network
Builders of Hope
Joppa Freedman's Town Association
West Dallas One
Texas Campaign for the Environment
350 Dallas
Dallas Sierra Club
Faith in Texas
Grow North Texas
Climate Reality Project
Green Careers Dallas

Academia
University of Texas- Arlington
Paul Quinn College
Dallas County Community College District

Business
EarthX
Container Store
Apartment Association of Greater Dallas
Options Real Estate
Lyda Hill Philanthropies
Oncor
Federal Reserve Bank of Dallas
AT&T
Dallas Regional Chamber
Black Chamber of Commerce
Hispanic Chamber of Commerce
American Airlines
Southwest Airlines
Toyota Motors North America
Hunt Consolidated, Inc.
JPMorgan Chase
U.S. Green Building Council Texas
GGO Architects
RE:source
The Real Estate Council
Dallas Builders Association
Atmos Gas

Government
City of Dallas
North Central Texas Council of Governments
Dallas Area Rapid Transit

Public Health
Asthma Chasers
Baylor Scott and White
Parkland Hospital
Texas Trees Foundation
The Nature Conservancy
Trust for Public Land

APPENDIX B: IMPLEMENTATION TABLES

The tables in this appendix identify the draft time horizon for each action. The City has identified the actions for immediate implementation and will then develop a schedule for implementing the other short-term actions.

Horizons considered include – Immediate, Short (1-2 years), Medium (2-6 years). The City will need to evaluate the actions holistically to align with targets, and departmental capacity.

The tables also outline some draft metrics that could be used to track progress. Two kinds of metrics are included: output metrics which are measurable indicators directly related to action implementation, (e.g. miles of bike lanes installed), and outcome metrics which measure the broader impacts that the action will lead to (e.g. increase in bicycle mode share).

COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN

#	Action	Horizon	Potential Output Metrics	Potential Outcome Metrics
Goal 1: Dallas' buildings are energy-efficient and climate resilient.				
B1	Demonstrate leadership in developing a carbon neutrality plan for municipal operations.	Short	• # of energy audits performed on municipal buildings/facilities • kWp of renewable energy systems installed	• Estimated energy savings (kWh, therms) from implementing audit results • Non-renewable energy use in municipal buildings
B2	Achieve Level 3+ Airport Carbon Accreditation at Love Field for carbon neutral operations and maintain accreditation for DFW, and pursue for Dallas Executive Airport	Immediate	• Total Scope 3 emissions estimated (MT CO_2e) • # of third-party entities engaged through optimization process to reduce Scope 3 emissions	• Estimated emissions reductions (MT CO_2e) from third-party sources • Total emissions reduced through optimization efforts • Total emissions addressed through offset
B3	Develop clear and comprehensive educational program for building owners and tenants about existing energy efficiency programs.	Short	• # of residents and businesses engaged by the City through the energy resource center • # of participants accessing funding from each source • # of low-income participants accessing funding from each source	• Estimated energy savings (kWh, therms) from use of financial incentive programs • Energy use in existing buildings
B4	Implement a citywide building weatherization program through partnership with community organizations.	Short	• # of residents engaged by the City through weatherization program • # of low-income residents engaged by the City through weatherization program	• Estimated energy savings (kWh, therms) from program participation • Energy usage in existing residential buildings
B5	Identify new financing mechanisms to accelerate energy efficiency improvements in existing buildings.	Short	• # of residents and businesses engaged by the City through the energy resource center • # of participants accessing funding from each source • # of low-income participants accessing funding from each source	• Estimated energy savings (kWh, therms) from use of financial incentive programs • Energy use in existing buildings
B6	Establish a building efficiency and electrification program (for existing buildings) to replace appliances and systems with electric and other efficient and cost effective options.	Medium	• # of residents and businesses engaged by the City through the energy resource center • # of low-income residents and small businesses engaged by the City through the energy resource center	• # of electric HVAC systems installed
B7	Increase participation and scope of the Dallas Green Business Certification program.	Immediate	• # of certified Green Businesses	• Energy use in existing commercial buildings • Estimated energy savings (kWh, therms) from program certification requirements
B8	Implement a Better Buildings Challenge that expands the 2030 District goals beyond Downtown Dallas.	Short	• Building area (sq ft) of participants in Better Buildings Challenge	• Estimated energy savings (kWh, therms) from participants' goals • Energy use in existing buildings
B9	Establish a point-of-sale/point-of-lease home energy rating and disclosure educational program for single-family buildings.	Medium	• # of homes retrofitted each year • # of low-income homes retrofitted each year • Compliance with ordinance	• Estimated home energy savings (kWh, therms) from voluntary improvements • Energy use in existing buildings
B10	Prepare for the implementation of a benchmarking and disclosure ordinance for commercial buildings.	Short	• Total building area (sq ft) covered by the benchmarking program • % compliance with the benchmarking program	• Energy use in existing commercial buildings

COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN

#	Action	Horizon	Potential Output Metrics	Potential Outcome Metrics
B11	Update the building code to require wiring conduit for solar photovoltaics and electric vehicle charging infrastructure in new construction.	Immediate	• # of solar ready homes constructed • # of low income solar ready homes constructed	• Energy use in residential buildings • # of residential solar permits issued
B12	Evaluate and consider a Zero Net Energy (ZNE) code for all new buildings and substantial renovations by 2030.	Medium	• # of Zero Net Energy buildings constructed • # of low income Zero Net Energy developments constructed • Estimated avoided energy consumption (kWh, therms)	• Energy use in buildings
B13	Establish urban greening factor requirements for new developments that quantify how projects contribute to urban greening for reduced stormwater runoff and urban heat island improvements.	Medium	• # of new residential projects developed that achieve urban greening factor requirements • # of new low-income residential projects developed that achieve urban greening factor requirements • # of new commercial projects developed that achieve urban greening factor requirements	• Urban heat island index • # of flooding events in areas of new development
B14	Promote passive building design (e.g., orientation, shading devices) through the City's zoning ordinance and design standards	Short	• # of buildings constructed with passive design features • # of low-income homes constructed with passive design features	• Energy use in new buildings
B15	Evaluate potential city- owned properties for the creation of 'resilience hubs'.	Medium	• # of resilience hubs constructed • # of resilience hubs constructed or renovated in vulnerable communities.	• Provision of emergency services during storm events • Access to safe spaces during storm events for vulnerable communities
B16	Encourage building owners to submeter their buildings to support increased energy conservation.	Short	• Quantity of property owners reached	• Quantity of submeters installed (self-reported) • Energy use in existing buildings
Goal 2: Dallas generates and uses renewable, reliable and affordable energy.				
E1	Maintain a high degree of reliability in the electric delivery grid through cooperative actions between the City and Oncor.	Short	• # of tree cuttings to reduce risk to power lines • # of facilities with back-up power through storage batteries • # of facilities with back-up power through storage batteries in vulnerable communities	• # of customers suffering power outage caused by storm events annually
E2	Evaluate the potential for the City to make investments in energy storage technologies for both resilience and renewable energy development purposes	Short	• Total energy storage capacity • # of resilience hubs developed • # of resilience hubs developed in vulnerable communities • # of projects realized through partnerships • # of projects realized through partnerships in vulnerable communities	• # of people served during emergencies
E3	Continue partnership with Oncor and other Public Utility Companies on an intensive education program on renewable energy options	Immediate	• # of people reached through education campaign • kWp of renewable energy systems installed	• kWh renewable electricity generated • # of people signed up to a green electricity tariff (if available)

COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN

#	Action	Horizon	Potential Output Metrics	Potential Outcome Metrics
E4	Invest in programs through local community colleges to train and establish a local workforce that is focused on renewable energy technologies.	Medium	• # of students graduating in sustainable construction ore energy courses	• Increased installation of solar panels and energy conservation measures by local contractors
E5	Build a regional strategic partnership to promote adoption of renewable energy.	Medium	• Appointment of technical advisory committee • # of partnerships • kWp of renewable energy systems installed	• kWh renewable electricity generated
E6	Establish and invest in renewable energy hubs through partnerships with the private sector	Medium	• # of projects following first demonstration project • kWp of renewable energy systems installed	• kWh renewable electricity generated
E7	Extend City efforts to develop more renewable energy projects on City facilities.	Short	• kWp of renewable energy installed by City	• kWh renewable electricity generated
E8	Continue to implement Green Energy policy for City facilities.	Immediate	• kWh of renewable energy installed by City • # Partnerships with off-site projects	• kWh renewable electricity generated
E9	Extend partnership with Oncor, PACE, and other Public Utility Companies to provide further incentives for renewable energy.	Short	• # of projects approved under the program • kWp of renewable energy systems installed	• kWh renewable electricity generated • # of people signed up to a green electricity tariff (if available)
E10	Advocate for renewable energy policies at the state and federal levels.	Short	• Texas Mayors advocate the State Legislature	• State Legislature increases the Texas Renewable Portfolio Standard to 80% zero carbon electricity by 2050.
E11	Educate commercial power users about power savings associated with demand side management.	Short	• Commercial properties reached	• kW reduced during summer peak period • Financial energy savings by participating commercial properties • Financial incentives earned by service providers
Goal 3: Dallas' communities have access to carbon-free, affordable, transportation options.				
T1	Work with City of Dallas, DISD, and DART to transition the bus fleet to a 100% electric by 2040.	Medium	• % of vehicle fleet/bus fleet that is electrified	• Improvement in local air quality
T2	Work with private and public intrastate transport operators to expand transit services between major super commuting cities.	Short	• # of super commuting services offered • # incentive packages offered	• Super Commuting services annual ridership
T3	Create an incentives/fee program in which shared mobility services (Lyft, Uber, etc.) can increase their fleet size and operating footprint if their fleets are increasingly electrified.	Short	• # of EV registered in Dallas • % of Transportation Network Company trips provided by Electric Vehicles	• Take up of incentive program
T4	Put in place a comprehensive incentives package to help accelerate Electric Vehicle (EV) use	Short	• # of EV charging stations • # of EV charging stations in vulnerable communities	• # of EV registered in Dallas

COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN

#	Action	Horizon	Potential Output Metrics	Potential Outcome Metrics
T5	Support and expand recommended Travel Demand Management strategies identified within the Strategic Mobility Plan.	Short	• # of companies with enhanced communications around Transportation Demand Management strategies	• Commute Time: Ratio between the average time spent commuting one way to work (in minutes) for Hispanic and White adults aged 25-64 • Decrease in Single Occupancy Vehicles
T6	Support the development of a platform for a comprehensive 'Mobility as a Service' (MaaS) provider (i.e. Whim, Uber) to unify and streamline connectivity between multi-modal networks, including DART bus and rail service.	Short	• Development of a Mobility as a Service (MaaS) system in Dallas	• # of users on Mobility as a Service (MaaS) system • Decrease in Single Occupancy Vehicles (SOV) • Commute Time: Ratio between the average time spent commuting one way to work (in minutes) for Hispanic and White adults aged 25-64
T7	Secure resources to implement the existing bicycle network masterplan.	Short	• Individual hired to implement the Bicycle Masterplan (Y/N) • # of miles of bike lanes installed • % of bicycle facility network completed • # of identified projects implemented • # of end-of-trip facilities installed	• Bicycle mode share % • # of reported bicycle crashes per total number of bicyclists counted and annual traffic volumes
T8	Evaluate infrastructure to enable City policy on micro mobility services to be distributed equitably	Short	• # of micro-mobility assets in underserved neighborhoods • Infrastructure improvement projects in underserved neighborhoods	• Miles traveled by passengers who originate in specific neighborhoods • Trips generated by passengers in specific neighborhoods
T9	Increase bus service across the City by adding new routes, shortening headways, and overall increasing service reliability and customer experience.	Medium	• Bus system ridership • Bus ridership increase for transit dependent communities. • Transit Frequency: Ratio between the average number of public transit trips available to majority-Hispanic and majority-Black neighborhoods on Monday between 4:30 a.m. and midnight	• Transit ridership mode split • Commute Time: Ratio between the average time spent commuting one way to work (in minutes) for Hispanic and White adults aged 25-64
T10	Adopt a target corridor, district, or city-wide mode split goals to help reinforce policies aimed at reducing single-occupancy vehicle use	Short	• % carpool, public or active transportation	• % Single Occupied Vehicles (SOV) per Corridor • Average Vehicle Miles Traveled (VMT) per Capita • Modal split percentages
T11	Develop a new comprehensive land use strategy in the upcoming comprehensive plan update to pair with the Strategic Mobility Plan and CECAP goals, adopt policy to reduce transportation related GHG emissions	Short	• Comprehensive Plan is adopted	• Transit Oriented Development (TOD), both bus and rail, is more widespread in Dallas. • Transit Frequency: Ratio between the average number of public transit trips available to majority-Hispanic and majority-Black neighborhoods on Monday between 4:30 a.m. and midnight
T12	Expand upon the DART Transit Oriented Development guidelines to collaborate on a new proactive TOD and housing strategy with DART	Short	• Comprehensive Transit Oriented Development (TOD) and housing strategy adopted	• # of Transit Oriented Developments (TOD) developed • # of mixed income housing units
T13	Work with DART to roll out a sustainable transport 'Mobility Hub' infrastructure program	Medium	• # of mobility hubs constructed • # of mobility hubs constructed in underserved communities	• % mode splits for transit, bicycling and walking increasing

COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN

#	Action	Horizon	Potential Output Metrics	Potential Outcome Metrics
T14	Adopt a revised parking ordinance strategy that supports new mode split goals and land use strategy that minimizes available parking in transit-oriented districts.	Medium	• Revised parking strategy or ordinance adopted • sqft of permeable parking spaces installed	• Decrease in number of new parking spaces in the city • Increase in transit ridership
T15	Implement green infrastructure programs that sets specify design and performance standards that treat the Right of way (ROW) as both a mobility and green infrastructure asset	Short	• Miles of new green mobility infrastructure installed	• Increase in # of bicycle and pedestrian trips • Reduction in # of flooding events
T16	Convert all traffic lights and streetlights to LEDs	Short	• % of streetlights retrofitted • % of traffic lights retrofitted	• Estimated energy savings (kWh) from implementation • Energy use in municipal facilities
T17	Work with DART to improve bus station shelter amenities that reduce the impact of weather on rider comfort and usability	Medium	• Miles of roadway improved • # of trees in planted in right-of-way • # shelters modified	• # of transit riders (tickets/passes sold)
T18	Develop and implement the Climate Change and Extreme Weather Vulnerability and Risk Assessment for Transportation Infrastructure.	Medium	• Assessment of follow up actions has been completed	• Reduction in exposure of assets to climate stressors
T19	Encourage businesses, commercial entities and institutions to electrify fleet, including, but not limited to local and regional delivery trucks and other heavier vehicles	Short	• Quantity of local business reached • Quantity of outreach events	• Quantity of EVs purchased
Goal 4: Dallas is a zero-waste community.				
SW1	Actively promote source reduction, recycling and composting to the Dallas community.	Short	• # of information campaigns • # of people reached through campaigns (media impressions, bill inserts circulated, ad campaigns initiated etc.)	• Tons of waste generated per capita • Tons recycled • % of contamination in recycled materials taken to material recovery facilities • # of new recycling markets attracted to the city • Employment in the recycling industry in Dallas
SW2	Develop a comprehensive green procurement plan for City operations and establish a sustainable procurement policy.	Immediate	• Procurement plan and policy adopted	• Increase in green business certifications • All City departments follow requirements
SW3	Improve solid waste, recycling, and brush/bulky waste collection efficiency.	Medium	• # of miles driven by SAN collection vehicles • Tonnes of brush/bulky waste collected • # of trips reduced in low income communities	• Reduced greenhouse gas emissions, miles, and gas consumption
SW4	Explore potential for electric waste collection trucks.	Medium	• # of vehicles operating using Compressed Natural Gas or electricity as fuel	• Reduced greenhouse gas emissions due to reduced diesel fuel reliance

COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN

#	Action	Horizon	Potential Output Metrics	Potential Outcome Metrics
SW5	Update and implement a Zero Waste Management Plan.	Short	• Adoption of the Plan by City Council • Periodic technical assessments of alternatives for waste management	• Reduced quantities of waste landfilled • Increased recycling and organics diversion. • Reduced greenhouse gas through reductions in landfill quantities • Tons of waste processed in energy recovery facilities
SW6	Expand efforts to reduce illegal dumping by implementing recommendations identified in the Litter and Illegal Dumping Assessment Study (2018).	Short	• Decrease in # of illegal dump sites • Decrease in # of sites reported • Decrease in # of sites reported in vulnerable communities • Tonnes of waste collected	• Elimination of illegal dump sites
SW7	Encourage the development of material markets – focusing on creating new economic opportunities.	Medium		• # of new recycling markets attracted to the city • Increase in recycling rates • Employment in the recycling industry in Dallas • Greenhouse Gas emission reductions brought about through increased recycling and reduced waste disposal • Tons of material kept out of the landfill
SW8	Continue to capture gas and expand capacity from landfill for reuse and evaluate for City operations.	Immediate	• Landfill gas captured • Landfill gas sold	• Greenhouse gas emission reductions
SW9	Adopt an ordinance to implement a city-wide organics management program.	Short	• Tons of compost produced	• Tons of materials not landfilled • Greenhouse gas emission reductions
Goal 5: Dallas protects its water resources and its communities from flooding and drought.				
WR1	Continue investment in public awareness campaigns to increase knowledge of the value of water and importance of conservation.	Immediate	• Dollars invested in partnership communication campaigns • # of enhanced communication campaigns	• Reduction in gallons consumed daily per capita • Water bill savings reported by large consumers
WR2	Continue investment in leak detection and expand programs to reduce overall water loss through the conveyance systems.	Medium		• Reduction in the measurable water loss across the entire system annually. • Reduction in Water demand due to water loss reduction in customer cities
WR3	Evaluate potential opportunities and financial feasibility for reusing water for non-drinking purposes	Medium	• # of feasibility studies completed	• # of locations using water effluent for irrigation • Reduction in potable water used in non-potable applications
WR4	Encourage businesses and residents to plant drought-tolerant and native vegetation or xeriscape to reduce irrigation water use	Short	• Amount of financial assistance provided • Amount of financial assistance provided in low income communities	• # of properties that shift from green lawns to native drought-tolerant landscape

COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN

#	Action	Horizon	Potential Output Metrics	Potential Outcome Metrics
WR5	Continue to monitor and protect water quality and implement improvement projects in of the watershed	Short	• Reduction in average instances in large-scale eutrophication	• Improved operations at Dallas Water Utilities Water Treatment Plants due to improved quality of source water being treated • Increase in recreational usage of water bodies due to improve water quality conditions. • Whiterock Creek is not impaired by bacteria
WR6	Continue to protect and monitor water quality by tracking emerging contaminants that may impact public health.	Short	• Reduction in the concentrations of emerging contaminants	• Achieve regulatory compliance
WR7	Use FEMA Community Rating System to educate and protect communities from flooding.	Immediate	• Community Rating System class designation • # of structures in low vulnerable communities protected	• Improve drainage infrastructure within flood prone areas
WR8	Complete the implementation of major planned and ongoing drainage infrastructure projects to improve community resilience to flooding.	Medium	• Completion of projects within schedule and budget	• Reduction in flood severity and occurrence in flood prone areas
WR9	Initiate a comprehensive Storm Drainage System assessment and planning process	Medium	• Necessary long term 10-year capital improvements list of projects prioritized based on importance	• Reduction in flood severity and occurrence in flood prone areas
WR10	Evaluate policies affecting drainage and erosion to ensure sustainable development and mitigate adverse impacts	Medium	• # of policies identified • # of structures protected from localized flood	• Improvement in water quality
WR11	Continue implementation of the 'Drought Contingency Plan.'	Medium		• Less severe water use restrictions during drought conditions
WR12	Continue contingency planning to protect and maintain service of key water infrastructure facilities from extreme weather events.	Short	• # of upgrades completed	• Prevent disruption of service to customers • Zero unplanned shutdown/interruption of service due to extreme weather events for water, wastewater and storm facilities
WR13	Evaluate new technologies to lower nutrient releases into the Trinity Watershed from wastewater treatment plants and incorporate as appropriate	Medium	• # of new technologies evaluated	• Recoup cost and generate income • Reduce the overall operating cost • Reduce biosolid volume disposal at both plants • Improve wastewater effluent quality at both plants
WR14	Evaluate new or improved operational strategies and technologies to optimize the use of chemicals and reduce energy usage at water and wastewater treatment facilities.	Short	• Reduce use of chemicals and energy	• Lower greenhouse gas foot print • Reduce overall Operation & Management (O&M) cost due to optimization

COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN

#	Action	Horizon	Potential Output Metrics	Potential Outcome Metrics
WR15	Continue investment in sewer collection system to reduce Inflow/ Infiltration (I/I) to improve water quality and reduce energy usage.	Immediate	• Reduce inflow/infiltration (I/I) peak factors during wet weather • Reduce number of wet weather Sanitary Sewer Overflows (SSOs).	• Improve Compliance with TCEQ regarding Sanitary Sewer Overflow (SSOs) • Reduce overall cost of operating wastewater treatment plants by reducing the volume of wastewater flow during wet weather events • Reduce number of wet weather Sanitary Sewer Overflows (SSOs).
Goal 6: Dallas protects and enhances its ecosystems and green spaces that in turn improve public health.				
EG1	Increase and improve access to green spaces particularly within vulnerable communities to reduce impact of urban heat island, localized flooding and improve public health.	Short	• # of new parks • # of pocket parks • #/ area of green roofs, green walls, etc. • Access to Parks: Ratio between the average number of parks in majority-Black and racially diverse neighborhoods.	• Reduction in urban heat island • Increase in number of people within ½ mile walk of a park • Increase in number of people from vulnerable communities within ¼ mile walk of a park
EG2	Assess opportunities for blue-green infrastructure in the public realm to reduce flood risk.	Short	• # of green infrastructure projects identified.	• Reduction in urban heat island • Increase in number of people within ½ mile walk of a park
EG3	Increase tree canopy in both private and public realm to complete implementation of recommendations from the Urban Forest Masterplan	Short	• # of tree saplings given away • # of trees planted • # of trees planted in vulnerable communities	• % increase of canopy cover • Reduction in heat island effect • % canopy increase in vulnerable communities • Carbon sequestrated as a result of tree planting
EG4	Continue ongoing programs to collaborate with community organizations to promote tree planting efforts, protection of trees and prairies, and drought tolerant landscapes	Immediate	• # of tree saplings given away • # of trees planted • # of trees protected • Increase in prairie lands • # of saplings given away, trees planted and protected in vulnerable communities	• % increase of canopy cover • Carbon sequestrated as a result of tree planting • Reduction in heat island effect • Reduction in heat island effect in vulnerable communitiesa
EG5	Update City Park operations and maintenance procedures to include comprehensive ecofriendly and best management practices sustainable practices.	Short	• Updated procedures • # of people trained on the new procedures	
EG6	Partner with local universities, schools and NGOs and launch projects for community members to help inventory urban trees	Short	• # of trees recorded • # of participants	• Updated and complete tree inventory
EG7	Develop a City Forest Carbon Credits program to quantify and monetize sequestered carbon in urban trees	Short	• # of credits sold	• Increase in canopy cover

COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN

#	Action	Horizon	Potential Output Metrics	Potential Outcome Metrics
EG8	Improve the quality of urban ecosystems in Dallas through the sustainable appropriate design, creation and planting of urban habitats.	Short	• # of pollinator gardens • # of bee box/hives • # and length of quality wildlife corridors	• Wildlife diversity- increase in species count
EG9	Support public and private partnerships using nature-based solutions to address public health challenges.	Short	• # of grants applied for • # of partnerships • # of partnerships in vulnerable communities	• # of successful grant applications
Goal 7: All Dallas' communities have access to healthy, local, sustainably grown food.				
FA1	Increase access to information on sustainable agriculture, best practices and the benefits of healthy and local foods.	Short	• # social media shares • # events attended • Increase in access to information about local and sustainable food	• Tons local food produced • # urban farms/community gardens • Participation rate of local restaurants holding 'Meatfree Mondays'
FA2	Create a Food Policy Council	Immediate	• Food Policy Council is formed and convenes to create a shared mission and objectives	• # of activities carried out by the Food Policy Council
FA3	Develop a Dallas comprehensive food and urban agriculture plan.	Short	• Comprehensive Food and Urban Agriculture Plan is aligned with goals and targets from CECAP and developed by a diverse group of stakeholders. • # of partnerships formed	• Lbs. of local food produced
FA4	Facilitate partnerships between schools and nonprofits to develop neighborhood-based growing initiatives and kitchen gardens in neighborhoods with low food access.	Short	• # of new urban gardens through program • Acres of neighborhood urban agriculture projects • # of new urban gardens through program in vulnerable communities • Acres of neighborhood urban agriculture projects in vulnerable communities	• Lbs of food produced • % of locally produced food out of total sold
FA5	Support nonprofits solving food justice issues in Dallas with grant writing and developing creative financing options.	Short	• # of grants applied for	• # of Households within 1/2 mile walk or 10 minute drive to a healthy food retailer. • # of successful grant applications
FA6	Partner with transportation organizations to identify creative transportation solutions to access healthy food retailers for low income residents in in neighborhoods with low food access.	Short	• # of on-demand DART trips provided	• # of Households within 1/2 mile walk or 10 minute drive to a healthy food retailer.
FA7	Partner with supermarkets, food retailers and other supporting organizations to bring mobile grocery stores to neighborhoods with low food access.	Short	• # of neighborhoods served with a regular mobile grocery store	• # of purchases made at the mobile grocery stores
FA8	Support the creation of food related green jobs in production, processing, storage, distribution and waste management.	Medium	• # of participants who complete workforce training	• # of green jobs

COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN

#	Action	Horizon	Potential Output Metrics	Potential Outcome Metrics
FA9	Establish a local food procurement plan to encourage local food purchasing at City-sponsored events	Short	• $ spent by public agencies on local foods	• % of locally produced food out of total purchased at City events
FA10	Enhance the market by providing incentives to sell locally produced food at affordable prices.	Medium	• # large employers signing up to support Community Supported Agriculture (CSA) schemes for their employees	• Share of locally produced and consumed food
FA11	Increase food security by supporting stakeholders in the food systems food supply chain with tools to plan for changing weather and extreme events.	Short	• # of retailer consultations	• # of food retailers with continuity plans in place
FA12	Identify opportunities for controlled-environment agriculture to increase local food production that is less energy and water intensive and protected from climate extremes	Short	• # of retailer consultations	• Tons locally produced food
FA13	Collaborate with organizations who are working to divert surplus food from grocery stores and markets to reach communities in need	Medium	• Lbs. of food donated	• Tonnes of rganic waste diverted from landfill
FA14	Adopt a special events ordinance that encourages procurement of locally sourced food, recycling of waste generated and compost bins at special events	Immediate	• Ordinance adopted	• Tonnes of organic waste diverted from landfill
Goal 8: All Dallas' communities breathe clean air.				
AQ1	Work with the Texas Commission on Environmental Quality to install additional air quality monitoring stations across the city.	Immediate	• Number of air quality monitors deployed city-wide • Mean average exposure to PM2.5 concentrations (milligrams per cubic meter) • Mean average exposure to NO2 concentrations (milligrams per cubic meter) • Mean average exposure to SO2 concentrations (milligrams per cubic meter) • Ground Level Ozone	• Detailed data regarding air quality at the neighborhood level
AQ2	Partner with nonprofits and schools to develop and implement non-regulatory monitors in neighborhoods.	Short	• Number of air quality monitors deployed city-wide in vulnerable communities • Mean average exposure to PM2.5 concentrations (milligrams per cubic meter) • Mean average exposure to NO2 concentrations (milligrams per cubic meter) • Mean average exposure to SO2 concentrations (milligrams per cubic meter) • Ground Level Ozone	• Detailed data regarding air quality at the neighborhood level
AQ3	Continue to support and expand on the Air North Texas campaign to raise public awareness and improve air quality.	Short	• Ground Level Ozone • Mean average exposure to PM2.5 concentrations (milligrams per cubic meter) • Mean average exposure to NO2 concentrations (milligrams per cubic meter) • Mean average exposure to SO2 concentrations (milligrams per cubic meter)	• Ozone attainment status • NAAQS attainment status for prirority pollutants
AQ4	Ensure new industries are an appropriate distance away from neighborhoods	Short	• New buffer zones identified • # Residential properties within x miles of industrial land uses (number to be determined during implementation planning) • # vulnerable communities within x miles of industrial land uses (number to be determined during implementation planning)	• Buffer zones are enforced • Detailed data regarding air quality at the neighborhood level

APPENDIX C: DALLAS' GREENHOUSE GAS EMISSIONS

This appendix provides additional detail to Section Greenhouse gas emissions and targets, and is organized into four sections:

1. **Base Year Inventory** – describes the sources of greenhouse gas emissions within the city and the relative contribution of various subsectors to the city's emissions in 2015.
2. **Forecasts –** describes how these emissions could change if no further action is taken and estimates annual emissions by subsector for 2030 and 2050 based on various growth factors (population, employment, and vehicle miles traveled).
3. **GHG Reduction Targets -** describes the City's emissions reduction targets and how they were developed.
4. **GHG Reductions** - based on actions in the plan, and a scenario that assumes mandates and higher participation rates.

BASE YEAR INVENTORY

The 2015 inventory was prepared according to the Global Protocol for Community Scale GHG Inventories (GPC), an internationally accepted protocol developed by the C40 Cities Climate Leadership Group (C40), the World Bank, ICLEI-Local Governments for Sustainability (ICLEI), and World Resources Institute (WRI). The inventory was prepared using a calculation-based methodology, which estimates emissions using a combination of activity data (measurements of energy use or other GHG-generating processes, such as fuel consumption by fuel type or vehicle miles traveled) and emissions factors (emissions per unit of activity data, such as emissions per kilowatt of electricity, or per mile driven). The results are expressed in metric tons of carbon dioxide equivalent (MT CO_2e), which allows emissions of different greenhouse gases to be compared as a single unit.

EMISSIONS BY SECTOR

Dallas' 2015 emissions inventory totals 19,529,600 MT CO_2e/year, which is approximately 15 MT CO_2e per person per year. Stationary energy is the largest contributor of GHG emissions in the city (64%), with transportation contributing most of the remainder (35%). Stationary energy sources refer to electricity and other combustible fuels utilized in buildings and the GHG emissions that are contributed through these (also see Glossary). The transportation and energy sectors account for approximately 99% of total emissions, meaning that local emissions reduction efforts will need to focus on these two sectors. The waste sector (including wastewater) is responsible for the remaining <1% of emissions.

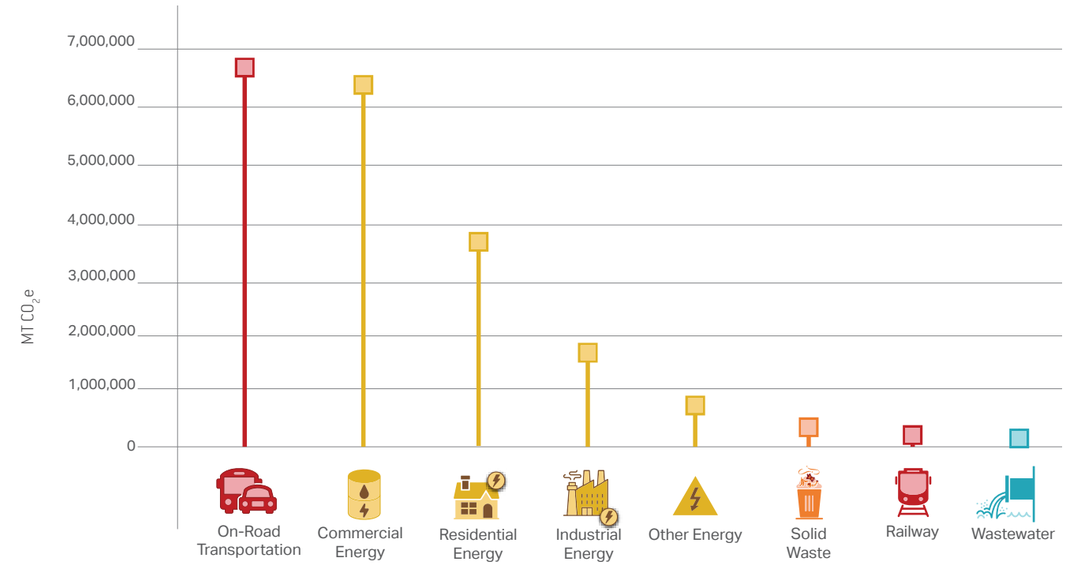


Figure A: 2015 Community Emissions by Subsector
Source: Data from 2015 GHG Inventory, AECOM 2020

Figure A, illustrates emissions by subsector and fuel type. As shown, the highest emitting subsectors are on-road transportation (35%), commercial energy use (33%), and residential energy use (20%). The four yellow bars represent stationary energy subsectors, red bars show transportation subsectors, and the orange and blue bars show waste subsectors (including wastewater).

Stationary Energy (Energy Use in Buildings)
Most emissions in the stationary energy sector come from commercial building energy (54%), followed by residential building energy (32%), and industrial energy (14%). Other sources include fugitive emissions from natural gas transmission and non-specified sources, make up the remaining 4%. Emissions from electricity consumption are the primary source of emissions in the commercial, residential, and industrial subsectors.

In fact, electricity consumption contributed 77% of total emissions in the stationary energy sector, compared to 23% from on-site combustion of fuels and fugitive emissions from natural gas distribution. This is due to a combination of relatively inexpensive electricity in the city, (which can minimize the need for energy efficiency improvements) and a relatively high level of carbon intensity in the electricity that is consumed.

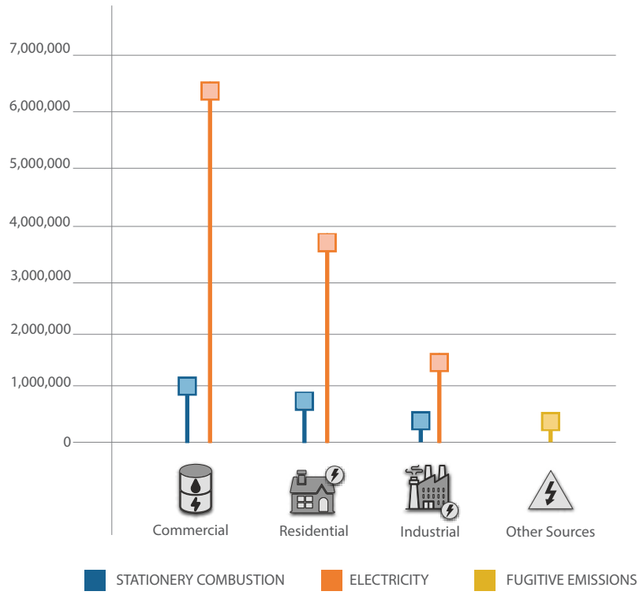


Figure B: Stationery Emissions by subsector and fuel type

Source: Data from 2015 GHG Inventory, AECOM 2020

Figure B shows this breakdown for stationary energy sources and fuel types.

Transportation

Within the transportation sector, on-road vehicles are the greatest source of emissions (99%). Railways contribute the remaining <1%. On-road vehicles are the highest emitting subsector across all sectors, contributing 35% of the community's total emissions. This indicates that increasing the amount of non-automotive travel in Dallas, improving the fuel economy of vehicles in Dallas, and switching to non-fossil fuel vehicles could lead to substantial reduction in communitywide emissions.

Waste

Emissions from the waste sector make up a relatively small amount of total emissions (<1%). However, from a broader environmental sustainability perspective, waste-based emissions are still an important area for local action. Within the waste sector, 99.9% of emissions come from solid waste, while the remainder are associated with wastewater treatment. Reducing the amount of waste sent to landfills can provide a variety of environmental benefits, including GHG emissions reductions.

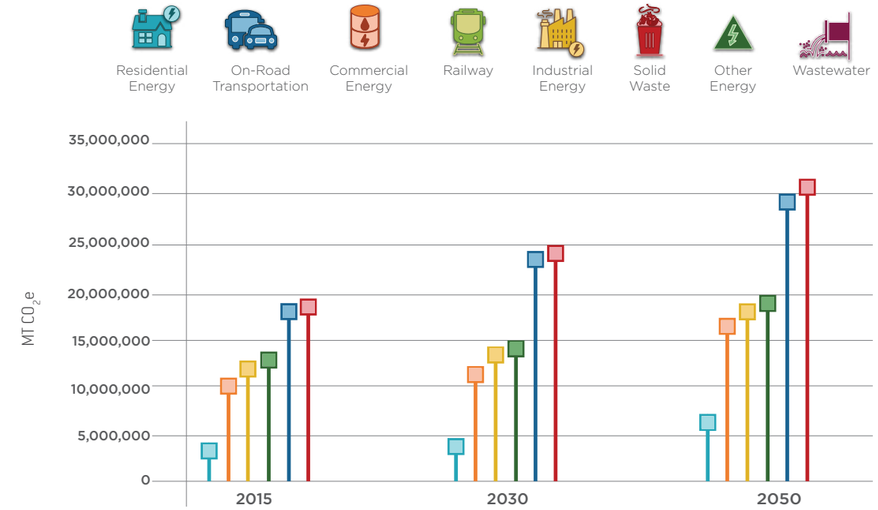


Figure C: Emissions Forecasts by Subsector

FORECASTS

The City used 2015 as the base year and its 2015 greenhouse gas inventory results as the basis to develop communitywide emissions forecasts for the plan's 2030 and 2050 horizon years to help understand how emissions could grow into the future without further intervention. This type of emissions forecast is sometimes called a "business-as-usual" forecast because it assumes no additional GHG reduction actions would be implemented beyond those already in place in the base year. Emissions were forecasted by subsector based on projected population growth, employment growth, and/or on-road travel forecasts from the North Central Texas Council of Governments (NCTCOG) regional travel demand model.

The emissions forecasts provide insight regarding the scale and source of local reductions necessary to achieve the City's GHG targets. They represent a best estimate at the time of CECAP preparation for the City's future emissions levels. However, no forecasting exercise is ever perfect, so climate action planning should always be an iterative process to continually update projections and compare against local GHG reduction progress.

Figure C illustrates Dallas' communitywide emissions by subsector in 2015 with forecasts for 2030 and 2050. Emissions are forecast to increase by 11,340,500 MT CO_2e/year between 2015 and 2050, which represents a 58% increase. This indicates that without further action, the city will see strong future emissions growth and continue to contribute to the effects of global climate change. While all sectors are projected to increase in total emissions, the percent of total emissions from stationary energy is projected to decrease from 64% in 2015 to 60% in 2050. During this period, the percent of total emissions from on-road transportation is projected to increase from 35% in 2015 to 39% in 2050. This indicates that regional travel demand is projected to increase at a faster rate than the city's population and employment growth.

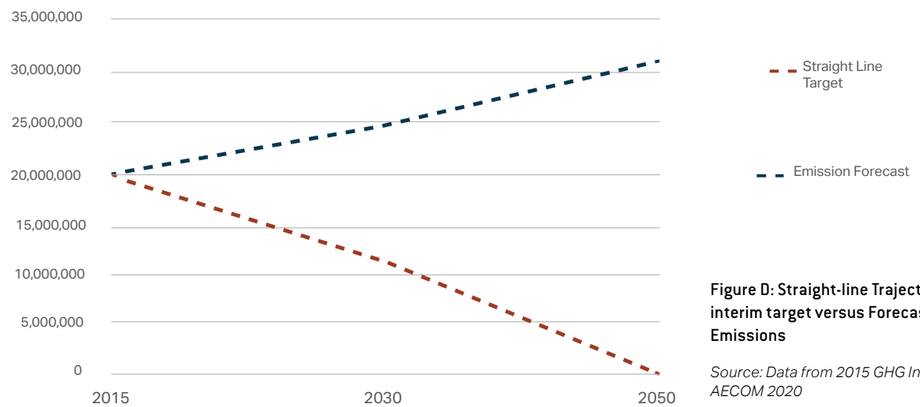


Figure D: Straight-line Trajectory interim target versus Forecasted Emissions

Source: Data from 2015 GHG Inventory, AECOM 2020

GHG REDUCTION TARGETS

This subsection describes the City of Dallas greenhouse gas emissions targets and how they were chosen. Emission reduction targets are a critical component of climate change mitigation planning—they demonstrate the City's commitment to global efforts on climate change and provide a goal post against which to evaluate the cumulative progress of the City's GHG reduction actions over time.

2050 CARBON NEUTRALITY TARGET

The City is committed to meeting the international emission reduction targets set by the Paris Agreement in 2016 and the goal to keep warming temperatures at or below 1.5 degrees Celsius. In 2017, Mayor Rawlings signed the Mayors National Climate Agreement in support of the Paris Agreement. Upon election in June 2019, Mayor Johnson reaffirmed the City of Dallas' commitment to this agreement. The City of Dallas is fully committed to protecting the community from the impacts of climate change and taking measures to reduce its GHG emissions.

To position the Dallas CECAP as a climate action plan that meets the ambitious objectives of the Paris Agreement, and with other cities around the world committed to bold action on climate change, the City of Dallas has adopted a target of carbon neutrality by 2050. Carbon neutrality refers to achieving net zero GHG emissions, through reducing emissions as much as possible and then balancing remaining emissions with carbon removal or carbon offset programs. The actions described in this plan are measurable, common sense solutions intended to move Dallas forward towards achieving this goal.

2030 INTERIM TARGET

Achieving the City's goal of carbon neutrality will require bold action, beginning now. Since the 2050 target year is still decades away, it is important to set interim targets to ensure the City is on a path to achieving its long-term goal. In evaluating interim targets for 2030, the City compared its emissions forecasts against different target options to understand the scale of reductions needed from the CECAP actions, and then selected an interim target that balances the City's ambition with the realities of Dallas' relatively high level of emissions in its base year.

A common approach used by cities is to set interim targets based on a straight-line trajectory from their base year to their long-term goal. **Figure D** shows this trajectory from the 2015 emissions base year to carbon neutrality by 2050. In Dallas, this would translate to a 43% reduction in total emissions below 2015 levels by 2030.

GHG REDUCTION ESTIMATE SCENARIOS

The following pages present the two GHG reduction scenarios analyzed for the CECAP. The left page in each scenario includes a figure illustrating the city's emissions forecasts, target, and impact from action implementation, as well as a summary of progress toward the 2030 and 2050 targets. The right page shows how the CECAP's actions are organized into GHG reduction strategies and notes the underlying assumptions for each strategy. The figures and lists of actions use colors to identify which GHG emissions sector is reduced through each action as indicated by the legend.

Scenario 1: GHG reductions based on CECAP actions

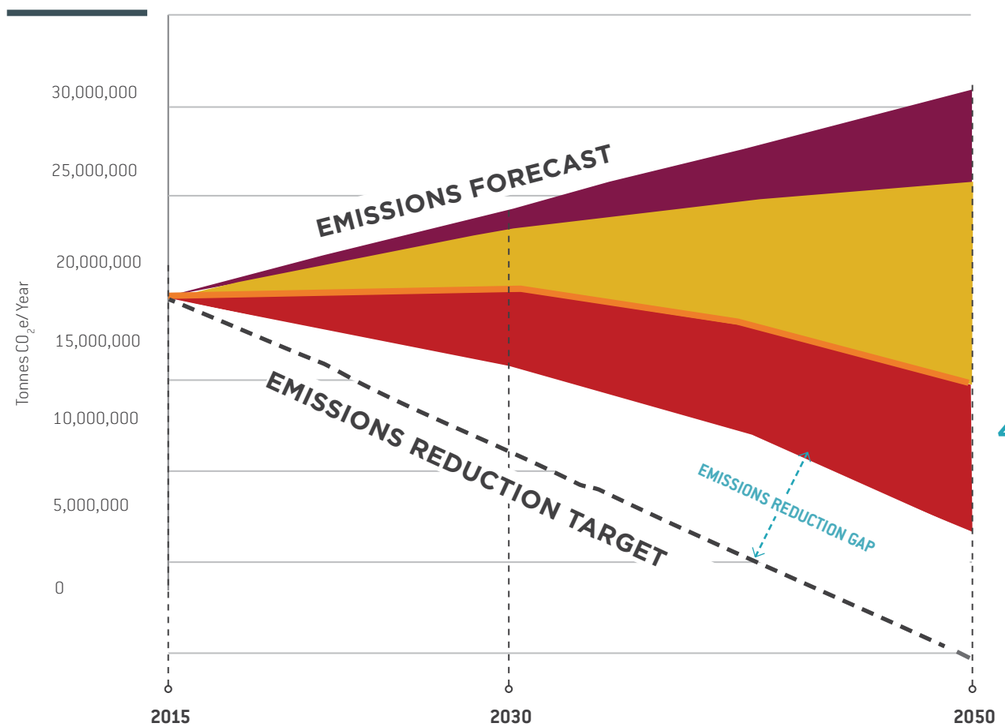
The first scenario represents implementation of the CECAP actions as currently written. This scenario would achieve 25% reductions below 2015 levels in 2030 and 66% below 2015 levels in 2050. As shown in the figure, the greatest reductions are associated with increased renewable electricity. This is a combination of the changes estimated to occur in the ERCOT grid, installation of rooftop solar photovoltaic systems, and a portion of residents and businesses voluntarily choosing electricity providers that offer 100% renewable energy options. The second greatest source of reductions are from transportation actions that would reduce total vehicle trips in the community and a gradual shift toward electric vehicles based on industry forecasts. Building energy actions that increase energy efficiency provide additional reductions and increase through 2050 with an assumption that all new construction is designed to be zero net energy beginning in 2030. Waste actions provide minimal GHG reductions due to that sector's relatively minor contribution to Dallas' total emissions inventory. However, waste actions will be critical to achieving carbon neutrality and provide other important co-benefits described in the plan.

Scenario 2: GHG reductions based on increased participation

The second scenario is more optimistic based on increased action implementation in certain areas, including through use of some regulatory mandates. This scenario would achieve 30% reductions below 2015 levels in 2030 and 71% below 2015 levels in 2050. The changes in the second scenario are highlighted through the list of GHG reduction strategies and implementation assumptions. This scenario would increase reductions in the building energy sector with requirements for residential and commercial building energy efficiency improvements beginning in 2030. It also includes an aggressive transportation demand management program to increase work-from-home participation for jobs that can be performed remotely. This would help to reduce total vehicle trips in the city. The remaining reduction gap in this optimistic scenario primarily represents a need to further increase use of renewable electricity and expand electrification of vehicles and buildings.

COMPREHENSIVE ENVIRONMENTAL AND CLIMATE ACTION PLAN

GHG REDUCTION ESTIMATE FOR MITIGATION ACTIONS



PROJECTED GHG REDUCTION — **25%** BELOW 2015 — **66%** BELOW 2015

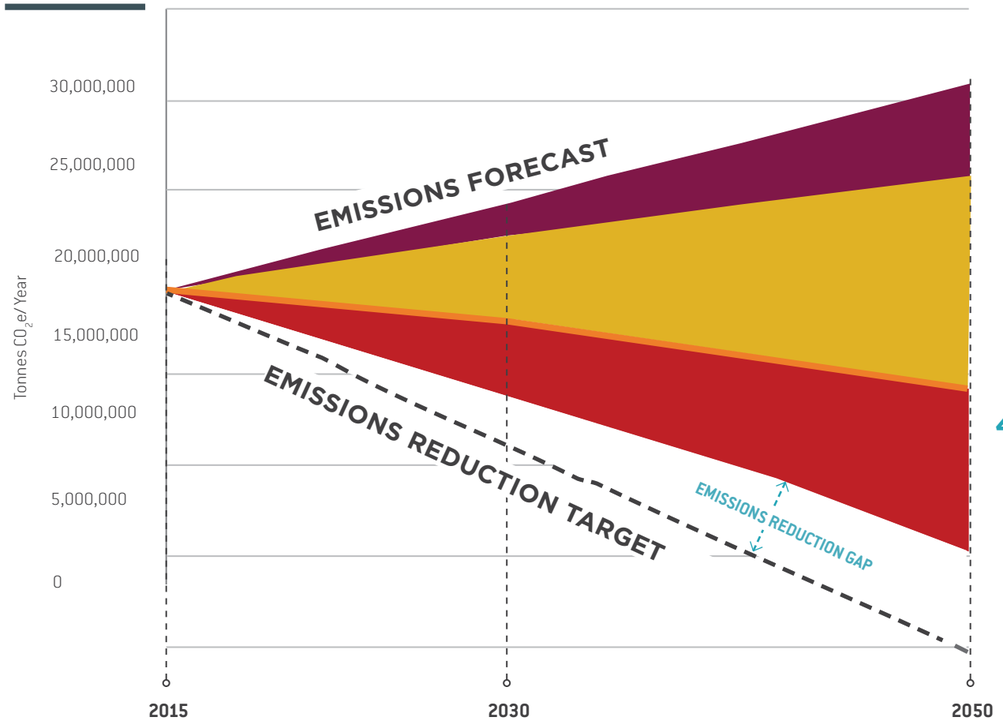
TARGET GHG REDUCTION — **43%** BELOW 2015 — **100%** BELOW 2015

LEGEND

- Actions that result in improved energy efficiency or fuel switching from natural gas to electricity.
- Actions that support waste diversion and treatment changes.
- Actions related to the electricity grid energy mix to increase use of renewable sources.
- Actions to increase use of public transit and active transportation options, as well as those that support the adoption of electric vehicle technology.

Tonnes CO_2e/Year (2030)	Tonnes CO_2e/Year (2050)	Actions	GHG Reduction Strategies	Assumptions
473,700	445,100	B1, B2, E7, E8, T16	Energy Efficiency: Existing City Buildings	• City buys RECs to offset 100% of municipal electricity use in 2030 and 2050. • 50% and 100% of municipal buildings achieve carbon neutrality by 2030 and 2050, respectively. • Love Field and Dallas Executive Airport achieve Level 3+ carbon accreditation.
339,400	455,100	B4, B9	Energy Efficiency: Existing Residential Buildings	• 10% of existing residential buildings reduce energy use 10% and 25% through lighting, appliance upgrades, space heating/cooling improvements, low-flow fixtures, and building envelope improvements by 2030 and 2050, respectively.
140,900	261,500	B7, B8, B10	Energy Efficiency: Existing Commercial Buildings	• 20% of existing commercial buildings reduce energy use 15% below 2015 levels by 2030 and 50% reduce energy use 20% below 2015 levels by 2050
-	2,034,600	B12, B14	Energy Efficiency: New Construction	• All new construction from 2030 onward is zero-net energy.
4,772,300	12,729,000	B11, E3, E4, E5, E6, E9	Renewable Energy: Increase Use	• Dallas achieves 10% and 50% of solar capacity potential by 2030 and 2050, respectively (currently achieves less than 1% potential). • 20% and 50% of customers purchase 100% renewable tariff by 2030 and 2050, respectively.
24,300	36,800	SW9	Energy Generation: Organics	• 35% and 80% of food and yard waste is diverted by 2030 and 2050, respectively.
56,400	103,900	SW5	Recycling: Paper Diversion	• 60% and 90% paper waste diversion by 2030 and 2050, respectively.
741,400	3,469,700	T3, T4, SW4	Electric Vehicles: Passenger	• 14% and 50% passenger vehicles electric in 2030 and 2050, respectively.
36,100	402,300	T1	Electric Vehicles: Transit	• 75% and 100% of DART buses are electric by 2030 and 2050, respectively.
1,300	11,700	T11, T12	Land Use: Transit Oriented Development	• 10% and 30% of new housing units are in TOD locations by 2030 and 2050, respectively.
635,800	2,762,600	T2, T5, T6, T9, T7, T10, T13, T14, T15	Travel Mode Shift: SOV Trip Reduction	• Travel mode shift from single occupant vehicle to Bus and Light rail from 88% to 79% in 2030 and 88% to 62% in 2050.
2,603,600	1,536,200		Vehicle Fuel Efficiency: Federal	• Additional reductions associated with implementation of federal vehicle fuel efficiency standards were included in the wedge diagram and total 2,603,600 and 1,536,200 MT CO_2e/yr for 2030 and 2050, respectively.

GHG REDUCTION ESTIMATE FOR HIGH PARTICIPATION SCENARIO



PROJECTED GHG REDUCTION — **30%** BELOW 2015 — **71%** BELOW 2015

TARGET GHG REDUCTION — **43%** BELOW 2015 — **100%** BELOW 2015

LEGEND

- Actions that result in improved energy efficiency or fuel switching from natural gas to electricity.
- Actions that support waste diversion and treatment changes.
- Actions related to the electricity grid energy mix to increase use of renewable sources.
- Actions to increase use of public transit and active transportation options, as well as those that support the adoption of electric vehicle technology.

Tonnes CO_2/Year (2030)	Tonnes CO_2/Year (2050)	Actions	GHG Reduction Strategies	Additional Assumptions
473,700	445,100	B1, B2, E7, E8, T16	Energy Efficiency: Existing City Buildings	
339,400	544,100	B4, B9	Energy Efficiency: Existing Residential Buildings	• 100% of homes sold from 2030 through 2050 reduce energy use by 10% through energy efficiency improvements at point-of-sale.
600,200	857,900	B7, B8, B10	Energy Efficiency: Existing Commercial Buildings	• 100% commercial buildings perform retro-commissioning to reduce energy use 15% by 2030, 100% commercial buildings perform comprehensive energy upgrade program to reduce energy use 30% by 2050.
-	2,034,600	B12, B14	Energy Efficiency: New Construction	
4,752,500	12,531,500	B11, E3, E4, E5, E6, E9	Renewable Energy: Increase Use	• *Changed as a result of decreased electricity use from other actions.*
24,300	36,800	SW9	Energy Generation: Organics	
56,400	103,900	SW5	Recycling: Paper Diversion	
659,300	2,977,400	T3, T4, SW4	Electric Vehicles: Passenger	• *Changed as a result of decreased electricity use from other actions.*
36,100	402,300	T1	Electric Vehicles: Transit	
1,300	11,700	T11, T12	Land Use: Transit Oriented Development	
1,520,700	3,922,900	T2, T5, T6, T9, T7, T10, T13, T14, T15	Travel Mode Shift: SOV Trip Reduction	• 10% of single occupant vehicle trips are avoided in TDM work from home programs.
2,314,300	1,316,800		Vehicle Fuel Efficiency: Federal	• *Changed as a result of fewer vehicle trips from other actions.*