

Audit Report

City Efforts to Reduce Carbon Emissions

January 2020



The City of Austin has made considerable efforts to reduce the community's carbon emissions. Austin Energy, a City-owned electric utility, is on track to meet or even exceed its goal of generating 65% renewable energy by 2027. Austin Energy is making progress to stop energy generation from its power plants that emit large amounts of carbon. The City is also working to help the community reduce transportation emissions. However, it is unclear if the City will reduce transportation emissions enough to meet its goal for a carbon-neutral community by 2050. The City can do more to promote electric vehicles to advance the community's progress toward carbon neutrality.

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Objective

How effective are the City's efforts to reduce community-wide carbon emissions from energy generation and transportation?

Background

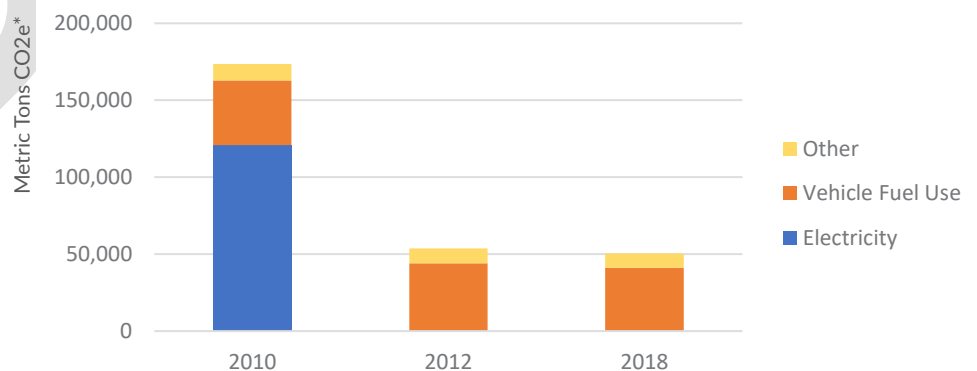
Governments, businesses, non-profits, and individuals worldwide are working to reduce carbon emissions. Carbon emissions contribute to global warming and climate change, leading to higher temperatures and more extreme weather events around the world. Carbon emissions come from many different sources. Power plants, gas-powered cars, and trash in landfills are some sources of carbon emissions.

Many peer cities are working toward a 2050 carbon-neutral community. See the appendix for a comparison of peer cities' community-wide carbon reduction goals.

In August 2019, City Council declared a climate emergency. Part of the City of Austin's strategy to address the climate emergency is to reduce carbon emissions. The City has two carbon-reduction goals. The first goal is for municipal operations to be carbon neutral by 2020. The second goal is for the Austin community to be carbon neutral by 2050.¹

The City has made progress toward achieving carbon-neutral municipal operations by 2020. Municipal carbon emissions dropped significantly in 2011 and 2012 because the City switched to 100% renewable energy for City operations. Additionally, the City is on track to meet its goals to electrify some of the City's vehicles by 2020.

Exhibit 1: The City of Austin's municipal emissions decreased after 2010 due to switching to renewable energy



*CO2e signifies carbon dioxide equivalent, which is used to compare emissions from various greenhouse gases based on their global warming potential.

SOURCE: Office of the City Auditor's analysis of Office of Sustainability data, October 2019

¹ The Austin community is defined as Travis County for the purposes of reporting community-wide emissions.

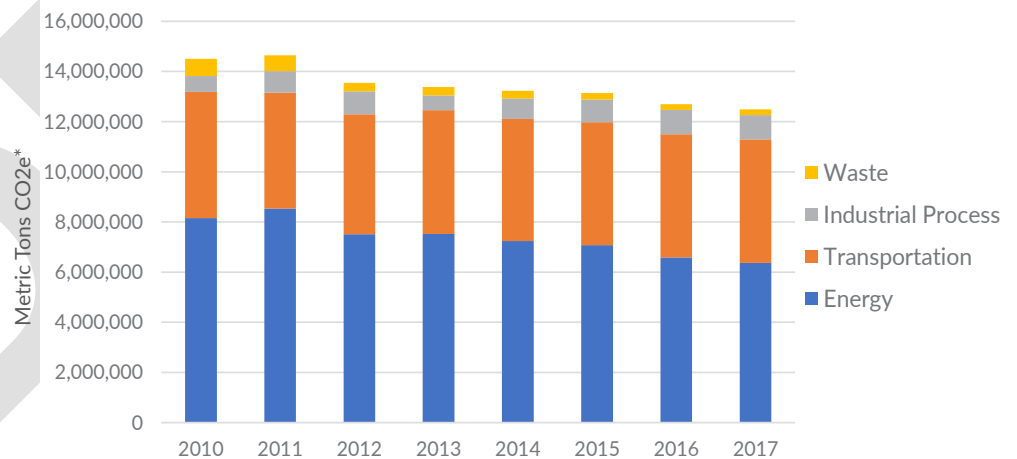
The Office of Sustainability is exploring options to buy carbon offsets to account for the remaining municipal emissions to meet the 2020 goal. Carbon offsets are purchased to cancel out an organization's emissions instead of directly reducing them. An organization can contribute money to efforts that reduce carbon emissions elsewhere and then apply this reduction to its own emissions. The Office of Sustainability estimates the carbon offsets needed to cover the remaining municipal carbon emissions will cost between \$200,000 and \$500,000 this year.

However, municipal carbon emissions are less than one percent of the community's emissions. The more challenging goal is to be a carbon-neutral community by 2050.

The Austin Community Climate Plan directs the City's efforts to become a carbon-neutral community by 2050. There are also other City plans that include efforts to reduce carbon emissions from particular areas, such as energy generation and transportation. The Austin Community Climate Plan helps to align these other City plans in an overall effort to become carbon neutral.

The Office of Sustainability leads efforts to create and update the Austin Community Climate Plan. The Office of Sustainability also reports data and conducts analyses that provide information for long-term planning. The Office of Sustainability reported that the community's estimated carbon emissions were 12,500,000 metric tons in 2017. Energy and transportation emissions made up 90% of that total.

Exhibit 2: Austin's community emissions have decreased over time**



*CO2e signifies carbon dioxide equivalent, which is used to compare emissions from various greenhouse gases based on their global warming potential.

**Community-wide emissions data for 2018 was not finalized at the time of this report.

SOURCE: Office of Sustainability, October 2019

What We Found

Summary

The City of Austin has made considerable efforts to reduce the community's carbon emissions. Austin Energy, a City-owned electric utility, is on track to meet or even exceed its goal of generating 65% renewable energy by 2027. Austin Energy is making progress to stop energy generation from its power plants that emit large amounts of carbon. The City is also working to help the community reduce transportation emissions. However, it is unclear if the City will reduce transportation emissions enough to meet its goal for a carbon-neutral community by 2050. The City can do more to promote electric vehicles to advance the community's progress toward carbon neutrality.

Finding 1

Austin Energy is reducing carbon emissions from energy generation on track with the goal to be a carbon-neutral community in 2050.

Austin Energy generates energy from several different sources - coal, natural gas, nuclear, and renewable. Coal and natural gas produce large amounts of carbon emissions. Nuclear energy does not produce carbon emissions, but it is not renewable. Renewable sources, primarily wind and solar, do not produce carbon emissions.² The amount of energy generated from each source at a certain time varies due to the need for energy, weather conditions, and other factors.

Austin Energy must increase renewable energy generation and reduce generation from its sources that emit large amounts of carbon to stay on track for the 2050 carbon neutrality goal.

Austin Energy is increasing its percentage of renewable energy generation and is on track to meet or even exceed its 2027 renewable energy goal.

The Austin Energy Resource, Generation, and Climate Protection Plan to 2027 (AE 2027 plan) directs the City's efforts to increase renewable energy and close power plants that emit large amounts of carbon.

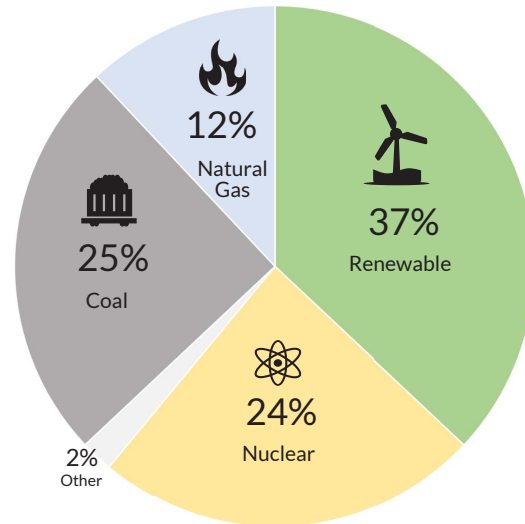
The AE 2027 plan sets a goal for Austin Energy to have 65% renewable energy generation by 2027. On average, Austin Energy's energy generation was 37% renewable from October 2018 to July 2019.³

Austin Energy's energy generation was 61% carbon-free overall (37% renewable and 24% nuclear) from October 2018 to July 2019.

² Austin Energy's renewable energy also includes a small amount of biomass.

³ Austin Energy's 37% renewable generation is a percentage of its total energy generation. During this same period, Austin Energy's renewable generation as a percentage of its customers' energy needs was 40%.

Exhibit 3: Austin Energy's generation was 37% renewable and 61% carbon-free* from October 2018 to July 2019



*Renewable generation is added to nuclear generation to calculate the carbon-free percentage.
SOURCE: Office of the City Auditor analysis of Austin Energy data, October 2019

Austin Energy projects energy generation will be 84% carbon-free overall (61% renewable and 23% nuclear) by 2021.

Austin Energy enters into agreements to buy renewable power from companies that own wind or solar farms. In August 2019, City Council approved the request to increase the amount of wind power Austin Energy buys. Austin Energy projects that the addition of this wind power will raise its renewable percentage to 61% by 2021.⁴

Based on these projections, Austin Energy will be close to reaching its renewable energy goal six years ahead of the target date.

Austin Energy is making progress to stop generation from two power plants that produce large amounts of carbon emissions.

The AE 2027 plan set goals for Austin Energy to stop production from two of its energy sources that emit large amounts of carbon. These energy sources are the Decker Creek Power Station and the Fayette Power Project.

The Decker Creek Power Station is a natural gas power station with two steam units, owned by Austin Energy. The AE 2027 plan sets targets to close one steam unit by the end of 2020 and to close the other steam unit by the end of 2021. Austin Energy has a defined plan and timeline to make progress toward meeting these goals. City staff who currently operate the Decker Creek Power Station will no longer have positions when both units are retired. Austin Energy is providing training to these employees to help them prepare for new employment.

The Fayette Power Project is a coal plant with three units. Austin Energy co-owns two of the units with the Lower Colorado River Authority (LCRA), a public utility created by the Texas State Legislature. LCRA owns the third unit. In August 2019, City Council approved Austin Energy's request for legal counsel to assist negotiations with LCRA to stop production from Austin Energy's share of the Fayette Power Project.

⁴ Austin Energy's 2021 projection that renewable generation will be 61% is reported as a percentage of its projected customers' energy needs.

Austin Energy staff say they are working to stop production from their share of the plant as opposed to selling their share to another entity.

Austin Energy has included the impact of stopping production from both of these energy sources in their budgetary and energy generation forecasts.

The City of Austin has a high percentage of renewable generation compared to peer cities, particularly peer cities in Texas.

Austin Energy is an electric utility owned by the City of Austin. As a result, the City of Austin has more control over its energy generation resources than cities who do not own their electric utility. Houston and Dallas do not own their electric utility. These cities do not have information about how much renewable energy supplies their communities. Austin Energy’s renewable generation is also 15 percentage points higher than the City of San Antonio, which does own its electric utility.

Exhibit 4: Austin’s percentage of renewable energy compared to peer cities that own their electric utility

| City | Community-wide energy goal | Renewable energy* |
|-------------|-----------------------------------|-------------------------------------|
| Seattle | Maintain a carbon-neutral utility | 93% in 2017 |
| San Jose | 100% renewable by 2050 | 45% |
| Austin | 65% renewable by 2027 | 37% |
| Los Angeles | 100% renewable by 2045 | 30% in 2017 |
| San Antonio | 40% renewable by 2040 | 22% |
| Columbus** | 10% renewable by 2020 | City does not have this information |

*Figures as of 2019 unless otherwise stated.

**Columbus’ municipally-owned utility is small and only serves about 14,000 customers.

SOURCE: Office of the City Auditor peer city analysis, October 2019

Finding 2

The City has efforts in place to reduce transportation emissions. However, it is unclear if the City will reduce transportation emissions to the extent needed to meet the 2050 carbon-neutral goal.

The Office of Sustainability projects that transportation will contribute to more than half of the community's carbon emissions by 2030.

The International Council on Clean Transportation highlights Austin as a regional leader in community adoption of electric vehicles. Almost a quarter of electric vehicles registered in Texas in 2018 were registered in Travis and Williamson counties.

People need to significantly decrease driving alone in gas-powered cars for the City to meet its goal to be carbon neutral by 2050.

Austin is a city that relies primarily on gas-powered cars to move around. About 75% of Austin residents commute to work by driving alone.

A primary way to decrease transportation emissions is for people to drive alone in gas-powered cars less often. This also has the potential to support other critical City goals, such as reducing congestion and car accidents.

The Austin Strategic Mobility Plan set a goal in 2019 to reduce the number of people driving alone to 50% by 2039. This effort will require changes to Austin's transportation infrastructure. The Austin Transportation Department (ATD) has strategies to invest in additional infrastructure such as sidewalks, bike lanes, and transit. These infrastructure changes are part of the strategies in the Austin Strategic Mobility Plan to work toward the goal of people driving less. Infrastructure changes are often long-term projects. These changes require significant time, money, and coordination with other entities.

The Austin Transportation Department also has programs to encourage people to change their habits. ATD runs an incentive program to encourage City employees to commute in ways other than driving alone. In addition, ATD works with an organization called Movability. Movability is a transportation management association that helps employers in Austin develop commute plans for their employees to drive alone less. ATD also has a public outreach program, Smart Trips, to help people learn about transportation options other than driving alone.

Despite these efforts, the City of Austin does not have direct control over whether someone decides to drive alone in a gas-powered car. This lack of control makes it difficult for the City to know if it will reduce transportation emissions enough to achieve the 2050 carbon-neutral goal.

In addition to driving less, people need to adopt electric vehicles in greater numbers for the City to meet its goal to be carbon neutral by 2050. The City can do more to promote electric vehicle adoption.

Electric vehicles are another way to reduce transportation emissions. It is important to note that electric vehicles do not reduce congestion or car accidents. Electric vehicles cannot replace efforts to encourage people to drive less. However, electric vehicles can contribute to carbon reduction without extensive infrastructure changes or modifications to people's transportation habits.

The City of Austin is working to add more electric vehicles where possible to its municipal fleet. In 2016, City Council passed a goal for the City to have 330 electric vehicles in its fleet by 2020. The City is on track to meet that goal as well as install the charging stations to support those vehicles. However, the municipal fleet is less than one percent of the total community carbon emissions.

The community needs to adopt electric vehicles in greater numbers to make significant progress toward the 2050 carbon neutrality goal.

The City also has efforts in place to encourage electric vehicle adoption in the community. Austin Energy is currently responsible for most of these efforts. Austin Energy has public charging stations throughout the city. Austin Energy offers rebates to single-family and multi-family residential properties for electric vehicle charging stations. Austin Energy created an online electric vehicle buying guide, which includes information such as charging station locations and available incentives for buying electric vehicles. Austin Energy also promotes electric vehicle adoption through social media and community events.

The International Council on Clean Transportation found that consumer incentives are important to increasing community electric vehicle adoption.

However, other cities have additional initiatives to encourage community electric vehicle adoption that the City of Austin does not. The City of Austin may be able to implement similar efforts to increase community electric vehicle adoption. The City of Columbus offers rebates for certain companies' employees to purchase electric vehicles. The cities of San Jose, Atlanta, and Boston have electric vehicle-ready ordinances. These ordinances require new parking construction to have a certain percentage of charging stations or at least electric connectivity for future charging stations.

The City of Austin does not have a comprehensive plan to increase community electric vehicle adoption. However, the City has already identified a need for this plan. In May 2019, City Council passed a resolution directing the City Manager to include an analysis of transportation electrification and action planning in the next update to the Austin Community Climate Plan. The Office of Sustainability is working on incorporating strategies to promote electric vehicles through the larger effort to update the Austin Community Climate Plan in 2020.

Appendix

Community-wide carbon reduction and energy goals of reviewed peer cities

Renewable and carbon-free energy percentages as of 2019 unless otherwise stated

| City | Community-wide carbon-neutral goal | Community-wide energy goal | Municipal owned utility? | Renewable | Carbon-free* |
|---------------|---|--|--------------------------|-------------------------------------|-------------------------------------|
| Seattle | 100% carbon-neutral community by 2050 | Maintain status as a carbon-neutral utility | Yes | 93% in 2017 | 97% in 2017 |
| San Jose | Reduce emissions 80% below 1990 levels by 2050 | 100% carbon-free by 2021 100% renewable by 2050 | Yes | 45% | 80% |
| Austin | 100% carbon-neutral community by 2050 | 65% renewable by 2027 | Yes | 37% | 60% |
| Los Angeles | 100% carbon-neutral community by 2050 | 100% renewable by 2045 | Yes | 30% in 2017 | 40% in 2017 |
| Denver | Reduce emissions 80% below 2005 levels by 2050 | 100% renewable by 2030 | No | 28% | 28% |
| San Antonio | 100% carbon-neutral community by 2050 | 40% renewable by 2040 | Yes | 22% | 36% |
| Boston | 100% carbon-neutral community by 2050 | 80% carbon-free by 2050 (State law) | No | 19% | 19% (nuclear is phasing out) |
| Atlanta | Reduce emissions by 20 percent below 2009 levels by 2020 and 40 percent by 2030 | 100% carbon-free by 2035 | No | 6% in 2018 | 26% in 2018 |
| New York City | Reduce emissions 80% below 2005 levels by 2050 | None | No | 5% in 2017 | 23% in 2017 |
| Columbus | Reduce emissions 20% below 2015 levels by 2020 | 10% renewable by 2020 | Yes** | City does not have this information | City does not have this information |
| Houston | None | None | No | City does not have this information | City does not have this information |
| Dallas | None | None | No | City does not have this information | City does not have this information |

*Nuclear energy is carbon-free but not renewable. This column adds the city's nuclear energy to its renewable energy.

**Columbus' municipally owned utility is small and only serves about 14,000 customers.

SOURCE: Office of the City Auditor peer city analysis, October 2019

Recommendations and Management Response

1

To further the City's progress to be a carbon-neutral community, the Office of Sustainability should ensure that innovative strategies to promote electric vehicles are considered as part of the process to update the Austin Community Climate Plan. The Office of Sustainability should ensure that responsibility for implementing these strategies is assigned to the appropriate entity. Potential strategies include:

- offering rebates for electric vehicles;
- establishing an electric vehicle-ready ordinance; and
- encouraging large employers to electrify their fleets.

Management Response: Agree

Proposed Implementation Plan:

Update to Community Climate Plan

The Office of Sustainability is managing the Community Climate Plan revision process and will provide regular reports to the Climate and Environment Leadership Team starting in 2020. This will ensure that City leadership has a complete picture of overarching climate change goals and City-wide mobilization efforts. We will be supported by staff from partnering departments and by community members who volunteer to participate in the process.

The overarching direction for the plan revision is being led by a Steering Committee composed of 20 Austin residents who will volunteer to participate in monthly meetings over the course of six months. Each emissions sector has a dedicated Advisory Group tasked with generating strategies and reduction targets for emissions from that sector. Each Group will have 3-5 City staff and 10-15 community stakeholders. Intentional inclusion of diverse perspectives has been a focus for all groups.

The Steering Committee will establish a charter and planning assignment for each Advisory Group to complete. The Steering Committee will also oversee the entire revision process, ensuring that the combined work of the process will achieve the necessary climate and equity outcomes over the next 5-10 years.

An Advisory Group has recently been formed which will have a specific focus on Electrification of the Transportation System, partly as a response to Council Resolution 20190509-020 which directed staff to "include an analysis of transportation and electrification and action planning in the next update to the City of Austin Community Climate Plan." Austin Energy is leading this Advisory Group. Organizations represented include ATD, City of Austin Fleet Services, CapMetro, Pecan Street, TXETRA, CAPCOG, Travis County, AISD, and the Energy Foundation.

Specific Focus on Electrification of the Transportation System

Building on the goals of the Austin Strategic Mobility Plan for a 50 percent mode-split, the updated Community Climate Plan will focus on the transition to zero-emissions technology with the creation of a comprehensive Electric Vehicle plan. In addition to electric vehicle ownership, staff will analyze options for shared mobility, fleets and public transit, logistics, and micro-mobility. This effort will include an analysis of scenarios for different EV adoption trends to determine interim greenhouse gas emissions targets. The transportation electrification plan will consider options for:

- establishing an electric-ready ordinance
- engaging the community to provide information on benefits and programs
- encouraging large employers to provide workplace employee charging and to electrify their fleets

- offering rebates for electric vehicles
- privately managed EV charging stations, parking, host issues, and access
- increasing access to EV charging for residents of multi-family housing, including on-site and off-site charging options (such as Level 2 workplace and DC-Fast charging)
- dealer engagement and customer experience
- shared, Electric, Autonomous Mobility as a service
- micro e-mobility
- fines for non-EV vehicles parking in public EV-only parking spaces

As part of the Community Climate Plan revision process, the respective roles for the City of Austin and other community stakeholders (e.g. Capital Metro, CAPCOG, CAMPO, school districts, and others) will be identified. In addition, potential barriers where the City does not exert direct control, as well as opportunities for partnerships with other governments and agencies will be identified. Stakeholders will include City departments such as Austin Energy, Planning and Zoning, Development Services, and the Austin Transportation Department, as well as external groups such as the Public Utilities Commission, TXETRA, and others.

Existing Considerations

To understand the efforts and context of this recommendation a few key considerations should be incorporated into planning that leverage existing programs and strategic plans.

- Currently Austin Energy manages over 850 publicly accessible charging stations powered by Texas wind energy.
- Approximately 85% of all EV charging occurs at home driven by customer preference and convenience.
- AE's renewable energy mix by default continues to get more "green" and the current Resource Plan includes 65% renewable energy by 2027 (and over 85% carbon-free due to nuclear generation).
- Partnerships with dealers is key as they drive the critical customer experience at the point of sale. There is currently a dealership engagement program underway led by Austin Energy in partnership with Bloomberg Philanthropies American Cities Climate Challenge and local auto dealerships.
- Austin Energy currently has a residential pilot to encourage "off peak" charging, EV 360.
- Austin Energy has a residential rebate program for home charging stations with an increase rebate amount for Wi-Fi enabled systems to lay the groundwork for managed charging pilots and programs.

Limitations and Concerns

- Electric vehicles and forms of transportation represent a rapidly evolving marketplace. Not all vehicle classes currently have alternative electric vehicles available as a replacement. Therefore, widespread adoption of electric vehicles is dependent on manufacturing, regional market availability, and emerging technology.
- Electric vehicles, when paired with renewable energy sources, represent significant opportunities to lower the carbon footprint associated with transportation. However, this approach alone does not lower congestion of vehicles that are stuck in traffic.
- Many of the approaches under consideration are dependent on consumer choices and behavior. The City of Austin can provide programs and awareness, but ultimately key decisions of adoption will be up to the preference of private individuals and organizations.

Proposed Implementation Date: An interim update to Mayor and Council will be provided by February 1, 2020 including lessons learned from EV grid integration efforts, demand response programs, and EV rate structures.

A completed Austin Community Climate Plan including specific updates on Electrification of the Transportation System will be provided by October 1, 2020.

Scope

The audit scope included City efforts to reduce carbon emissions from 2016 onward.

Methodology

To complete this audit, we performed the following steps:

- interviewed key personnel in the Office of Sustainability, Austin Energy, Austin Transportation Department, and Watershed Protection Department;
- reviewed City plans relevant to the City's carbon reduction efforts;
- validated data provided by Austin Energy and Office of Sustainability staff;
- observed a meeting of the Electric Utility Commission's working group created to update Austin Energy's resource plan;
- reviewed customer surveys for Austin Energy's home electric vehicle charger rebate program;
- reviewed documents related to Fleet Mobility Services' electric vehicle purchases and interviewed relevant staff;
- reviewed information on City outreach efforts to encourage fewer drive-alone trips;
- researched peer cities for information on efforts related to renewable energy and electric vehicles;
- evaluated internal controls related to the City's carbon reduction efforts; and
- evaluated the risk of fraud, waste, and abuse with regard to carbon reduction efforts.

Audit Standards

We conducted this performance audit in accordance with Generally Accepted Government Auditing Standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

The Office of the City Auditor was created by the Austin City Charter as an independent office reporting to City Council to help establish accountability and improve City services. We conduct performance audits to review aspects of a City service or program and provide recommendations for improvement.

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