Plano
City of Excellence

# City of Plano
# Cleaner Air & Reduced Emissions (CARE) Strategy


May 2020

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# INTRODUCTION

## Document Overview

The City of Plano (the City) has a long history of demonstrated leadership in sustainability.

- In 2015, Plano became only the second city in Texas to receive recognition from STAR Communities for its commitment to promoting a healthy environment, economy, and community.
- Plano's Sustainability Implementation Plan highlights the City's work in integrating green and sustainable practices internally and in the greater community.
- The City of Plano has also adopted the City of Plano Comprehensive Plan, which embeds sustainability principles into the City's long-range planning and development efforts.

Now, in an effort to stem the impacts of extreme weather and climate events, the City of Plano is seeking opportunities to reduce greenhouse gas emissions from City operations and the overall community. Hundreds of cities across the world have established greenhouse gas reduction targets and developed plans to increase their resilience to extreme weather impacts.

The Cleaner Air & Reduced Emissions (CARE) Strategy outlines a potential path forward for the City of Plano as it considers key policies and investments to reduce emissions, improve air quality, and promote public health. The CARE Strategy considers the following greenhouse gas (GHG) reduction targets for both municipal operations and community-wide emissions:

**City operations**

**2030 Target:** 80% reduction from 2017 levels

**Carbon neutrality by 2040**

**Community**

**2030 Target:** 25% reduction from 2017 levels

**Carbon neutrality by 2050**

The CARE Strategy focuses specifically on **high-impact carbon reduction opportunities** and describes critical considerations for City staff and leadership to move towards implementation. The CARE Strategy also provides an overview of weather- and climate-related risks with the potential to impact City and community infrastructure, resources, and quality of life outcomes. The CARE Strategy outlines **actions to increase resiliency and environmental health** in the face of these risks.

**Photo**: City of Plano

*"The interconnectivity of environmental policy, equity, and public health principles is reflected in this strategy that provides a roadmap, guided by data, to decreased emissions and improved environmental public health and resilience."*

**Rachel Patterson**

Director of Environmental Health and Sustainability

# INTRODUCTION

## Methodology

The development of the CARE Strategy was led by the City of Plano's Sustainability and Environmental Education Division (SEED) working in partnership with the interdepartmental Sustainability Advisory Council (SAC) and Guidehouse, a global consultancy with expertise in sustainability and energy policy.

The CARE Strategy development process consisted of three main phases:

### GHG Inventory and Forecasting:

- Validation of the 2017 Inventory of Energy and Emissions report prepared by ICLEI.
- Forecasting of community-wide emissions for a Business-As-Usual (BAU) scenario to the year 2050.

### Vulnerability and Risk Assessment:

- Compilation of climate projections and related indicators to develop descriptive narratives of potential local extreme weather and climate impacts in Plano.
- Structured interviews with key City and regional stakeholders to identify weather- and climate-related vulnerabilities.
- Prioritization of vulnerabilities and assessment of primary risks based on the likelihood and consequence of each risk.

### Development of Mitigation and Adaptation Measures:

- Identification of high-potential mitigation and adaptation measures based on global best practices, actions taken by peer cities, and input from SAC and community stakeholders
- Prioritization of mitigation actions based on modeling of emissions reduction potential as compared to a BAU emissions scenario.
- Description of potential implementation options, timeframes, relative cost, and partners for a select list of high-impact mitigation actions.

The findings of this process are captured in the CARE Strategy, which charts a potential decarbonization pathway that will get the City of Plano closer to meeting its interim GHG reduction targets and ultimate goal of Net Zero emissions by 2050, in line with best practice among leading cities.

# THE CHALLENGE

Weather patterns in Texas are changing.
The latest science shows that the burning of fossil fuels, which releases greenhouse gases into the atmosphere, is driving changes in climate. To avoid the worst impacts, cities must strategically cut back on their reliance on dirty fuels and move towards advanced energy conservation measures and clean, safe, and renewable energy.

Photo: City of Plano

# THE CHALLENGE

## Community GHG Emissions

**Target:** Net Zero by 2050

The first step in establishing an emissions reduction strategy is understanding what future Business-As-Usual (BAU) emissions will look like in the target year if no mitigation actions are taken. Plano began this step in its 2017 Inventory of Energy and Emissions report, using growth parameters specific to the City of Plano to project emissions out to 2030. The CARE Strategy uses the same parameters to project Plano's community emissions out to the 2050 target year. The forecast, shown in chart and graph form below (Figure 1), establishes the following:

- Plano's GHG emissions will decrease by 12% by 2050 as a result of a "natural" greening of the grid and increased fuel efficiency for vehicles.
- The transportation, commercial, and residential sectors are Plano's largest source of emissions, making up 90% of 2050 GHGs.
- Plano must take additional action to reduce the remaining 88% of the City's forecasted emissions to reach its 2050 Net Zero target and should focus on the main emission sources noted above.

| Sector | 2017 Emissions ($mtCO_2e$) | 2050 BAU Emissions ($mtCO_2e$) | Percent Change |
|---|---|---|---|
| Transportation & Mobile Sources | 1,640,709 | 1,507,040 | -8% |
| Industrial Energy | 217,592 | 162,453 | -25% |
| Commercial Energy | 960,942 | 755,111 | -21% |
| Residential Energy | 949,579 | 831,861 | -12% |
| Process & Fugitive Emissions | 8,431 | 16,206 | 92% |
| Solid Waste | 66,600 | 128,020 | 92% |
| **TOTAL** | **3,843,853** | **3,400,691** | **-12%** |

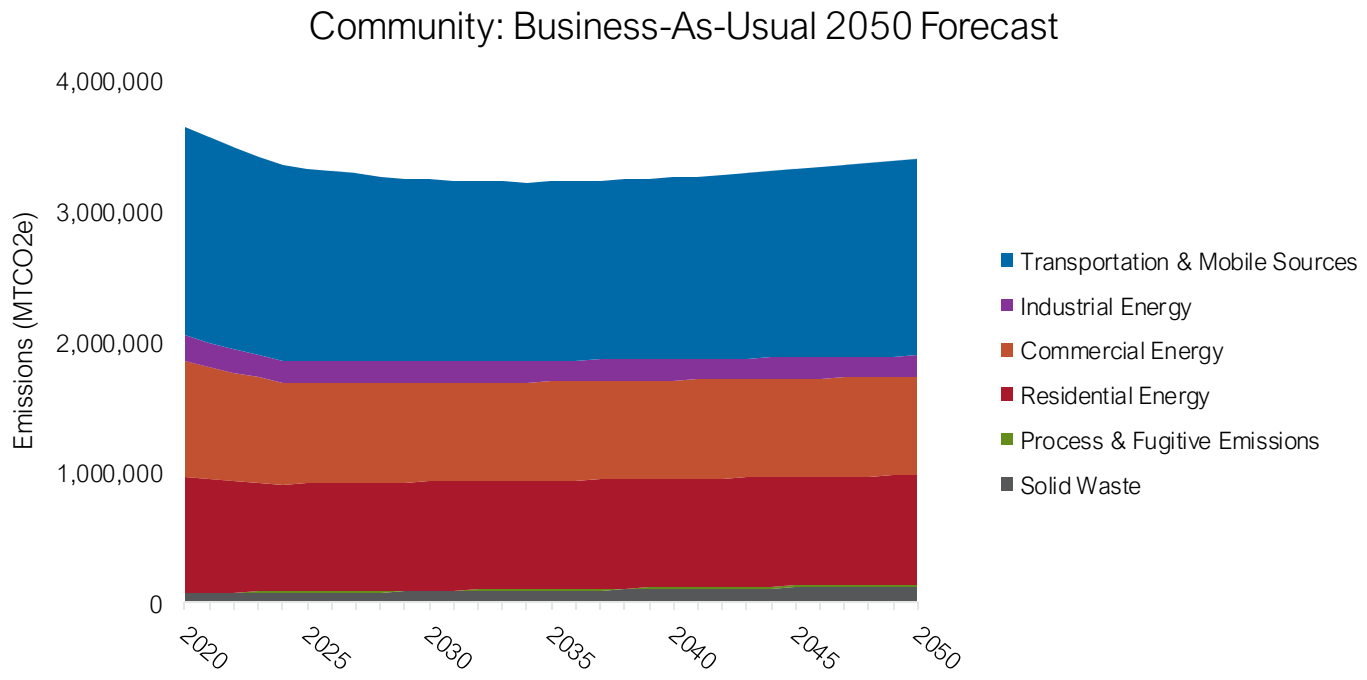



**Figure 1:** Community Emissions to 2050 in a BAU Scenario

**Source:** Guidehouse analysis

# THE CHALLENGE

## Municipal GHG Emissions

**Target:** Net Zero by 2040

Plano also conducted a BAU emissions forecast through 2030 for its municipal operations in the 2017 Inventory of Energy and Emissions report. This forecast was extended in a similar manner to the community forecast out to the year 2040, the Net Zero target year for municipal emissions. The chart and graph below (Figure 2) illustrate the municipal emissions forecast, with the main takeaways being:

- GHG emissions resulting from municipal operations will decrease by 30% by 2040 as a result of a "natural" greening of the grid and increased fuel efficiency for vehicles.
- However, that leaves over two-thirds of these emissions still to be mitigated to reach Plano's 2040 carbon neutrality target for municipal sources.
- The City must focus on reducing the emissions from its buildings, vehicle fleet, and solid waste operations.

| Sector | 2017 Emissions ($mtCO_2e$) | 2040 BAU Emissions ($mtCO_2e$) | Percent Change |
|---|---|---|---|
| Buildings & Facilities | 17,766 | 9,842 | -45% |
| Street Lights & Traffic Signals | 6,089 | 3,092 | -49% |
| Vehicle Fleet | 10,671 | 7,455 | -30% |
| Employee Commute | 6,362 | 4,338 | -32% |
| Water & Wastewater Treatment Facilities | 7,973 | 6,409 | -20% |
| Solid Waste Facilities | 3,704 | 5,841 | 58% |
| **TOTAL** | **52,565** | **36,977** | **-30%** |

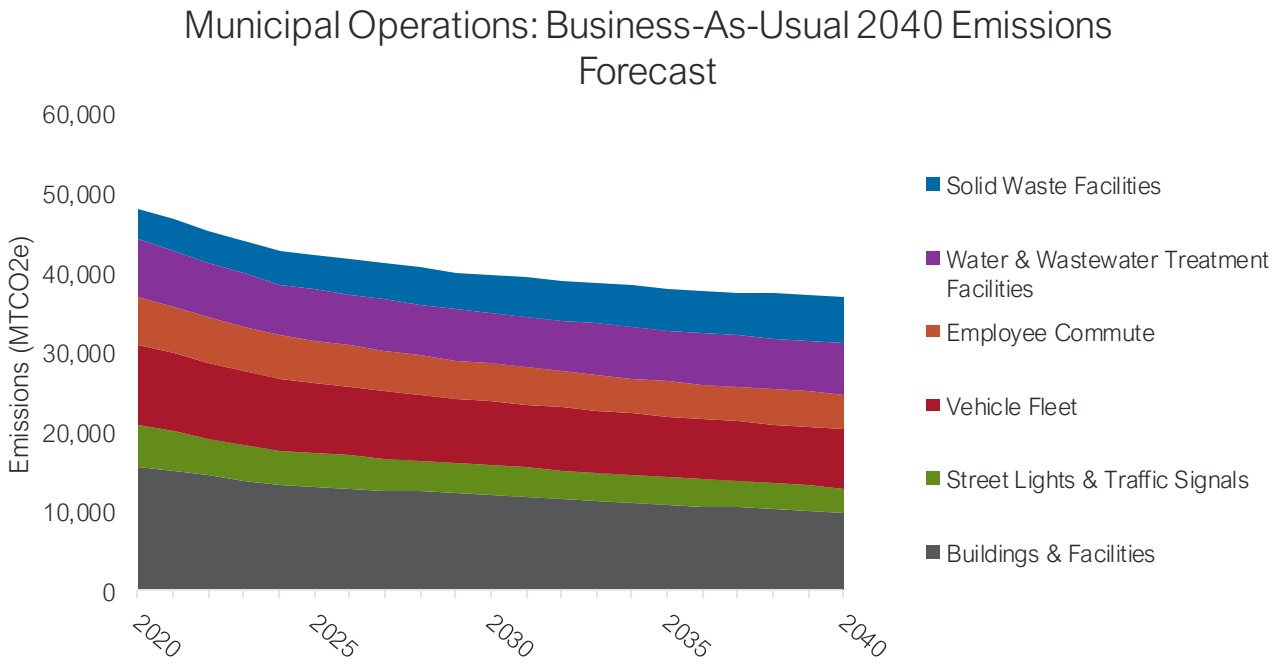



**Figure 2:** Municipal Emissions to 2040 in a BAU Scenario

**Source:** Guidehouse analysis

# THE CHALLENGE

## Extreme Weather and Climate Projections

While changes in weather and climate patterns are expected to differ by region, Texas will generally see rising average temperatures and more extreme weather events, including heat waves, heavy precipitation, and severe storms. Climate projections for the Plano region indicate an upward trend in the intensity and frequency of severe storms and heavy precipitation events into the 2040s and 2050s. Plano will also see an increase in the number of hot (max T>80°F) and very hot (max T>100°F) days, along with an increased risk of water stress related to drought. These changing conditions present risks to Plano residents, infrastructure, ecosystems, and the local economy, highlighting the need for increased preparedness and resilience efforts.

**Table 1:** Hazards and Future Projections

| Extreme Weather and Climate Hazard | Projected Trend | Indicators | Geography | Climate Model |
|---|---|---|---|---|
| Severe Storms | ↑ | Intensity and frequency of severe storm events | Southern Great Plains | Fourth National Climate Assessment |
| | ↑ | Conditions conducive to severe weather (e.g., hailstorms, tornados, thunderstorms) | Southern Great Plains | Fourth National Climate Assessment |
| Flooding | ↑ | Number of heavy precipitation events | Texas | Fourth National Climate Assessment |
| | — | Annual rainfall amounts | Plano | CMIP5 Model [NOAA Climate Explorer] |
| Drought | ↑ | Water stress levels | Plano | WRI Aqueduct |
| | ↓ | Total and available renewable surface water | Plano | WRI Aqueduct |
| Extreme Heat | ↑ | Number of days w/ max > 100°F | Plano | CMIP5 Model [NOAA Climate Explorer] |
| | ↑ | Number of days w/ min > 80°F | Plano | CMIP5 Model [NOAA Climate Explorer] |
| | ↑ | Number of cooling degree days | Plano | CMIP5 Model [NOAA Climate Explorer] |

**Source**: Fourth National Climate Assessment, NOAA Climate Explorer (CMIP5 Model), WRI Aqueduct, Guidehouse analysis

# GHG EMISSIONS REDUCTION OPPORTUNITIES

In the City of Plano, the biggest opportunities for GHG reduction exist in utility-scale electricity procurement, existing buildings, and the transportation sector.

**Photo**: City of Plano

# GHG EMISSIONS REDUCTION OPPORTUNITIES

## An Aggressive Scenario

This Aggressive Scenario represents one of many potential combinations of reduction strategies to lower Plano's emissions towards its Net Zero target. This particular scenario relies heavily on vehicle electrification to reduce emissions from transportation, and a combination of energy efficiency and increased utility-scale renewable energy to reduce emissions from the building sector. However, many other combinations exist, and Plano should build an action plan that best aligns with City capabilities, existing initiatives, and stakeholder resources, along with any emerging technologies and political support. For the detailed inputs to the particular example demonstrated in Figure 3, see Table 3 in Appendix C.

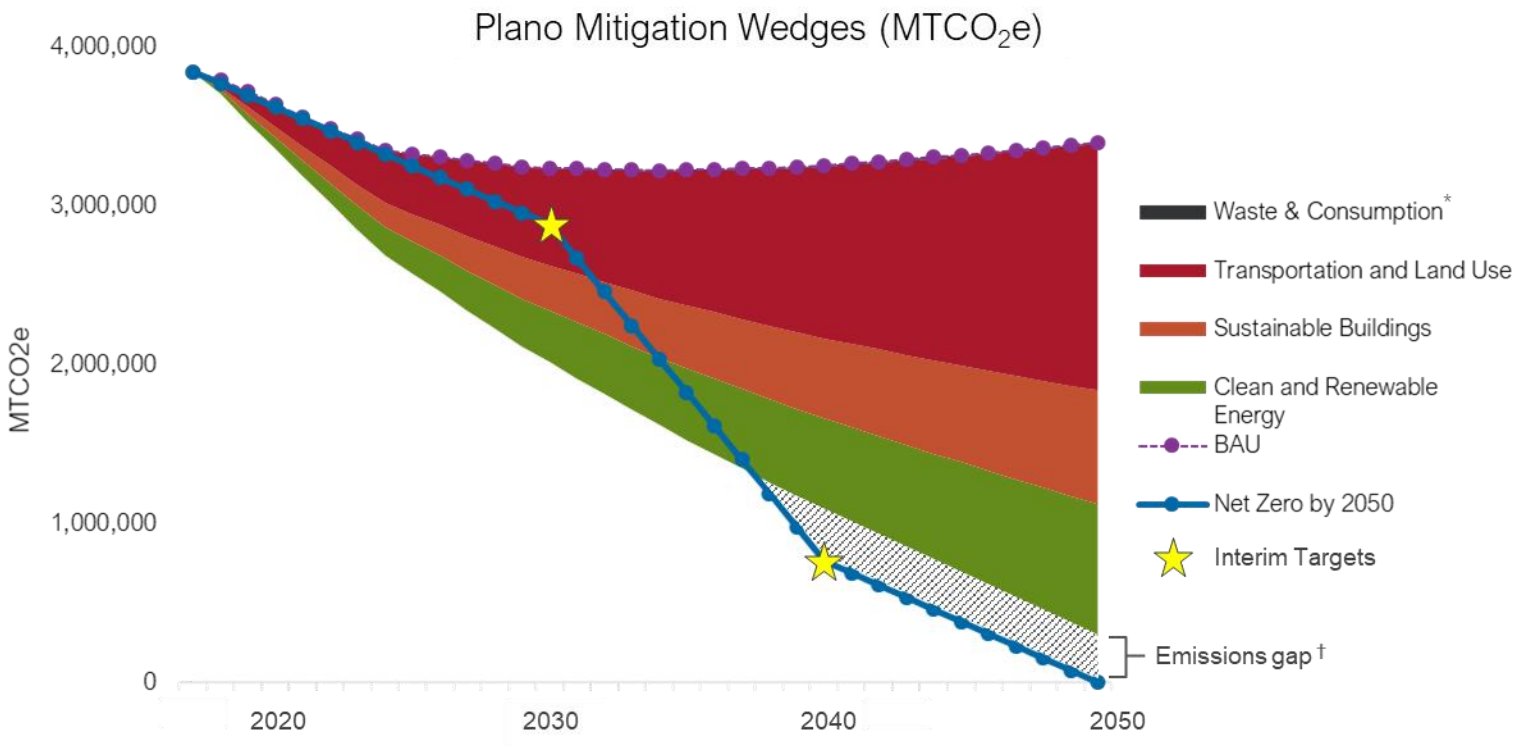



**Figure 3:** An Aggressive GHG Mitigation Pathway to 2050

## This strategy requires:

| | |
|---|---|
| 75% | of Plano passenger vehicles to be electric by 2050 |
| 15% | of new construction to be Zero Net Energy (ZNE) by 2050 |
| 60% | of existing buildings to have received deep energy efficiency retrofits or upgrades by 2050 |
| 126,000 | MWh of residential or community solar generated by 2030 |
| 321,000 | MWh of residential or community solar generated by 2050 |
| 1,644,000 | MWh of utility-scale electricity to come from renewables by 2030 |
| 4,174,000 | MWh of utility-scale electricity to come from renewables by 2050 |

**Source**: Guidehouse analysis

* Waste & Consumption wedge is not visible because potential emissions reductions from this sector are very small compared to others.

† This gap represents emissions that are difficult to mitigate with the current technology and can be bridged with carbon offsets

# GHG EMISSIONS REDUCTION OPPORTUNITIES

## Utility-Scale Renewable Energy Procurement

**456,000 $MTCO_2e$** 2050 Maximum Abatement Potential

**Description:** Increase the percentage of residential, commercial, and industrial users consuming utility-scale renewable electricity in Plano by:

- Developing a campaign to encourage residents to switch to renewable electricity plans.
- Facilitating renewable electricity purchasing for Plano residents and businesses through community choice aggregation.
- Decarbonizing the ERCOT energy grid through regional and state-level engagement.

Maximum potential is based on the optimal scenario where ERCOT reaches 100% renewables or all electricity procured and consumed by Plano businesses and residents comes from 100% renewables.

## Promote Fleet and Passenger Vehicle Electrification

**1,130,000 $MTCO_2e$** 2050 Maximum Abatement Potential

**Description:** Promote the electrification of vehicle fleets and private vehicles and expansion of electric vehicle infrastructure throughout the city by:

- Developing educational outreach campaigns and incentives to accelerate the transition to EVs among Plano residents.
- Exploring electrification partnership opportunities (e.g., electrify PISD school fleets).
- Promoting "EV-Ready" buildings by providing incentives to developments above a certain square footage or occupant threshold to include capacity for EV charging infrastructure and adopt "EV-Ready" ordinances where possible.

## Increase Energy Efficiency in Existing Buildings

**996,000 $MTCO_2e$** 2050 Maximum Abatement Potential

**Description:** Increase energy efficiency in existing buildings by:

- Considering a benchmarking and disclosure process for large commercial, industrial, and multifamily buildings above a certain square footage threshold.
- Increasing access to building energy performance data to target energy efficiency upgrades and programs to buildings with the highest energy-savings potential.
- Exploring energy efficiency and weatherization finance mechanisms, including Property Assessed Clean Energy (PACE) and Warehouse for Energy Efficiency Loans (WHEEL), and others.
- Promoting existing energy efficiency programs and rebates.

Maximum potential is based on the assumption that all commercial and residential buildings will have received retrofits, upgraded equipment and technologies, and weatherization.

## Biggest Opportunities

# ADAPTATION & RESILIENCE OPPORTUNITIES

As extreme weather events become more severe and Plano's climate shifts to a hotter and drier future, Plano will see detrimental impacts to people, infrastructure, and ecosystems. The CARE Strategy identifies the key weather- and climate-related risks Plano will face and highlights adaptation actions with the opportunity to increase community resilience.

**Photo**: City of Plano

# ADAPTATION & RESILIENCE OPPORTUNITIES

## Extreme Weather and Climate Risk Assessment

Extreme weather and climate events have the potential to disrupt City operations, damage infrastructure and ecosystems, and threaten public health and safety. Severe storms, flooding, extreme heat, and drought are among the major hazards facing the City of Plano.

Through an intensive stakeholder interview process and review of internal and external sources on risk and resilience, a list of key weather- and climate-related impacts was identified for the City of Plano. These impacts include risks to public health, energy and water systems, built infrastructure, parks and ecosystems, transportation, emergency response, and general City operations. These risks are summarized in Table 2.

Impacts were then ranked based on an assessment of (1) the likelihood of the impact being experienced in the Plano area and (2) the expected consequences resulting from the occurrence of the impact. Public health-related impacts emerged as the greatest risks to the City of Plano. These include an increase in illnesses, injuries, or deaths related to extreme heat, an increase in the number of poor air quality days, and an increase in the incidence of vector-borne and infectious diseases. This initial risk assessment serves as the basis for the resiliency recommendations outlined in the CARE Strategy. However, the City of Plano should continually reassess the risks listed below and consider any other emerging risks as conditions continue to change and new information and data becomes available.

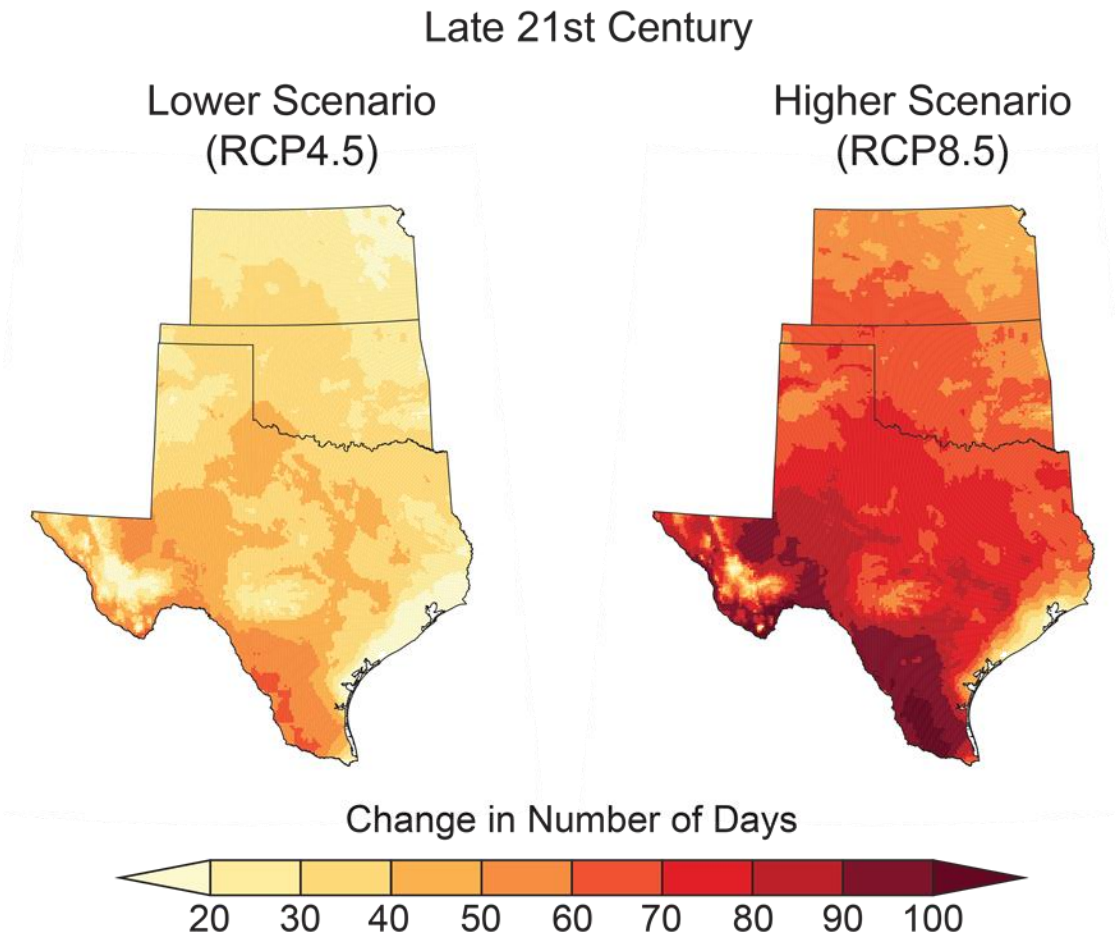



**Figure 4:** Projected Increase in the Number of Days Above 100°F. Graphic from Fourth National Climate Assessment.

**Source**: Guidehouse analysis

# ADAPTATION & RESILIENCE OPPORTUNITIES

## Extreme Weather and Climate Risk Assessment

**Table 2:** Primary Extreme Weather and Climate Risks

| # | Hazard | Impact | Relevant Service Area | Risk Level |
|---|---|---|---|---|
| 1 | Extreme heat | Increased incidence of heat-related illnesses, injuries, or death, especially among vulnerable groups | Public health | High |
| 2 | Extreme heat | Increased incidence of poor air quality days and related health impacts | Public health | High |
| 3 | Flooding, extreme heat | Increased incidence of infectious disease (e.g., vector-borne and neglected tropical diseases) | Public health | High |
| 4 | Extreme heat | Increased energy costs and utility cost burden, especially among low-income groups and people living in older homes | Energy, built infrastructure | Medium |
| 5 | Extreme heat, drought | Decreased ecosystem health leading to tree and vegetation death | Ecosystems | Medium |
| 6 | Severe storms | Increased incidence of extreme events (e.g., hailstorms, tornadoes) impacting infrastructure, vehicles, homes, buildings, and other assets | Built infrastructure | Medium |
| 7 | Flooding | Increased potential for contamination of water supply and water reservoirs by floodwaters | Water supply | Medium |
| 8 | Severe storms | Increased risk of impacts to critical infrastructure and facilities, such as facilities with hazardous materials | Built infrastructure | Medium |
| 9 | Flooding | Increased damage to park trails and paths and disruption of maintenance schedules | Parks system | Medium |
| 10 | Severe storms, flooding | Increased health and safety incidents leading to strained emergency response resources | Public health, emergency response | Medium |
| 11 | Severe storms, flooding | Increased 911 call volumes and flood-related rescues and emergencies | Emergency response | Medium |
| 12 | Flooding | Increased disruption of transportation systems | Transportation | Medium |
| 13 | Drought, flooding | Increased deterioration of roads, underground infrastructure, and building foundations due to expansion of soils | Transportation, built infrastructure | Medium |
| 14 | Extreme heat, drought | Decreased water quality and stream health | Ecosystems | Medium |
| 15 | Severe storms, flooding | Increased disruption of City operations due to severe weather impacts on employees and infrastructure | City operations | Low |
| 16 | Flooding | Increased downstream impacts due to upstream development and stormwater runoff | Built infrastructure | Low |
| 17 | Drought | Increased need for water restrictions | Water supply | Low |

**Source:** Guidehouse analysis

# ADAPTATION & RESILIENCE OPPORTUNITIES

## Public Health Preparedness and Response

**Primary Risks** Heat-related illness, vector-borne diseases, poor air quality

**Description:** Monitor and prevent public health impacts from extreme weather and climate hazards by:

- Increasing monitoring and understanding of extreme heat and air quality related health impacts and improving reporting, data-sharing, and coordination.
- Dedicating public health and outreach resources for vulnerable groups.
- Increasing vector control and infectious disease prevention activities in light of changing weather and climate conditions that threaten the expansion of emerging infectious diseases, including vector-borne and neglected tropical diseases.
- Reducing the effects of extreme heat and urban heat island (UHI) on public health and quality of life outcomes.
- Improving outdoor air quality and reducing air quality impacts on public health through various pollution prevention strategies.

## Infrastructure Resilience

**Primary Risks** High energy costs, extreme events, impacts to critical infrastructure

**Description:** Retrofit existing infrastructure and incorporate resilient design principles into new infrastructure, including:

- Hardening City-owned infrastructure and assets against the impacts of extreme weather and climate hazards.
- Developing incentives and strengthening standards and requirements, where possible, to improve the resiliency of residential and commercial sites and buildings.
- Prioritizing building and home energy efficiency upgrades and other financial and educational strategies to reduce utility cost burden among vulnerable groups.

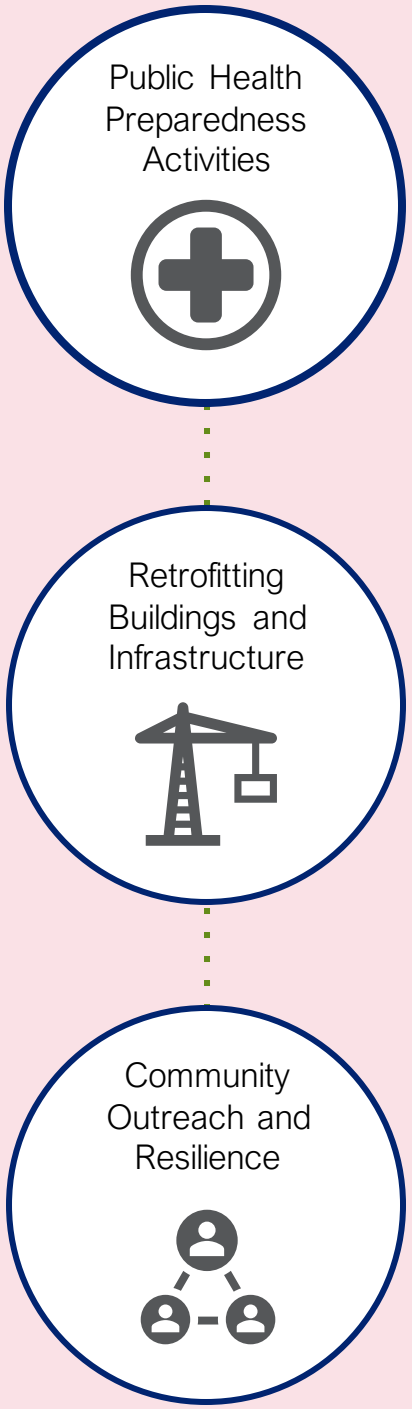
## Disaster Planning and Management

**Primary Risks** Extreme events, including severe storms, tornados, and flooding

**Description:** Strengthen preparedness, response, and recovery mechanisms to promote community resilience through the following actions:

- Increasing disaster preparedness, response, and recovery and focusing on seniors, homebound individuals, and other isolated groups.
- Strengthening community-based disaster preparedness and outreach.
- Ensuring local critical infrastructure sites and facilities are prepared for extreme weather and other disasters.

## Biggest Opportunities



# IMPLEMENTATION OPTIONS

Successful implementation of GHG reduction measures will require the involvement and buy-in of City leadership, businesses, regional partners, and the Plano community. The CARE Strategy outlines steps the City can take to pursue the greatest opportunities for action, including potential partners, implementation timelines, costs, and impact.

**Photo**: City of Plano

# OVERVIEW

## Implementation Strategies

The following section highlights specific implementation strategies available to Plano with the greatest potential for emissions reductions. These high-impact implementation strategies fall under the following categories:

### Transportation & Land Use
*A connected city with sustainable, electrified mobility options.*

### Sustainable Buildings
*New and existing buildings that are efficient and green.*

### Clean & Renewable Energy
*An energy supply that is clean, affordable, and reliable.*

### Waste & Consumption
*A circular economy that optimizes material use and minimize waste.*

## Guide to the Implementation Section

The following section outlines high-impact strategies that could be implemented to help Plano mitigate its GHG emissions and reach Net Zero by 2050. This section conveys important information about each strategy and is organized as follows:

*Maximum* GHG reduction potential of the implementation strategy in 2050*

Relative cost of implementation for the City†

###,### $mtCO_2e$ reduced

$$

Description of implementation strategy

| Action | Phase | Approach | Lead Organization |
|---|---|---|---|
| This column lists the specific sub-actions that supports the larger implementation strategy | **Near-term:** within 5 years<br>**Long-term:** beyond 2025 | This column outlines potential paths forward to achieve the select action | This column identifies key agencies best positioned to take the lead on the action |

You will also see the following informational call-outs throughout this section:

**Stakeholder Feedback** — Feedback received during internal and external stakeholder engagement meetings

**CASE STUDY** — Implemented examples of the strategies that are discussed

**Info call-out** — Additional explanation of certain technologies, concepts, or challenges related to the implementation strategy

*Maximum reduction that the strategy can achieve as a stand-alone solution based on projected 2050 emissions. Represents the non-cumulative reduction potential that can be reached by 2050.

†Relative cost estimates represent potential impacts to the City budget from infrastructure, marketing/outreach, or procurement costs in order to achieve maximum GHG reductions for each strategy.

# TRANSPORTATION & LAND USE

## TR-1: Increase carbon-free and active mobility options throughout the city.

226,000 $mtCO_2e$ reduced | $$

Implementing programs and investing in infrastructure that promote alternative modes of non-fossil-fuel transportation, including walking, biking, and micro-mobility, has the potential to mitigate approximately 15% of transportation emissions.

| Action | Phase | Approach | Lead Organization(s) |
|---|---|---|---|
| Install designated and protected bike lanes. | Near-term | Deploy funding to address known gaps in bicycle infrastructure and develop a bicycle master plan to guide future investments. | Public Works, Planning, Parks and Recreation, Engineering |
| Create designated micro-mobility areas and paths in high use zones. | Near-term | Work with e-scooter and other micro-mobility companies to identify high use zones where designated travel lanes would be beneficial (e.g., Shops at Legacy, Legacy West). | Public Works, Special Projects, Engineering |
| Prioritize micro-mobility and human-powered transportation modes. | Near-term | Assess the City's current expenditures on transportation infrastructure by mode type to address gaps in funding for programs and infrastructure that support alternative transportation modes, including active transit and micro-mobility. | Public Works, Engineering |
| Support the development of compact walkable communities. | Long-term | Implement the City of Plano Comprehensive Plan Pedestrian Environment, Transit-Oriented Development, and related policies to ensure future development prioritizes compact walkable communities over sprawl. | Public Works, Planning, Engineering |

### Stakeholder Feedback

Stakeholders expressed less interest in this as a strategy, due in part to a perception of limited capabilities to implement these solutions and a lack of political traction. In particular, Plano's previous attempt to work with a third party to implement micro-mobility options was not successful and makes stakeholders resistant to try again.

### CASE STUDY

#### Try Parking It App

Try Parking It is an alternative commuting program sponsored by the North Central Texas Council of Governments (NCTCOG) for commuters in the Dallas-Fort Worth metropolitan area. Try Parking It offers users a platform to track green commutes, including walking, biking, scootering, public transit rides, and telecommuting, and allows users to accumulate and redeem points in the form of dining, shopping, events, and other rewards. Users can also use the Try Parking It to identify opportunities for carpooling and van pooling.

For more information, visit the Try Parking It page.

# TRANSPORTATION & LAND USE

## TR-2: Promote the electrification of vehicle fleets and private vehicles and expansion of electric vehicle (EV) infrastructure.

**1,138,000** $mtCO_2e$ reduced | **$$$**

Transportation-related activities generate the largest portion of Plano's GHG emissions, mostly from private vehicles. Transitioning to an electric vehicle fleet has the greatest potential to curb overall community emissions.

| Action | Phase | Approach | Lead Organization(s) |
|---|---|---|---|
| Electrify City vehicle fleets. | Near-term | Accelerate the transition to electric vehicles for City fleets where the technology is affordable and appropriate and explore emerging technologies that would be suitable for medium- and heavy-duty vehicles. | Fleet Services |
| Accelerate the transition to electric vehicles. | Near-term | Establish consistent language, messaging, and branding around EVs, and develop an education and outreach campaign to increase public awareness on the benefits of EV technologies. | Sustainability & Environmental Education, Communications & Community Outreach |
| Explore fleet electrification partnership opportunities. | Near-term | Work with large fleet owners, including Plano ISD and large corporations, to create vehicle fleet electrification action plans. Explore opportunities to partner with car-sharing companies to provide electrified shared mobility options to Plano residents. | Sustainability & Environmental Education |
| Promote EV-Ready buildings and adopt "EV-Ready" ordinances where possible. | Near-term | Work with developers to incorporate EV charging infrastructure in higher density multifamily buildings and large mixed-use and commercial developments. Conduct a benchmarking analysis to understand "EV-Ready" ordinances in peer cities in the US, and explore opportunities to enact "EV-Ready" building codes and ordinances in Plano. Ordinance language and implementation should complement any "Solar-Ready" strategies (as described in strategy RE-2). | Planning, Building Inspections |

### Stakeholder Feedback

Starting with the City fleet and expanding to other commercial fleets will demonstrate leadership and create visibility for EV technology. Additionally there seems to be community support for EVs, momentum that should be leveraged to push forward on EV adoption as well as EV infrastructure development.

**Photo:** Getty

# TRANSPORTATION & LAND USE

## TR-3: Work with regional partners to expand mass transit options in Plano.

300,000 $mtCO_2e$ reduced | $$

Moving people away from single occupancy vehicles by providing more public transit opportunities will result in significant avoided emissions and other co-benefits, such as reduced congestion and lower transportation costs.

| Action | Phase | Approach | Lead Organization(s) |
|---|---|---|---|
| Expand the service area for the GoLink on-demand shuttle service. | Near-term | Conduct community transportation needs assessments to identify high potential zones for GoLink services. | Planning, Transportation |
| Encourage state and federal legislative bodies to invest in light rail and bus rapid transit routes and infrastructure. | Long-term | Continue to push for the expansion of DART public transit services in the Plano area and work with regional partners to identify local, state, and federal funds to increase services in the region. | Policy & Government Relations |

### Influencing Transit Ridership

Ridership and service levels can create a negative feedback loop that is difficult to break. A lack of service makes public transportation slower and less reliable which in turn reduces overall ridership. However, ridership is a key metric used to determine levels of service so this reduced ridership often results in even more limited services offerings. To combat this issue, focus on the other elements that influence a resident's decision to use mass transit. Increased amenities at bus station shelters, such as shading or water fountains will increase rider comfort on hot days and make taking the bus more attractive. Or, seek to engage first-time riders by offering free or reduced rate service in partnership with an event such as a fair, festival, or other community gathering.

### Stakeholder Feedback

While there is significant stakeholder interest in expanding mass transit options, this solution lacks internal capability and political traction due to the many parties that would need to be involved to successfully implement this solution. Several barriers include the stigma against public transportation and breaking the cycle whereby a lack of service creates reduced ridership and vice versa.

# TRANSPORTATION & LAND USE

## TR-4: Implement transportation demand management (TDM) strategies to curb vehicle miles travelled.

**158,000** $mtCO_2e$ reduced | **$**

Employing a diversified suite of TDM strategies, including telecommuting, alternative work schedules, and ridesharing, could significantly curb transportation emissions, particularly those from work commutes.

| Action | Phase | Approach | Lead Organization(s) |
|---|---|---|---|
| Deploy transportation demand management (TDM) strategies. | Near-term | Work with City departments and large employers in the Plano area to implement various TDM strategies, including alternative work schedules, remote working, carpooling and vanpooling, and shuttle options. | Sustainability & Environmental Education, Planning, Transportation, Special Projects, Economic Development |


**Image:** LegacyConnect

### Stakeholder Feedback

LegacyConnect is the current TDM provider in Plano and would need to be engaged should this strategy be implemented to expand TDM services. Working with local businesses to promote the acceptance of remote working, flexible work schedules, and condensed work weeks should also be considered.

### CASE STUDY

#### LegacyConnect

LegacyConnect is a non-profit organization dedicated to creating "connections that improve mobility options and promote mobility for employees and others traveling to or from the area." They engage a number of businesses and organizations in Plano, including Boeing, FedEx, Intuit, and Toyota. In honor of Earth Day, the organization published seven principles for sustainable mobility:

- Plan cities and mobility together
- Encourage efficient use of space and assets
- Engage stakeholders in decision making
- Design for equitable access
- Transition toward zero emissions
- Deliver public benefits via open data
- Promote integration and seamless connectivity

For more information, go to LegacyConnect page.

# CLEAN & RENEWABLE ENERGY

## RE-1: Transition the City of Plano's energy portfolio to 100% renewable electricity.

13,000 $mtCO_2e$ reduced | $$

As a large purchaser and user of electricity, the City of Plano can demonstrate leadership by transitioning to a 100% renewable electricity portfolio.

| Action | Phase | Approach | Lead Organization(s) |
|---|---|---|---|
| Purchase Renewable Energy Credits (RECs). | Near-term | Evaluate various REC purchase options to offset municipal electricity use that would have otherwise come from non-renewable sources. | Policy & Government Relations |
| Enter a 100% renewable electricity contract. | Long-term | Assess 100% renewable electricity contract options and enter into an agreement with a utility provider to completely offset City electricity emissions by 2025. | Policy & Government Relations |

### Types of RECs

RECs can come in a variety of shapes and price tags. While every REC represents 1 MWh of renewable electricity, they can vary in quality.

Local, bundled RECs are typically considered the highest caliber. These RECs represent credits for renewable energy that is produced in close proximity to the buyer and because they are bundled (i.e. are sold with the actual renewable energy they are associated with) their purchase supports additional renewable energy being added to the grid. These RECs are also the most expensive, with the price varying by location and technology. However, they are the best way to demonstrate leadership in sustainability without the time and complication of updating existing power contracts.

Other defining characteristics for a REC include technology type, certificate vintage (when the energy was actually produced), and importantly certification. Certification means a REC has gone through a quality assurance program, with Green-e being the most common program in the U.S., that verifies the quality and legitimacy of the REC.

**Photo:** Getty

# CLEAN & RENEWABLE ENERGY

## RE-2: Increase the uptake of and access to non-utility scale renewable energy technologies in the Plano community.

**580,000** $mtCO_2e$ reduced

**$$$**

Innovative non-utility scale renewable programs, particularly those focused on access to local solar, have the potential to offset fossil-fuel energy use and related emissions.

| Action | Phase | Approach | Lead Organization(s) |
|---|---|---|---|
| Promote Solar-Ready homes and buildings. | Near-term | Encourage new home and building construction to include capacity for future solar installations. If Solar-Ready ordinances are adopted, language and implementation should complement any "EV-Ready" strategies (as described in strategy TR-2). | Building Inspections, Planning |
| Increase community access to solar energy technologies. | Near-term | Explore opportunities for community solar farms and other solar cooperatives to increase access to the benefits of solar energy technologies, especially for residents where solar cannot be placed on their property. | Sustainability & Environmental Education |
| Increase residential solar installations. | Long-term | Provide additional incentives for the installation of solar at residences. | Neighborhood Services, Planning |

## CASE STUDY

### Multifamily Shared Solar

Non-utility solar has long been considered a solution only accessible to homeowners, and typically those with higher incomes. Austin Energy is in the process of piloting an innovative rooftop solar solution that will buck this norm and make solar and its cost-saving benefits accessible to all, including residents living in shared multifamily buildings. This solar installation tracks the energy generated by the panels and apportions the resulting credits to individual units, determined by unit size. Whereas it was previously not possible to divide the benefits of a single installation between different electric accounts, the utility has employed its Meter Data Management System to do just that and open the door to a cost-effective multifamily rooftop solar project.

For more information, visit Austin Energy's website.

**Photo:** Austin Energy

# CLEAN & RENEWABLE ENERGY

## RE-3: Increase the percentage of residential, commercial, and industrial users consuming utility-scale renewable electricity in Plano.

**1,420,000** $mtCO_2e$ reduced

**$$-$$$*** 

The City of Plano can use a combination of outreach, partnerships, and buying power to shift residents and businesses to 100% renewable energy plans.

| Action | Phase | Approach | Lead Organization(s) |
|---|---|---|---|
| Increase opt-ins into 100% renewable electricity plans. | Near-term | Develop a campaign to encourage residential, commercial, and industrial utility customers to switch to renewable electricity plans. Work with retail electric providers to expand renewable offerings and increase access to affordable 100% renewable options. | Sustainability & Environmental Education |
| Leverage the City's purchasing power to increase renewable electricity use in Plano. | Long-term | Support local aggregation options or other bulk renewable electricity purchasing strategies for Plano residents and businesses, given available regulatory channels and constraints.<br><br>Continue to assess aggregation and bulk purchasing options as regulatory changes occur at both the state and federal level. | Policy & Government Relations |

### Community Choice Aggregation

Community choice aggregation (CCA) is a strategy that allows governments to pool residential, commercial, and municipal electricity use and procure power on customers' behalf. There is currently enabling legislation in nine states, with several more actively exploring the option. Municipal aggregation can be beneficial in many ways, including the ability to procure renewable energy at a lower cost, supporting local energy programs and jobs, and generating revenue. Structures vary, though many programs include an "opt-out" option for those who do not wish to participate, or an "opt-in" option for residents and businesses who are willing to pay more for certain characteristics, such as electricity coming from local renewable projects.

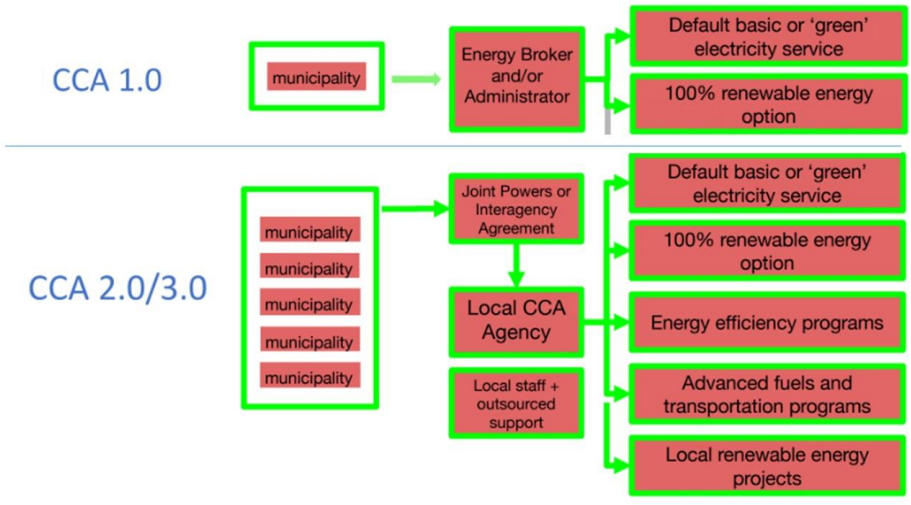



**Figure 5:** Conceptualization of various CCA models. Graphic by LEAN Energy.

*Implementation costs for RE-3 are highly variable given the uncertainty associated with the continuously evolving state and federal policy landscape and ERCOT's future electricity generation mix.

# SUSTAINABLE BUILDINGS

## SB-1: Incentivize advanced energy efficiency standards for new construction and major renovations.

120,000 $mtCO_2e$ reduced | $$

By adopting advanced building codes and wielding financial incentives, the City of Plano can help promote the shift towards Zero Net Energy (ZNE) buildings.

| Action | Phase | Approach | Lead Organization(s) |
|---|---|---|---|
| Leverage public financing agreements to require improved building standards. | Long-term | Require implementation of advanced green building standards for developments seeking to receive tax increment financing (TIF) funding or other public subsidies. | Building Inspections, Planning, Special Projects |
| Develop stronger green building standards for City buildings and City-funded facilities. | Long-term | Strengthen minimum green building standards for new construction of City facilities and buildings receiving funding or financial incentives from the City. | Building Inspections, Planning, Facilities |
| Continually adopt the most advanced IECC building codes. | Long-term | Demonstrate leadership in building codes by continually adopting the most recent update to the IECC code, with the goal of adopting a Zero Net Energy (ZNE) goal for all new buildings and renovations by 2050. | Building Inspections, Planning |

### Stakeholder Feedback

Requiring net-zero compliance for existing buildings, or even for large retrofits, is difficult due to a lack of buy-in and desire by the business community to invest in building upgrades and technologies. The immediate focus should instead be on ensuring that new buildings are built to increasingly higher standards, and supporting the move towards ZNE buildings through complementary financing, education, and resources.

**Photo:** Getty

# SUSTAINABLE BUILDINGS

## SB-2: Increase energy efficiency in existing buildings, including commercial and residential buildings.

1,000,000 $mtCO_2e$ reduced | $$ | Increased data transparency and funding for retrofits and weatherization can reduce energy use from inefficient or aged buildings.

| Action | Phase | Approach | Lead Organization(s) |
|---|---|---|---|
| Utilize a suite of funding mechanisms to improve energy efficiency. | Near-term | Explore energy efficiency and weatherization finance mechanisms, including Property Assessed Clean Energy (PACE) and Warehouse for Energy Efficiency Loans (WHEEL), and others. | Sustainability & Environmental Education, Neighborhood Services |
| Increase building energy data transparency. | Long-term | Increase public access to building energy performance data to target energy efficiency upgrades and programs to buildings with the highest energy-savings potential. | Sustainability & Environmental Education |
| Consider developing a building energy benchmarking and disclosure process. | Long-term | Consider a benchmarking and disclosure process for large commercial, industrial, and multifamily buildings above a certain square footage threshold. | Sustainability & Environmental Education |

### Behavioral Energy Efficiency

While energy efficient technologies such as LED lights, heat pumps, and smart meters can realize significant energy savings in homes and businesses, behavioral approaches are a complementary strategy that can be just as effective. Changing the way end users consumer energy is cost effective, often returning more energy savings per dollar spent than retrofit or rebate programs. Approaches range from time-of-use pricing where electricity is cheaper during times of lower demand, to interactive approaches such as Home Energy Reports, which use apps and online dashboards to track homeowners' energy use, compare them to their neighbors, and even provide custom recommendations for how the household can lower their energy use.

### Stakeholder Feedback

Bringing existing buildings up to an aggressive standard such as net-zero is a difficult endeavor. The immediate focus for this strategy should instead be on energy efficiency measures that have shorter paybacks and other co-benefits, such as reduced maintenance needs.

# WASTE & CONSUMPTION

## WC-1: Reduce organic and food waste and divert organic waste from landfills.

**13,000** $mtCO_2e$ reduced | **$-$$**

The diversion of organic waste from landfills, through composting programs and sustainable consumption practices, can help avoid methane emissions with high warming potential.

| Action | Phase | Approach | Lead Organization(s) |
|---|---|---|---|
| Recognize leaders in composting and organics diversion. | Near-term | Develop a recognition program for corporations with comprehensive composting programs. | Sustainability & Environmental Education, Commercial Recycling |
| Divert organic waste from landscaping. | Near-term | Encourage landscapers to compost yard waste and other organic materials. | Environmental Waste Services |
| Improve City purchasing and waste diversion practices. | Near-term | Continue to educate employees in all City departments on environmental purchasing policies. Increase the availability of dual-waste trash and recycling stations at City facilities to enable clean recycling and reduce contamination. | Sustainability & Environmental, Education, Environmental Waste Services |
| Provide improved guidance for restaurants. | Near-term | Develop improved green purchasing policies and guidelines for restaurants. | Sustainability & Environmental Education, Environmental Waste Services, Environmental Health |
| Develop a public composting and organics diversion program. | Long-term | Consider installation of organics collection bins or drop-off sites in commercial and/or residential areas. | Environmental Waste Services, Commercial Recycling |
| Divert organic waste from restaurants. | Long-term | Require composting and organics collections at food establishments. | Environmental Waste Services, Environmental Health |

### Stakeholder Feedback

Stakeholders expressed concerns regarding the internal capabilities to enact this strategy as well as the political traction of these actions. In the near-term this strategy should focus on behavioral approaches such as education, outreach, and recognition around environmentally-friendly consumption and waste behaviors. These strategies are much lower cost and will build a good foundation to support future, more costly measures, such as widespread organics collection.

Photo: Unsplash

# PROGRESS METRICS

Effective metrics can help the City track and maintain progress towards its greenhouse gas reduction goals. With a handful of guiding metrics, Plano can quickly take a temperature check to ensure programs, policies, and investments are indeed moving the community towards a more sustainable and resilient City.

The following focused metrics are centered on the high-impact mitigation actions described in this section.

| ID | Action Area | Priority Metrics | Scope |
|---|---|---|---|
| TR-1 | Increase carbon-free and active mobility options throughout the city. | Miles of designated bike lanes / protected bike lanes installed | City metric |
| | | Miles of sidewalk installed | |
| TR-2 | Promote the electrification of vehicle fleets and private vehicles and expansion of EV infrastructure. | % of City vehicle fleet electrified | City metric |
| | | # of new publicly-available charging stations installed | |
| TR-3 | Work with regional partners to expand mass transit options in Plano. | # of commuters initiating DART trips within Plano limits | Community metric |
| | | # of transit lines servicing the Plano area (including bus, rail, etc.) | |
| TR-4 | Implement transportation demand management (TDM) strategies to curb vehicle miles travelled. | # of large employers and institutions with a TDM system in place | City metric |
| | | % of City employees participating in TDM programs | |
| RE-1 | Transition the City of Plano's energy portfolio to 100% renewable electricity. | % of City of Plano's electricity coming from renewable sources | City metric |
| | | % of City of Plano's electricity use offset by Renewable Energy Credits (RECs) | |
| RE-2 | Increase the uptake of and access to non-utility scale renewable energy technologies in the Plano community. | MW of renewable capacity at homes and businesses | Community metric |
| | | MW of community renewable capacity, including from community solar | |
| RE-3 | Increase the percentage of residential, commercial, and industrial users consuming utility-scale renewable electricity in Plano. | % of businesses enrolled in renewable electricity plans | Community metric |
| | | % of residents enrolled in renewable electricity plans | |
| SB-1 | Incentivize advanced energy efficiency standards for new construction and major renovations. | # of new buildings achieving a minimum LEED, ENERGY STAR, or other green building standard or score (e.g., Energy Use Intensity (EUI)) | Community metric |
| | | # of new Zero Net Energy (ZNE) buildings | |
| SB-2 | Increase energy efficiency in existing buildings, including commercial and residential buildings. | % reduction in energy use among buildings that have benchmarked/disclosed energy data | Community metric |
| | | # of buildings receiving energy efficiency upgrades or retrofits through City-sponsored programs | |
| WC-1 | Reduce organic and food waste and divert organic waste from landfills. | % or quantity of yard waste diverted from landfills | Community metric |
| | | % or quantity of food waste diverted from landfills | |

# APPENDIX A

# GLOSSARY

Photo: City of Plano

# GLOSSARY

### Adaptation:
The process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects.

### Carbon Neutrality or "Net Zero:"
Having achieved a state in which the net amount of carbon dioxide or other forms of carbon emitted into the atmosphere is reduced to zero because it is balanced by action to reduce or offset these emissions.

### Carbon Sequestration:
Refers to the removal of carbon from the atmosphere or the storage of carbon in biomass or in deep geological formations through natural or technological processes.

### Climate:
The composite or generally prevailing weather conditions of a region averaged over a series of years. Climate in a narrow sense is usually defined as the average weather, or more rigorously, as the statistical description in terms of the mean and variability of relevant atmospheric and meteorological quantities — such as temperature, precipitation, and wind — over a period of time. The classical period for averaging these is 30 years, as defined by the World Meteorological Organization. Climate in a wider sense is the state, including a statistical description, of the climate system.

### Climate Projections:
A climate projection is the simulated response of the climate system to a scenario of future emission or concentration of greenhouse gases and aerosols, generally derived using climate models. Climate projections are distinguished from climate predictions by their dependence on the emission, concentration, and/or radiative-forcing scenario used, which is in turn based on assumptions concerning, for example, future socioeconomic and technological developments that may or may not be realized.

### Community Inventory:
Plano's community inventory encompasses all emissions that occur from activities within the Plano city limits. This includes emissions from building energy use, transportation, solid waste disposal, water and wastewater treatment, and fugitive emissions.

### Global Warming Potentials (GWPs):
A universal unit of measure for GHGs, expressed by relating the global warming impact to one unit of carbon dioxide. Used to evaluate the relative impact of various GHGs.

### Greenhouse Gas Emissions:
Any gaseous compound in the atmosphere capable of absorbing infrared radiation, resulting in trapping and holding heat in the atmosphere.

### Metric Tons $CO_2$ Equivalent ($MTCO_2e$):
A measure used to compare the emissions from various greenhouse gases on the basis of their global warming potential, by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming potential.

### Micro-mobility:
Personal transportation modes that can carry one or two passengers.

### Mitigation:
Measures to reduce the amount and speed of future climate change by reducing emissions of heat-trapping gases or removing carbon dioxide from the atmosphere.

### Municipal Inventory:
Plano's municipal inventory includes emissions from City-related activities and functions, including: city-owned facilities and buildings, city-operated traffic signals and street lights, city-owned vehicles, employee commutes, water pumping, and solid waste facilities

# GLOSSARY

### Resilience:
The capacity of social, economic and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure, while also maintaining the capacity for adaptation, learning and transformation.

### Risk:
Threats to life, health and safety, the environment, economic well-being, and other things of value. Risks are often represented as probability (likelihood) of occurrence of hazardous events or trends multiplied by the impacts (consequence) if these events or trends occur.

### Transportation Demand Management (TDM):
Providing travelers with travel choices, such as work location, route, time of travel, and mode, to improve travel reliability.

### Vulnerability:
The propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements including sensitivity or susceptibility to harm and lack of capacity to cope and adapt.

### Weather:
The state of the atmosphere with respect to wind, temperature, cloudiness, moisture, pressure, etc. Weather refers to these conditions at a given point in time (e.g., today's high temperature), whereas climate refers to the "average" weather conditions for an area over a long period of time (e.g., the average high temperature for today's date).

### Zero Net Energy (ZNE) Buildings:
Buildings that combine energy efficiency and renewable energy generation to consume only as much energy as can be produced by dedicated renewable resources over a specified time period.

# APPENDIX B

# REVIEW OF CITY OF PLANO EXISTING EFFORTS

The City of Plano has developed various policies, programs, and plans to push forward its vision of a sustainable and thriving community. These efforts align with the CARE Strategy and provide the policy backing needed to pursue achievable GHG reduction measures in the community.

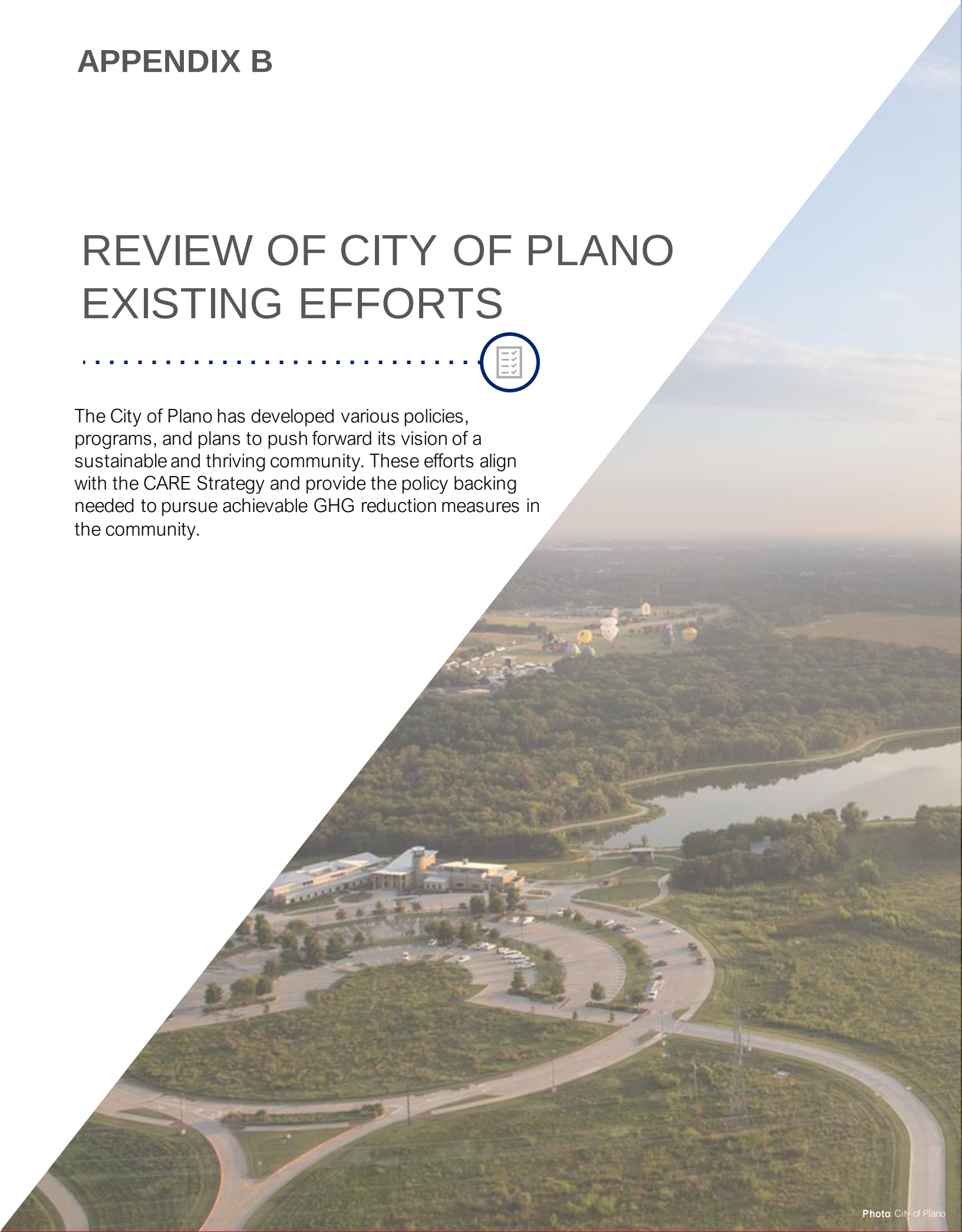


**Photo**: City of Plano

# REVIEW OF CITY OF PLANO EXISTING EFFORTS

Guidehouse analyzed various City of Plano plans, policies, and programs to assess the alignment between existing City efforts and the greenhouse gas reduction and resiliency priorities of the CARE Strategy.

Relevant sustainability and resiliency efforts reviewed for the CARE Strategy include the following:

**Plans**

- City of Plano Comprehensive Plan
- Sustainability Implementation Plan
- Urban Forest Master Plan
- Mobility 2045
- Plano Hazard Mitigation Plan
- Disaster Debris Management Plan

**Policies**

- Sustainable Construction Policy
- Environmental Purchasing Policy
- Energy Policy
- Mobile Source Pollution Policy
- Clean Fleet Policy

**Programs & Initiatives**

- CDP Submission
- STAR Communities
- Renewable Electricity Campaign
- LED Energy Efficiency Campaign
- EPA Green Power Partnership
- SolSmart Designation

The efforts summarized below feature levers and tools at the City's disposal to drive emission reductions and build resiliency. The City of Plano Comprehensive Plan outlines a vision for development that includes green buildings, improved land use practices, and sustainable mobility options. The Sustainability Implementation Plan, Urban Forest Master Plan, and STAR Communities Assessment provide additional guidance on specific sustainability goals and opportunities for City operations and the community at-large, many of which are the focus of the CARE Strategy. Finally, the City's suite of internal sustainability policies provides guidelines to City departments around sustainable purchasing, energy consumption, construction, and vehicle fleets and can be expanded upon to include additional community actors.

## City of Plano Comprehensive Plan

The City of Plano Comprehensive Plan guides planning, development, and growth in the city and focuses on critical aspects of Plano's built environment with the potential to significantly impact carbon emissions and resilience. The City of Plano Comprehensive Plan is centered around five key pillars, each of which offer either direct or indirect emissions reduction and resiliency benefits:

- **Built environment:** Land use policies, transit-oriented development, bicycle, public transit, pedestrian, and TDM policies.
- **Social environment:** Facilities and infrastructure, emergency management, parks and recreation.
- **Natural environment:** Building and development design, water conservation, renewable energy, stormwater management.
- **Economic environment:** Diverse and resilient economy, jobs and workforce development.
- **Regionalism:** Air quality, regional transportation and water conservation policies, inter-city cooperation.

# REVIEW OF CITY OF PLANO EXISTING EFFORTS

## STAR Communities Assessment

Plano's STAR Communities assessment revealed opportunities for improvement in the following key categories:

- **Climate and Energy:** Gaps related to climate adaptation, clean energy supply, the industrial sector, resource efficient buildings and public infrastructure.
- **Equity and Empowerment:** Gaps related to environmental justice, equitable services, civil and human rights programs, and poverty prevention.

The STAR Communities framework can be used as an iterative assessment tool to determine areas where additional action is needed and to continually improve Plano's overall sustainability performance.

## Sustainability Implementation Plan

The Sustainability Implementation Plan ("SIP") outlines an overarching sustainability strategy for the City of Plano, describing measurable goals, objectives, and actions that align City efforts around sustainability. The SIP focuses on four key levels of sustainability action:

**Local efforts:** Including both internal and external sustainability efforts.

**Regional involvement:** Regional collaborative initiatives, including the Sustainability Stewardship Forum, and various committees and roundtables within NCTCOG.

**Statewide involvement:** Statewide collaborative initiatives, including PACE, SPEER, Texas Sustainability Peer Learning Exchange, and the Texas Product Stewardship Council.

**National involvement:** National-level initiatives, including STAR Communities and USDN User Groups.

The SIP provides a strong foundation for the coordination of sustainability initiatives and can also guide the development and prioritization of new measures more specifically tied to emissions reduction and resilience.

## Urban Forest Master Plan

The Urban Forest Master Plan ("UFMP") specifies goals and related actions to manage, improve, and increase the urban tree canopy in the City of Plano. The UFMP recognizes the value of the urban forest in mitigating urban heat island, improving air and water quality, managing stormwater, decreasing energy costs, and capturing carbon from the atmosphere.

## Internal Sustainability Policies

### Environmental Purchasing Policy

The Environmental Purchasing Policy outlines environmental, economic, and social factors to be incorporated into the City of Plano's purchasing decisions.

### Energy Policy

The Energy Policy is designed to reduce energy consumption in municipal facilities through energy management and energy-efficient technology.

### Sustainable Construction Policy

The Sustainable Construction Policy is an internal municipal policy to ensure new construction and major remodels of city-owned buildings are consistent with green building practices.

### Mobile Source Reduction Policy

The Mobile Source Pollution Reduction Policy addresses the major contributing factors to mobile emissions, including vehicle cold starts, vehicle idling, hard accelerations, high-emitting vehicles, and diesel engines, and aims to mitigate the impact of the City's vehicle fleet on the environment.

### Clean Fleet Policy

The Clean Fleet Policy aims to reduce emissions and overall fuel use resulting from the operation of City fleet vehicles. It requires the strategic replacement of fossil fuel vehicles with alternative fuel and/or electric vehicles and supports anti-idling policies.

# REVIEW OF CITY OF PLANO EXISTING EFFORTS

## Mapping of Existing City Efforts and CARE Strategy Priorities

| PLAN OR POLICY | Clean & Renewable Energy | Sustainable Buildings | Transportation & Land Use | Consumption & Waste | Green Infrastructure | Resilience | Equity |
|---|---|---|---|---|---|---|---|
| City of Plano Comprehensive Plan | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Sustainability Implementation Plan & Indicators | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Mobility 2045 (NCTCOG) | | ■ | ■ | | ■ | ■ | ■ |
| Plano Hazard Mitigation Plan | | | | | | ■ | ■ |
| Disaster Debris Management Plan | | | | ■ | | ■ | |
| STAR Communities | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| CDP Submission | ■ | ■ | ■ | ■ | ■ | ■ | |
| Urban Forest Master Plan | | | ■ | | ■ | ■ | ■ |
| Sustainable Construction Policy | ■ | ■ | | ■ | | ■ | |
| Environmental Purchasing Policy | ■ | | | ■ | | ■ | ■ |
| Energy Policy | ■ | ■ | | | | | |
| Mobile Source Pollution Reduction Policy | | | ■ | | | | |
| Clean Fleet Policy | | | ■ | ■ | | | |
| Renewable Electricity Campaign | ■ | | | | | | |
| LED Energy Efficiency Campaign | | ■ | | | | | |
| EPA Green Power Partnership | ■ | | | | | | |
| SolSmart Designation | ■ | ■ | | | | ■ | |

**Legend:**

■ Strong alignment with emissions reduction and resiliency priorities.

■ Limited or secondary alignment with emissions reduction and resiliency priorities.

□ No clear connection to emissions reduction or resilience.

# APPENDIX C

# COMPLETE LIST OF OPPORTUNITIES

Through the CARE Strategy development process, a diverse suite of mitigation and adaptation opportunities was identified by City and community stakeholders. These ideas are captured in the following section for further exploration by the City. The actions outlined here represent possible options for further GHG emissions reductions and resiliency measures that the City should consider implementing to complement the high-potential actions described in the CARE Strategy.

**Photo**: City of Plano

# LIST OF OPPORTUNITIES

## Mitigation Opportunities

| Theme | # | Strategy | Actions |
|---|---|---|---|
| Clean and Renewable Energy | 1 | Transition the City of Plano's energy portfolio to 100% renewable electricity. | Purchase Renewable Energy Credits (RECs). |
| | 2 | | Enter a 100% renewable electricity contract. |
| | 3 | Increase the uptake of and access to non-utility renewable energy technologies in the Plano community. | Provide additional incentives for the installation of solar at residences. |
| | 4 | | Encourage new home and building construction to include capacity for future solar installations. If Solar-Ready ordinances are adopted, language and implementation should complement any "EV-Ready" strategies (as described in strategy TR-2). |
| | 5 | | Explore opportunities for community solar farms and other solar cooperatives to increase access to the benefits of solar energy technologies. |
| | 6 | Increase the percentage of residential, commercial, and industrial users consuming utility-scale renewable electricity in Plano. | Develop a campaign to encourage utility customers to switch to renewable electricity plans. Work with retail electric providers to expand renewable offerings and increase access to affordable 100% renewable options. |
| | 7 | | Support local aggregation options or other bulk renewable electricity purchasing strategies for Plano residents and businesses, given available regulatory channels/constraints. |
| | 8 | Minimize dependency on natural gas and reduce emissions associated with natural gas usage. | Promote fuel switching from natural gas to electric and provide incentives to retrofit and electrify existing homes and buildings. |
| | 9 | | Evaluate options for increasing natural gas system leak detection and reduction. |
| | 10 | Support and incentivize district-scale clean energy projects that harness renewable and waste energy at large-scales. | |
| Sustainable Buildings | 11 | Incentivize advanced energy efficiency standards for new construction and major renovations. | Require implementation of advanced green building standards for developments seeking to receive TIF funding or other public subsidies. |
| | 12 | | Demonstrate leadership in building codes by continually adopting the most recent update to the IECC code, with the goal of adopting a Zero Net Energy (ZNE) goal for all new buildings and renovations. |
| | 13 | | Strengthen minimum green building standards for new construction of City facilities and buildings receiving funding or financial incentives from the City. |
| | 14 | Increase energy efficiency in City buildings. | Convert all City-operated lighting to LED where possible. |

# LIST OF OPPORTUNITIES

## Mitigation Opportunities

| Scope | Implementation Partners | | | | Related Policy or Plan |
|---|---|---|---|---|---|
| | City of Plano | Community | Business | Other Stakeholders | |
| Municipal | X | | | | City of Plano Comprehensive Plan |
| Municipal | X | | | | City of Plano Comprehensive Plan |
| Community | X | X | X | | City of Plano Comprehensive Plan |
| Community | X | X | X | Developers | |
| Community | X | X | | | |
| Community | X | X | X | | |
| Community | X | X | X | | |
| Community | X | X | X | | |
| Community | X | | | | |
| Community | X | | X | | |
| Community | X | | X | | |
| Community | X | X | X | | City of Plano Comprehensive Plan |
| Municipal | X | X | X | | |
| Municipal | X | | | | |

# LIST OF OPPORTUNITIES

## Mitigation Opportunities

| Theme | # | Strategy | Actions |
|---|---|---|---|
| Sustainable Buildings | 15 | Increase energy efficiency in existing buildings, including commercial and residential buildings. | Consider a benchmarking and disclosure process for large commercial, industrial, and multifamily buildings above a certain square footage threshold. |
| | 16 | | Increase public access to building energy performance data to target energy efficiency upgrades and programs to buildings with the highest energy-savings potential. |
| | 17 | | Explore energy efficiency and weatherization finance mechanisms, including Property Assessed Clean Energy (PACE) and Warehouse for Energy Efficiency Loans (WHEEL), and others. |
| | 18 | | Deploy additional energy efficiency programs and rebates in partnership with local utility providers. |
| Transportation and Land Use | 19 | Increase carbon-free and active mobility options throughout the city. | Deploy funding to address known gaps in bicycle infrastructure and develop a bicycle master plan to guide future investments. |
| | 20 | | Work with e-scooter and other micro-mobility companies to identify high use zones where designated travel lanes would be beneficial. |
| | 21 | | Assess the City's current expenditures on transportation infrastructure by mode type to address gaps in funding for programs and infrastructure that support alternative transportation modes. |
| | 22 | | Implement the City of Plano Comprehensive Plan policies to ensure future development prioritizes compact walkable communities over sprawl. |
| | 23 | Implement transportation demand management (TDM) strategies to curb vehicle miles travelled. | Deploy transportation demand management (TDM) strategies by working with City departments and large employers in the Plano area. |
| | 24 | Work with regional partners to expand mass transit options in Plano. | Encourage state and federal legislative bodies to invest in light rail and bus rapid transit routes and infrastructure. |
| | 25 | | Expand the service area for the GoLink on-demand shuttle service. |
| | 26 | Promote the electrification of vehicle fleets and private vehicles and expansion of electric vehicle infrastructure throughout the city. | Work with City departments to electrify vehicle fleets where appropriate. |
| | 27 | | Establish consistent language, messaging, and branding around EVs, and develop an outreach campaign to increase awareness on the benefits of EV technologies. |
| | 28 | | Explore electrification partnership opportunities (e.g., electrify PISD school fleets). |

# LIST OF OPPORTUNITIES

## Mitigation Opportunities

| Scope | Implementation Partners | | | | Related Policy or Plan |
|---|---|---|---|---|---|
| | City of Plano | Community | Business | Other Stakeholders | |
| Community | X | X | X | | |
| Community | X | X | X | | |
| Community | X | X | X | | Sustainability Implementation Plan |
| Community | X | X | X | Utility providers | |
| Community | X | | | | City of Plano Comprehensive Plan, Sustainability Implementation Plan |
| Community | X | | | | |
| Community | X | | | | City of Plano Comprehensive Plan, Sustainability Implementation Plan |
| Community | X | | | Developers | City of Plano Comprehensive Plan |
| Community | X | X | X | | City of Plano Comprehensive Plan |
| Community | X | X | X | DART | City of Plano Comprehensive Plan |
| Community | X | X | X | DART | |
| Municipal | X | | | | City of Plano Comprehensive Plan |
| Community | X | X | | Dealerships | |
| Community | X | X | X | School districts | |

# LIST OF OPPORTUNITIES

## Mitigation Opportunities

| Theme | # | Strategy | Actions |
|---|---|---|---|
| Transportation & Land Use | 29 | | Promote EV-ready buildings by providing incentives to developments above a certain square footage or occupant threshold to include capacity for EV charging infrastructure and adopt "EV-Ready" ordinances where possible. |
| | 30 | Explore clean fuel options for vehicles that cannot yet be electrified, including CNG and clean diesel, and promote replacement of older, inefficient vehicles with newer, higher efficiency vehicles. | |
| | 31 | Adopt anti-idling policies to reduce emissions related to the non-efficient use of vehicles. | |
| Waste & Consumption | 32 | Reduce organic and food waste and divert organic waste from landfills. | Invest in depackagers to increase the amount of food material that can be composted. |
| | 33 | | Require composting and organics collections at food establishments. |
| | 34 | | Develop a recognition program for corporations with comprehensive composting programs. |
| | 35 | | Encourage landscapers to compost yard waste and other organic materials. |
| | 36 | | Consider installation of organics collection bins or drop-off sites in commercial and/or residential areas. |
| | 37 | | Continue to educate employees in all City departments on environmental purchasing policies. Increase the availability of dual-waste trash and recycling stations at City facilities to enable clean recycling and reduce contamination. |
| | 38 | | Develop improved green purchasing policies and guidelines for restaurants. |
| | 39 | Expand the reach of the City's recycling program. | Provide recycling receptacles in highly-trafficked commercial and residential areas. |
| | 40 | | Require limited recycling (e.g., plastic bottles, paper, cardboard) for multifamily properties. |
| | 41 | | Work with stakeholders to develop a phased Universal Recycling Ordinance with a goal of achieving zero waste by 2050. |
| | 42 | Increase the use of reusable materials and discourage the use of single-use, non-biodegradable materials. | Work with schools and large corporate campuses to eliminate the use of Styrofoam. |

# LIST OF OPPORTUNITIES

## Mitigation Opportunities

| Scope | Implementation Partners | | | | Related Policy or Plan |
|---|---|---|---|---|---|
| | City of Plano | Community | Business | Other Stakeholders | |
| Community | X | X | X | Developers | City of Plano Comprehensive Plan |
| Community | X | X | X | NCTCOG, County | City of Plano Comprehensive Plan |
| Community | X | | | | City of Plano Comprehensive Plan |
| Community | X | | | | |
| Community | X | X | X | | City of Plano Comprehensive Plan |
| Community | X | | X | | City of Plano Comprehensive Plan |
| Community | X | | X | | |
| Community | X | X | X | | City of Plano Comprehensive Plan |
| Municipal | X | | | | |
| Community | X | | X | | |
| Community | X | X | X | | City of Plano Comprehensive Plan |
| Community | X | X | | Multifamily property owners | City of Plano Comprehensive Plan |
| Community | X | X | X | | City of Plano Comprehensive Plan |
| Community | X | | X | School districts | |

# LIST OF OPPORTUNITIES

## Mitigation Opportunities

| Theme | # | Strategy | Actions |
|---|---|---|---|
| Waste & Consumption | 43 | Encourage more environmentally-friendly consumption and waste behaviors. | Continue and expand "pay as you throw" waste collection structure for residential customers. |
| | 44 | | Provide more favorable waste collection rates for residents who opt into residential recycling programs. |
| | 45 | | Reduce waste collections to once a week and increase collection frequency for recycling and organics. |
| | 46 | | Explore "smart" waste collection strategies and technologies to only provide collection services when needed. |
| | 47 | | Adopt mandatory City procurement specifications for materials reuse, reduced packaging, products with low embodied energy, materials with recycled content, and locally manufactured products. |
| Green Infrastructure | 48 | Pursue aggressive tree canopy expansion goals and implement strategies identified in the Urban Forest Master Plan. | |
| | 49 | Encourage replacement of traditional grey infrastructure and impervious surfaces with green infrastructure when possible. | |
| | 50 | Deploy various urban heat island reduction strategies with building efficiency, clean energy, and ecological co-benefits. | Install PV-equipped solar canopies, pavilions, roofs, and other heat reduction and shade structures on City properties and in public spaces. |
| | 51 | | Install green roofs on City buildings and explore incentives for green roofs on large commercial or residential properties. |
| | 52 | | Explore the creation of a "functional green" points system that integrates ecosystem-based strategies and landscape elements that could be incorporated into site development requirements related to impervious surface limits, stormwater management, and green space minimums. |
| | 53 | | Develop carbon sequestration goals and implement ecosystem-based strategies and technological solutions to achieve these goals. |
| Other | 54 | Develop a comprehensive education platform that crosses socio-economic classes and informs residents about GHG-related topics and helps develop a workforce prepared for a green economy. | |

# LIST OF OPPORTUNITIES

## Mitigation Opportunities

| Scope | Implementation Partners | | | | Related Policy or Plan |
|---|---|---|---|---|---|
| | City of Plano | Community | Business | Other Stakeholders | |
| Community | X | X | X | | |
| Community | X | X | | | |
| Community | X | X | | | |
| Community | X | X | X | | |
| Municipal | X | | | | Environmental Purchasing Policy |
| Community | X | X | X | | Urban Forest Master Plan |
| Community | X | | | | City of Plano Comprehensive Plan |
| Municipal | X | | | | City of Plano Comprehensive Plan |
| Municipal | X | X | X | | City of Plano Comprehensive Plan |
| Community | X | X | X | | |
| Community | X | X | X | | |
| Community | X | X | X | Schools and academic institutions | Sustainability Implementation Plan |

# LIST OF OPPORTUNITIES

## Resilience Opportunities

| Theme | # | Strategy | Actions |
|---|---|---|---|
| Infrastructure Resilience | 1 | Harden City-owned infrastructure and assets against the impacts of extreme weather and climate hazards. | Install extreme-weather-resistant solar carports at City fleet parking facilities to protect vehicles from hailstorm impacts and expand renewable generation infrastructure. |
| | 2 | | Install hail guards for HVAC systems at municipal buildings. |
| | 3 | | Separate drip irrigation from overall irrigation systems to maintain soil moisture around building foundations and prevent foundation damages from expansion of soils. |
| | 4 | | Install permeable pavements at City facilities where appropriate, including in parking lots. |
| | 5 | Develop incentives and strengthen standards and requirements, where possible, to improve the resiliency of residential and commercial sites and buildings. | Explore opportunities to strengthen residential and commercial site development standards to include resiliency measures, such as pervious parking or other innovative stormwater infrastructure. |
| | 6 | | Develop an incentive program to encourage builders and developers to construct new buildings above 2018 IECC requirements, specifically when it comes to severe storm, tornado, and heat resiliency measures. |
| | 7 | | Assess viability of various retrofit programs or incentives to increase the resiliency of existing buildings. |
| | 8 | Prioritize building and home energy efficiency upgrades and other financial and educational strategies to reduce utility cost burden. | Incentivize projects that include energy efficiency upgrades for funding through the Great Update Rebate Program. |
| | 9 | | Increase energy efficiency assistance for homeowners, landlords, and tenants seeking building renovation opportunities through partnerships with non-profits, local utility providers, and other key stakeholders. |
| | 10 | | Develop a unified utility cost assistance portal cataloging the various energy efficiency and building retrofit programs available to Plano residents through utility providers or public agencies. |

# LIST OF OPPORTUNITIES

## Resilience Opportunities

| Hazards | Implementation Partners | | | | Related Policy or Plan |
|---|---|---|---|---|---|
| | City of Plano | Community | Business | Other Stakeholders | |
| Severe storms | X | | | | |
| Severe storms | X | | | | |
| Drought | X | | | | |
| Flooding | X | | | | City of Plano Comprehensive Plan |
| Severe storms, drought, flooding, heat | X | X | X | | City of Plano Comprehensive Plan |
| Severe storms, heat | X | | X | | City of Plano Comprehensive Plan |
| Severe storms, drought, flooding, heat | X | X | X | | City of Plano Comprehensive Plan |
| Heat | | | | | |
| Heat | X | X | X | Utility providers | City of Plano Comprehensive Plan |
| Heat | X | X | | Utility providers | |

# LIST OF OPPORTUNITIES

## Resilience Opportunities

| Theme | # | Strategy | Actions |
|---|---|---|---|
| Public Health | 11 | Increase monitoring and understanding of extreme heat and air quality related health impacts and improve reporting, data-sharing, and coordination among local, regional, and national health agencies and organizations. | |
| | 12 | Dedicate public health and outreach resources for vulnerable groups to avoid detrimental health impacts related to extreme weather and climate hazards. | In collaboration with local health agencies and non-profits, open a Day Resource Center to provide critical services (e.g., case management, transitional housing, healthcare, social services) to individuals experiencing homelessness and other vulnerable or marginalized groups. Use the Day Resource Center as a home base to provide additional support services during extreme heat or cold days. |
| | 13 | | Evaluate work schedules, training, and safety policies for City of Plano employees who primarily work outdoors, and establish cross-departmental best practices to reduce risks related to extreme heat, poor air quality, and severe weather. |
| | 14 | | Increase public health outreach and awareness campaigns to address work-related health and safety concerns tied to extreme heat, poor air quality, and severe weather. |
| | 15 | Increase vector control and vector-borne disease prevention in light of changing conditions that threaten the expansion of emerging vector-borne diseases. | Provide free insect repellents and other vector-borne disease prevention services to vulnerable populations during mosquito season. |
| | 16 | | Increase vector control activities and enforcement capabilities (e.g., stagnant water, litter). |
| | 17 | Reduce the effects of extreme heat and urban heat island (UHI) on public health and quality of life outcomes. | Incorporate additional cooling features at parks and public spaces (e.g., shade structures, water features, cooling centers) to provide relief from extreme heat impacts. |
| | 18 | | Assess gaps in the availability of public water fountains and develop a plan to install additional fountains in areas of high need. |
| | 19 | | Increase the number of cooling stations available to the general public during extreme heat days and widely publicize the availability of these locations. |
| | 20 | Improve outdoor air quality and reduce air quality impacts on public health through various pollution prevention and mitigation strategies. | Explore emerging air pollution control and mitigation technologies (e.g., pollution-absorbing paint, air-cleansing structures, carbon sequestration technologies, biomimicry strategies) to address public health and outdoor air quality issues. |
| | 21 | | Continue to explore anti-idling policies, enforcement mechanisms, and other strategies to reduce direct emissions of pollutants affecting local air quality. |

# LIST OF OPPORTUNITIES

## Resilience Opportunities

| Hazards | Implementation Partners | | | | Related Policy or Plan |
|---|---|---|---|---|---|
| | City of Plano | Community | Business | Other Stakeholders | |
| Drought, heat | X | X | | County agencies, healthcare providers, hospitals, etc. | |
| Severe storms, flooding, heat | X | X | | Non-profits, health organizations, etc. | |
| Severe storms, flooding, heat | X | | | | Hazard Mitigation Plan |
| Severe storms, flooding, heat | X | X | X | | |
| Flooding, drought, heat | X | X | X | | |
| Flooding, drought, heat | X | X | X | | City of Plano Comprehensive Plan |
| Heat | X | | X | | |
| Heat | X | | X | | |
| Heat | X | | | | |
| Drought, heat | X | | X | | |
| Drought, heat | X | X | X | | City of Plano Comprehensive Plan, Sustainability Implementation Plan |

# LIST OF OPPORTUNITIES

## Resilience Opportunities

| Theme | # | Strategy | Actions |
|---|---|---|---|
| Disaster Preparedness | 22 | Increase disaster preparedness, response, and recovery focus on seniors, homebound individuals, and other isolated groups. | Develop a pilot "Adopt-a-Senior" program to match isolated elderly residents with a neighbor and strengthen social support and disaster safety networks among vulnerable residents. |
| | 23 | | Create a registry of homebound individuals and other vulnerable residents to identify special emergency response needs and resources. |
| | 24 | | Incorporate the identification of homebound individuals for inclusion in a registry as a certification requirement for Plano's BEST Neighborhoods program. |
| | 25 | Strengthen community-based disaster preparedness and outreach. | Increase participation in the Community Emergency Response Team (CERT) program through new community engagement and outreach strategies with a focus on neighborhood-level preparedness. |
| | 26 | | Design and pilot a Small Business Preparedness Program to address business continuity planning, insurance needs, building retrofit options, and other resiliency strategies. |
| | 27 | | Develop an outreach campaign targeting organizations and facilities that serve vulnerable populations (e.g., low-income groups, homeless, disabled, elderly, isolated, etc.) to identify preparedness gaps and increase resiliency activities. |
| | 28 | Ensure local critical infrastructure sites and facilities are prepared for extreme weather and other disasters. | Develop an outreach campaign targeting large industrial and manufacturing facilities with potentially hazardous materials on site to identify preparedness gaps and increase resiliency activities. |
| | 29 | | Identify local critical infrastructure sites (as defined by the U.S. Department of Homeland Security) and conduct site vulnerability assessments in partnership with site operators and emergency management officials. |

# LIST OF OPPORTUNITIES

## Resilience Opportunities

| Hazards | Implementation Partners | | | | Related Policy or Plan |
|---|---|---|---|---|---|
| | City of Plano | Community | Business | Other Stakeholders | |
| Severe storms, flooding, heat | X | X | | | |
| Severe storms, flooding, heat | X | X | | | Hazard Mitigation Plan |
| Severe storms, flooding, heat | X | X | | | |
| Severe storms, flooding, drought, heat | X | X | | | City of Plano Comprehensive Plan; Hazard Mitigation Plan |
| Severe storms, flooding, drought, heat | X | | X | | |
| Severe storms, flooding, drought, heat | X | X | X | Hospitals, clinics, shelters, non-profits, etc. | Hazard Mitigation Plan |
| Severe storms, flooding, drought, heat | X | | X | | Hazard Mitigation Plan |
| Severe storms, flooding, drought, heat | X | | X | Utility providers, hospitals, telecoms, etc. | Hazard Mitigation Plan |

# LIST OF OPPORTUNITIES

## Resilience Opportunities

| Theme | # | Strategy | Actions |
|---|---|---|---|
| Green Infrastructure & Ecosystem Protection | 30 | Implement green infrastructure strategies designed to mitigate heat, stormwater, and other extreme weather impacts on City properties, in public spaces, and in the ROW. | Increase the planting of drought-tolerant landscaping and trees in the Right-of-Way, at City properties, and in public spaces. |
| | 31 | | Strategically deploy the Neighborwoods program to increase urban tree canopy coverage, specifically in those neighborhoods with the least amount of tree coverage. |
| | 32 | | Prioritize funding for trail improvements and creek armoring gabions on eroding creek beds. |
| | 33 | Develop incentives and strengthen standards and requirements, where possible, to amplify the deployment of green infrastructure technologies and strategies on residential and commercial sites and buildings. | Develop a Green Infrastructure Guide for contractors and developers and provide educational workshops to promote the deployment of green infrastructure strategies in development. |
| | 34 | | Use green infrastructure as a negotiating tool when developers or residents ask for zoning or code variances. |
| | 35 | | Explore opportunities to strengthen residential and commercial site development standards to include green infrastructure measures, such as green roofs or drought-tolerant plantings. |
| Cross-Cutting Strategies | 36 | Increase education, outreach, and engagement with Plano residents on extreme weather and climate hazards. | |
| | 37 | Participate in regional, national, and international peer groups, networks, and partnerships to continue identifying opportunities to integrate resiliency best practices into local planning efforts. | Partner with local research institutions to develop localized climate projections for the Plano area that could be used to inform future vulnerability and risk assessments. |
| | 38 | | Work with the North Texas Municipal Water District (NTMWD) to periodically assess weather- and climate-related risks and identify joint strategies to mitigate impacts to water supplies. |
| | 39 | | Work with local utility providers to assess weather- and climate-related risks and identify joint strategies to mitigate impacts to energy infrastructure. |
| | 40 | | Work with regional transportation stakeholders (NCTCOG, DART, TxDOT) to assess transportation vulnerabilities and identify critical transportation infrastructure with the highest risk of damage or disruption from weather- and climate-related hazards. |

# LIST OF OPPORTUNITIES

## Resilience Opportunities

| Hazards | Implementation Partners | | | | Related Policy or Plan |
|---|---|---|---|---|---|
| | City of Plano | Community | Business | Other Stakeholders | |
| Drought, heat | X | X | X | | |
| Flooding, heat | X | X | | | |
| Flooding | X | | | | |
| Severe storms, drought, flooding, heat | X | | X | | |
| Severe storms, drought, flooding, heat | X | | X | | |
| Severe storms, drought, flooding, heat | X | X | X | | City of Plano Comprehensive Plan |
| Severe storms, drought, flooding, heat | X | X | X | | City of Plano Comprehensive Plan; Hazard Mitigation Plan |
| Severe storms, drought, flooding, heat | X | | | Academic and research institutions | Sustainability Implementation Plan |
| Severe storms, drought, flooding, heat | X | | | NTMWD, NCTCOG | City of Plano Comprehensive Plan, Sustainability Implementation Plan |
| Severe storms, drought, flooding, heat | X | | | Utility providers, ERCOT, NCTCOG | Sustainability Implementation Plan |
| Severe storms, drought, flooding, heat | X | | | NCTCOG, DART, TxDOT | Sustainability Implementation Plan |

# GHG EMISSIONS REDUCTION OPPORTUNITIES

## An Aggressive Scenario

The example aggressive scenario presented in the "GHG Emissions Reduction Opportunities" section uses the potential reductions listed in Table 3 as inputs. These reduction potentials represent the percentage of relevant emissions each strategy reduces. For example, walkability reduces transportation & land use related emissions by 5%, energy efficiency upgrades, retrofits, and weatherization reduces building-related emissions by 50%, and renewables reduce 100% of the City's municipal emissions.

**Table 3:** Example Inputs for an Aggressive GHG Reduction Scenario

| Example "Aggressive" Scenario | | |
|---|---|---|
| Category | Strategy | GHG Reduction Potential |
| Transportation & Land Use | Walkability | 5% |
| | Bike Infrastructure | 5% |
| | Vehicle Electrification | 75% |
| | Mass Transit | 2% |
| | Micro-mobility | 3% |
| | Ridesharing | 3% |
| | Transportation Demand Management (TDM) | 6% |
| | City Electric Vehicles | 100% |
| | Net Zero Buildings | 6% |
| Sustainable Buildings | City Green Buildings | 6% |
| | Energy Efficiency Upgrades, Retrofits, and Weatherization | 50% |
| | Rooftop and Community Solar | 10% |
| Clean & Renewable Energy | Utility-Scale Renewable Energy Procurement | 32% |
| | City Renewable Portfolio | 100% |
| | Composting | 10% |

**Source**: Guidehouse analysis

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Photo: City of Plano

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