Electricity and Natural Gas Sector – Phase 1 Strategies and Actions

STRATEGY 1: DECREASE ENERGY USE IN NEW AND EXISTING BUILDINGS					
Action	**Current Program**	**Cost**	**Carbon Impact**	**Status**	**Impact to Reaching 2020 Target**
Buildings and Integrated Efficiency (BIE)-1: Explore financing mechanisms to enable energy efficiency, demand response, distributed generation and energy storage. Possible financing mechanisms which could enable large amounts of private sector retrofits include Property Assessed Clean Energy (PACE) and Warehouse for Energy Efficiency Loans (WHEEL), and privately financed on-bill repayment.	Austin Energy continuously tracks and evaluates ways to provide demand-side management benefits to customers. Austin Energy was part of the initial team on PACE and actively supports, advertises, and educates prospective customers. WHEEL was not approved in the Texas Legislature. On-Bill repayment has many challenges and costs. As of January 2017 Austin Energy has two PACE projects for commercial properties. Austin Energy leverages a loan loss reserve fund to provide loans for bundled energy efficiency projects in single family homes. In FY16 the credit score required was reduced from 740 to 600 to increase participation. Over the winter of FY17, the interest rates were bought down to 1.99%. The rate will be increased to 3.99% in the spring due to costs.	$100,000 per year for buy-down costs (defaults will be paid via a loan loss reserve account containing $5 million established through an ARRA grant)	Since PACE projects have just begun, energy savings have not yet been documented.	**ONGOING**	**LOW**
Buildings and Integrated Efficiency (BIE)-2: Increase funding for energy efficiency rebates within the constraints of rate affordability goals. Emphasize market offerings or higher amounts that may attract new customers.	Austin Energy continuously evaluates optimal ways to use rebates to the benefit of customers and to achieve existing peak demand and climate goals. Strategies aimed at conserving energy will continue to be employed within the current budget as part of Customer Energy Solutions. FY17 focus areas include: • Commercial customer Tier alerts • Energy audit tool • Strategic Partnership of Utilities and Retailers (SPUR) • Expanded demand response opportunities • Targeted product marketing • Rebates for residential properties to tighten building envelopes and install higher energy efficiency equipment Austin Energy received an additional $2 million in the FY17 budget for energy efficiency rebates and programs for single-family and multi-family homes and commercial structures.	$2 million (FY17)	Based on CY15 performance metrics for energy efficiency programs, the additional $2 million budget allocation is expected to result in an additional 6,100 metric tons of greenhouse gas emissions avoided per year.	**ONGOING**	**HIGH**
Buildings and Integrated Efficiency (BIE)-3: Identify high energy users in all sectors and target incentives and initiatives to those users to maximize impact.	Full implementation of programs using Advanced Meter Infrastructure to analyze and use data in real time is an on-going multi-year project. See this presentation for an overview of the Advanced Meter Infrastructure program. Major accomplishments since 2015 include migration to an updated master data collection system (known as a “head end” system), upgrades to residential and commercial meters, and the use of some remote meter functionality instead of relying on service calls by truck. Interval data is now also being used to improve outage identification and response, avoiding the need for some truck activity.	New programs that use meter data will be evaluated as part of the Advanced Meter Infrastructure initiative, including cost and Return On Investment calculations.	Aggregate benefits to be realized with Advanced Meter Infrastructure program evolution are estimated at 200,000 metric tons of greenhouse gas emissions avoided per year.	**IN DEVELOPMENT**	**HIGH**

STRATEGY 1: DECREASE ENERGY USE IN NEW AND EXISTING BUILDINGS (CONTINUED)					
Action	**Current Program**	**Cost**	**Carbon Impact**	**Status**	**Impact to Reaching 2020 Target**
Buildings and Integrated Efficiency (BIE)-4: Promote specific high-impact strategies including envelope improvements (biggest impact), lighting retrofits (LEDs), HVAC improvements, water heating efficiency, and plug load reduction.	High-impact strategies are continuously researched and evaluated by Austin Energy staff. Strategies vary as technologies evolve. Austin Energy's Green Building program has two primary approaches for addressing building energy improvements. First, the energy code addresses the vast majority of buildings and has the highest impact / Return On Investment. Second, performance-based approaches can accommodate higher efficiency HVAC and water heating. Green Building ratings provide incremental benefits above code and are still a fantastic value overall and as a Return On Investment basis for new construction, as well as for existing buildings being retrofitted. Green Building is working on a new Integrated Modeling Incentive to provide greater energy savings for buildings as part of the design process. In FY2017 the Green Building program provided training to third-party integrated design modelers to promote use of the incentive. In 2016, a major update to the building code was also adopted (see **BIE-10**). Energy Efficiency Services offers rebates and education for all three sectors: commercial, residential and multifamily. These rebates focus on envelope improvements, lighting, HVAC, pumps, motors and industry specific measures.	Austin Energy Green Building will invest $3 million over 10 years toward the Integrated Modeling Incentive program and support. Energy Efficiency Services FY17 rebate budget is $17 million. An additional $2 million in rebates for AC tune-ups in low income single-family buildings and to address high bill complaints through field audits. (costs and carbon impacts accounted for in **BIE-2**)	The Integrated Modeling Incentive program is expected to avoid an additional 2,800 metric tons of greenhouse gas emissions over 10 years.	**IN DEVELOPMENT**	**HIGH**
Buildings and Integrated Efficiency (BIE)-5: Implement programs to reduce energy use and carbon intensity associated with water consumption.	Austin Energy Green Building ratings encourage reduced water consumption. Austin Energy will continue to coordinate with Austin Water Utility engineers on efficient end-use consumption. Austin Water Utility has on-going programs to promote more water efficient appliances.	This action is integrated into current budgeting for Austin Water Utility.	Sustained benefits of carbon avoided.	**ONGOING**	**MEDIUM**
Buildings and Integrated Efficiency (BIE)-6: Coordinate effort with Austin Water Utility to reduce energy use and carbon intensity associated with consumption, treatment, and delivery of water and wastewater.	Austin Water Utility purchases 100% renewable wind power for all its electricity needs and also tracks its combined water and wastewater energy intensity. For 2015, this energy intensity was 2.22 kilowatt hours per 1,000 gallons, and was 2% lower than 2014. It is also the lowest metric to date.	This action is integrated into current budgeting for Austin Water Utility.	Sustained benefits of carbon avoided.	**ONGOING**	**MEDIUM**
Buildings and Integrated Efficiency (BIE)-7: Expand the availability and use of automated demand response to more and new technologies.	The new Residential Energy Code adopted in September 2016 mandates internet-enabled thermostats for all new residential construction. Energy Efficiency Services provides rebates for residential, multifamily and commercial participation in demand response. Some demand response is enabled by collection and use of 15-minute interval meter data via Austin Energy's Advanced Meter Infrastructure (see **BIE-3** for status update).	The FY17 Energy Efficiency Services budget for demand response initiatives is $1.6 million.	Aggregate benefits to be realized with Advanced Meter Infrastructure program evolution are estimated at 200,000 metric tons of greenhouse gas emissions avoided per year.	**IN DEVELOPMENT**	**HIGH**

STRATEGY 1: DECREASE ENERGY USE IN NEW AND EXISTING BUILDINGS (CONTINUED)					
Action	**Current Program**	**Cost**	**Carbon Impact**	**Status**	**Impact to Reaching 2020 Target**
Buildings and Integrated Efficiency (BIE)-8: Increase meter reading frequency and use the information to identify opportunities for utility action, customer conservation, and demand response.	This action depends on full implementation of programs based on the functionality of advanced meters and support systems. (see **BIE-3** for status update)	New programs that use meter data will be evaluated as part of the Advanced Meter Infrastructure initiative, including cost and Return On Investment calculations.	Aggregate benefits to be realized with Advanced Meter Infrastructure program evolution are estimated at 200,000 metric tons of greenhouse gas emissions avoided per year.	**IN DEVELOPMENT**	**HIGH**
Buildings and Integrated Efficiency (BIE)-9: Create a new minimum standard for existing building energy use; enforce the new standard.	Establishing a new minimum standard would require wide-ranging stakeholder participation. Austin Energy currently does not have the programs, resources or authority in place to act in an enforcement capacity. Existing programs do report and benchmark energy use. The ECAD ordinance is used to benchmark energy use for existing buildings (commercial, multifamily and single family). Commercial buildings are required to report their energy use through either the Energy Star Portfolio Manager or the Key Code Reporting method.	Austin Energy will explore this further in FY17.	To be determined.	**NOT YET BEGUN**	**LOW**
Buildings and Integrated Efficiency (BIE)-10: Consider the potential for net-zero new construction of residential and commercial buildings.	Net-zero construction is not practical at present; however, the 2015 IECC was adopted with local amendments and became effective in September 2016. The adopted code includes a requirement to implement stricter energy efficiency measures and demand response compatible devices in all sectors. This is expected to increase deployment of smart thermostats.	Increased up-front costs for building owners to pay for new devices, which will be returned through energy savings (a net savings for the community).	Given the recent adoption of the new code, it will take years to see the impact on energy use and carbon savings.	**ONGOING**	**MEDIUM**
Buildings and Integrated Efficiency (BIE)-11: Educate designers, builders, code inspectors, and plan reviewers to gain higher compliance with new energy codes as they are implemented every three years.	Austin Energy provided training on new energy code requirements for code inspectors in August of 2016. The Green Building program continues their extensive outreach program. On February 2, 2017, Council approved a resolution to determine the number of dedicated plan reviewers and inspectors needed to fully enforce the energy code for residential and commercial buildings. Adding new inspectors is directly related to this action. Council will include this consideration during FY18 budget discussions.	Austin Energy-sponsored education is integrated into existing Customer Energy Solutions operations. Additional code inspectors will increase the City's budget.	In FY 16, the Green Building program resulted in energy savings of 30,500 megawatt hours. Over time, it may be possible to assess additional energy savings that are attributable to new energy code officers.	**ONGOING**	**HIGH**
Buildings and Integrated Efficiency (BIE)-12: Phase-in requirements to sub-meter new commercial office space as new permits are issued.	This could require future code-related changes. Development Services Department would be the lead department. This is also related to Advanced Meter Infrastructure deployment and is dependent on that multi-year schedule. (see **BIE-3** for status update)	Needs further exploration. This is expected to be more costly than other options available today.	To be determined.	**NOT YET BEGUN**	**LOW**

STRATEGY 2: LOWER GREENHOUSE GAS INTENSITY OF GENERATION RESOURCES SERVING THE COMMUNITY					
Action	**Current Program**	**Cost**	**Carbon Impact**	**Status**	**Impact to Reaching 2020 Target**
Resource Technologies (RT)-1: Begin a coordinated effort to prioritize strategic development and evolution of Smart Grid / Intelligent Energy Management Systems, within constraints of rate affordability goals, to further enable intermittent resources and use of electric vehicles for storage / demand shift.	In FY16, Austin Energy established the office of the Chief Technology Officer to help leverage technologies for grid and customer efficiency efforts. Austin Energy is investing in the capabilities needed to leverage meter data, and continues to work on battery-PV integration under the SHINES grant. Several pilot projects focused on distribution grid efficiency are currently underway; if successful and expanded system-wide, these have the potential to result in significant energy savings.	This action is carried within Austin Energy's existing budget. TCEQ and SHINES grants total $8.5 million, approximately $3.5 million is matched with funds from Austin Energy (already approved and included in budget).	Efforts are underway to calculate long-term benefits of distributed technologies including storage. Evaluations will take place in FY17.	**ONGOING**	**HIGH**
Resource Technologies (RT)-2: Prioritize investment in zero carbon-emitting resources at utility and / or customer scale: community and distributed solar, including concentrating solar; and wind (inland and coastal).	Austin Energy is on track to meet renewable energy, peak demand, and greenhouse gas reduction targets. A resource plan update will be released in April 2017. Since the Community Climate Plan was finalized, Austin Energy has signed contracts for 595.5 megawatts of utility-scale solar; in November 2016, 157.5 megawatts came online, and another 118 megawatts is planned to be online by the end of March 2017. The planned schedule for other major solar projects can be found in slide 8 of this presentation. 6,000 Austin Energy customers have installed solar totaling 46 megawatts in addition to the 30 megawatt Webberville Solar Project. Austin Energy is on track to meet the 110 megawatt local solar goal by 2020. Austin Energy's Community Solar program launched in January 2016, and the 2.5 megawatt Kingsbery Community Solar project is under development. Kingsbery is expected to be online this fall.	Costs of large scale renewable energy agreements are confidential. Austin Energy Solar Incentives in FY17 are $7.5 million.	A projected 5.54 million metric tons of greenhouse gas emissions will be avoided between 2016 and 2025 with new large scale renewable contracts.	**ONGOING**	**HIGH**
Resource Technologies (RT)-3: Routinely evaluate resource technologies for opportunities to incrementally reduce carbon intensity, including storage, distributed chilled water, biomass, geothermal, and nuclear, within constraints of rate affordability goals.	A dedicated Austin Energy resource planning team continuously evaluates all resource options as part of the biannual review of the resource plan. New resources such as the Electric Power Research Institute are being leveraged in support of these efforts.	This action is integrated within existing program costs.	No additional carbon savings to those achieved through existing programs.	**ONGOING**	**HIGH**
Resource Technologies (RT)-4: Evaluate technology and cost options for increasing natural gas system leak detection and reduction programs.	In March of 2016, ONE Gas, Inc. was one of the founding partners to launch the EPA's Natural Gas STAR Methane Challenge Program, providing a mechanism for oil and natural gas companies to make public commitments toward specific aggressive goals to reduce methane emissions beyond what is federally required. ONE Gas made a 5-year commitment to annually replace or rehabilitate at least 2% of its cast iron and noncathodically-protected steel pipe. This commitment applies to Texas Gas Service, and is intended to address the pipe types considered to have the highest emission rates. Although ONE Gas initiated efforts in 2016, 2017 will be the first full year of implementation with the first reporting anticipated in 2018.	The cost of implementing these activities is included Texas Gas Service's normal annual operations and maintenance expense.	It is difficult to quantify the precise levels of emissions reduction each year as the type of pipe replaced will vary from year to year. However, implementing this commitment will result in a cumulative reduction of methane emissions.	**IN DEVELOPMENT**	**MEDIUM**

STRATEGY 3: PROMOTE BEHAVIOR CHANGE TO REDUCE GREENHOUSE GASES					
Action	**Current Program**	**Cost**	**Carbon Impact**	**Status**	**Impact to Reaching 2020 Target**
Behavior Change (BC)-1: Increase efforts to engage customers to drive energy efficiency and demand response: increase transparency of energy costs in multifamily and commercial buildings; evaluate feasibility of neighborhood-wide energy efficiency challenges.	This action depends on full implementation Advanced Meter Infrastructure (see **BIE-3** for status update). Efforts are underway to allow customer service representatives to match customer billing, usage and other demographic information to better serve customers.	No additional cost (part of existing Operations & Maintenance budget).	Aggregate benefits to be realized with Advanced Meter Infrastructure program evolution are estimated at 200,000 metric tons of greenhouse gas emissions avoided per year.	**IN DEVELOPMENT**	**HIGH**
Behavior Change (BC)-2: Implement time of use / dynamic rates, including user educational efforts, supported by advanced metering and other technologies.	A time of use residential pilot program was approved as part of the August 2016 rate changes. Austin Energy has been assessing the viability of time of use rates for large commercial customers that have Advanced Meter Infrastructure and will propose a pilot time of use program in conjunction with the FY18 budget. Full availability of time of use data is dependent on full implementation and functionality of advanced meters and support systems, which will be completed over multiple years (see **BIE-3** for status update).	Time of use rates are typically structured to save customers money and be revenue neutral to the utility. The pilot project will provide data to evaluate the expected impact on consumers.	More work is needed to evaluate the impact of shifting energy usage to hours outside of peak times. Given the increasing amount of solar and renewables in the ERCOT market, this shift may have a minimal impact on carbon emissions.	**IN DEVELOPMENT**	**LOW**
Behavior Change (BC)-3: Expand educational efforts through social media, applications, competitions (individual and neighborhood scale) and exposure.	New efforts in 2016/2017 include Austin Energy-sponsored YouTube videos about specific energy programs and expanded use of Twitter	Customer Energy Solutions is evaluating the optimal use of its marketing budget to promote energy efficiency – no additional funding needed.	Too uncertain to parse out of overall Customer Energy Solutions program benefits.	**ONGOING**	**MEDIUM**
Behavior Change (BC)-4: Utilize meter reads and bill format / presentation to influence behavior. Present energy use in actionable and timelier ways to customers.	This action depends on full implementation Advanced Meter Infrastructure (see **BIE-3** for status update). Planning is underway to expand the customer online portal.	Other programs to use meter data for this purpose are currently being or will be evaluated as part of the Advanced Meter Infrastructure initiative, including cost and Return On Investment calculations.	Aggregate benefits to be realized with Advanced Meter Infrastructure program evolution are estimated at 200,000 metric tons of greenhouse gas emissions avoided per year.	**IN DEVELOPMENT**	**HIGH**

Transportation and Land Use Sector – Phase 1 Strategies and Actions

STRATEGY 1: INFRASTRUCTURE AND SERVICE					
Action	**Current Program**	**Cost**	**Carbon Impact**	**Status**	**Impact to Reaching 2020 Target**
Infrastructure and Service (IS)-1: Continue planning efforts to complete a connected network of proven high-capacity transit, including intracity and intercity systems, using the major projects identified in the Austin Strategic Mobility Plan and Project Connect to improve Austin's transportation and economic connections with other major cities in Texas.	**Capital Metropolitan Transportation Authority (CMTA) Strategic Plan (2014-2019)**: CMTA's strategic plan is reviewed and updated annually. The mission of CMTA is to "connect people, jobs and communities by providing high quality and sustainable transportation choices." **CMTA's Transit-Cycling Action Plan**: Through the Bike-Transit Advisory Team (internal), Capital Metro is developing a plan to assess current cycle-transit facilities and connections, as well as identify future improvements. **CMTA's MetroRail Long-Range Feasibility Study**: An internal technical feasibility study of the MetroRail system, both existing and future. The outcome of the feasibility study may result in more formal analyses of alternatives or environmental studies prior to any future rail investments. **CMTA's Connection 2025**: Connections 2025 is an in-depth review of the transit system with the purpose of meeting future demands and increasing public transit ridership. Connections 2025 will assess existing / projected future conditions and develop short- and long-range recommendations that result in an efficient, effective transit system with a clear direction for future development. Overall, the plan aims to utilize both innovative and proven solutions to create a more effective and integrated system to address the region's transportation challenges. **Project Connect**: Project Connect is the vision for Central Texas' high-capacity transit system, endorsed by the Transit Working Group, as a subcommittee of the Capital Area Metropolitan Planning Organization (CAMPO). Linking activity centers within the fastest growing region in the country, Project Connect aims to connect people, places and opportunities in an easy and efficient way. **Austin Strategic Mobility Plan (ASMP):** Austin Transportation Department is currently updating its transportation plan and the process is being coordinated with Capital Metro's current refinement of Project Connect. The draft ASMP is anticipated to be complete in December 2017, at which time the adoption process will include public hearings at related Boards, Commission, and City Council.	CMTA's funding comes from federal and state sources, local designated sales tax, and individual fares. Information about the budget can be found at: http://www.capmetro.org/transparency/ The Austin Strategic Mobility Plan will primarily be funded through City bonds, federal and state grants, public-private partnerships, and the development review process. The 2016 Mobility Bond included $6M for capital renewal projects as Local Mobility – Early Out Projects.	Capital Metro will measure greenhouse gas emissions and energy use related to operations and vehicles, ridership and passenger miles traveled (on transit), and land use / Transit Oriented Development. Methods used will be consistent with those used by other transit agencies and developed through the American Public Transportation Association (APTA) and Transit Cooperative Research Program (TCRP). Data is expected to be published in 2017.	**IN DEVELOPMENT**	**HIGH**

STRATEGY 1: INFRASTRUCTURE AND SERVICE (CONTINUED)					
Action	**Current Program**	**Cost**	**Carbon Impact**	**Status**	**Impact to Reaching 2020 Target**
Infrastructure and Service (IS)-2: Protect the safety of all right-of-way users and increase mobility by managing traffic speeds with regular synchronizing / retiming all traffic signals along arterials, adjusting speed limits within the urban core as appropriate, adding more volume-count stations to make informed traffic system improvements, installing more roundabouts, using enhanced bicycle signal detection technologies, and installing Pedestrian Hybrid Beacons.	Austin Transportation Department has multiple programs that manage and implement assets as part of this action item such as: signals (including bicycle specific signal improvements), Pedestrian Hybrid Beacons (PHB), and arterial geometric improvements. Voter approved bonds as well as maintenance and operational funds pay for these improvements. Austin Transportation Department currently houses data collection for these assets within the Traffic Engineering Division. Needs always outweigh available funding. For example: ~1/3 of signals should be re-timed yearly, while currently ~1/6 are achieved. In the fall of 2016, a roundabout was constructed at East St. Elmo Road and South Pleasant Valley Road / Todd Lane, which should result in safer right-of-way movements and lower emissions from reduced stops.	**2017 Signals Budget:** • FTEs: $4.1M • Consultants: $4.4M • Commodities: $0.5M • Refunds: ($1.5M) The 2016 Mobility Bond included $2M for safety and Vision Zero projects as Local Mobility – Early Out Projects.	Safety remains Austin Transportation's highest priority. Programs and designs that result in greenhouse gas emissions reductions are currently being identified and implemented. Peer referenced, technical literature has shown that well-timed signals, adaptive traffic signal control systems, and roundabouts can result, on average, in the reduction of emissions by 5%-10%, 10%, and 30%, respectively.	**ONGOING**	**LOW**
Infrastructure and Service (IS)-3: Request and promote extended transit service to suburban areas, while providing more service interconnections, exploring additional transit centers / park-and-rides, and transit vehicle amenities.	**CMTA Park & Ride Assessment Report:** An annual, internal technical assessment of existing and future park-and-ride facilities and needs throughout the Service Area. **CMTA, CAMPO & Central Texas Regional Mobility Authority Coordination:** Capital Metro participates in interagency coordination efforts on all regional transportation planning and projects that could benefit and / or impact public transit. **CMTA Transit Development Plans:** Capital Metro is working with several suburban cities (Georgetown, Buda, Hutto and Pflugerville) on Transit Development Plans, which are short-range plans that identify needs, analyze service options and financing, and provide recommendations for service. **Project Connect:** Project Connect is the vision for Central Texas' high-capacity transit system, endorsed by the Transit Working Group, as a subcommittee of the Capital Area Metropolitan Planning Organization (CAMPO). Linking activity centers within the fastest growing region in the country, Project Connect aims to connect people, places and opportunities in an easy and efficient way.	CMTA's funding comes from federal and state sources, local designated sales tax, and individual fares. Information about the budget can be found at: http://www.capmetro.org/transparency	Capital Metro will measure greenhouse gas emissions and energy use related to operations and vehicles, ridership and passenger miles traveled (on transit), and land use / Transit Oriented Development. Methods used will be consistent with those used by other transit agencies and developed through the American Public Transportation Association (APTA) and Transit Cooperative Research Program (TCRP). Data is expected to be published in 2017.	**IN DEVELOPMENT**	**HIGH**

STRATEGY 2: LAND USE					
Action	**Current Program**	**Cost**	**Carbon Impact**	**Status**	**Impact to Reaching 2020 Target**

Land Use (LU)-1: Prioritize mixed-use development integrated with transit and the creation of compact, walkable and bikeable places, with a commitment to plan transportation systems using an objective analysis of environmental considerations, demand models, congestion models, safety, and full life-cycle costs and benefits.	The Planning and Zoning Department is coordinating multiple planning initiatives that support the Imagine Austin Comprehensive Plan and implementation of this action:
	
	A public review draft of **CodeNEXT,** the update of Austin Land Development Code, was released in January 2017 and draft maps are anticipated to be released in April. Adoption of the code is currently slated for early 2018. Over the next year, stakeholders and the public will have extensive opportunities to review the draft and help shape the final product.
	
	Small Area Planning Program includes compact and connected planning efforts associated with the **Shoal Creek Neighborhood Plan** and **South Central Waterfront Plan Implementation** activities.
	
	Austin Transportation Department's update to the Austin Strategic Mobility Plan (see **IS-1**).
	
	CMTA Transit Oriented Development Program: Capital Metro's Transit Oriented Development Program completed a Priority Tool that was developed with input from a steering committee which included members of the City of Austin Housing+Transit+Jobs Working Group. Tools like these provide guidance on how to create more compact and connected mixed-use development in close proximity to transit.
		2017 Bicycle Master Plan Budget
		• FTEs: $430,000
		• Outreach / Marketing / Contract staff: $7,000
		TOTAL: $437,000
		
		[Per Bike Plan: Annual implementation cost (assuming the full 10-year build out) is estimated to be $15,170,000 per year, with ~$93M for tier 1 urban trails and ~$58M for on-street facilities.]
		
		Planning and Zoning Initiatives:
		• CodeNEXT: $3.15M
		  o Staff time: $650,000
		  o Consultant time: $2.5M
		• Shoal Creek Plan: $75,000
		• South Central Waterfront: $115,000
		• Downtown Wayfinding: $5,000
		• Great Streets Program: $60,000
		• Density Bonus Program: $15,000
		• Transit Oriented Dev.: $25,000
		TOTAL: ~$3.45M
		
		The 2016 Mobility Bond included $6M for capital renewal projects, and $2M for bikeways as Local Mobility – Early Out Projects.
			Bike Plan outcomes = 109,000 metric tons of greenhouse gas emissions avoided annually.
			
			Up to 767 tons of greenhouse gas emissions avoided daily from all Land Use actions.
			
			TOTAL = ~389,000 metric tons of greenhouse gas emissions avoided annually.
				ONGOING	**HIGH**

Land Use (LU)-2: Promote growth within designated activity centers as identified in Imagine Austin, where dense, mixed-use development supports centers and transit corridors, and incentives for infill development with long-term affordability for residents and businesses; develop an outreach program for available incentives and enhanced property locator tools (e.g. location efficient mortgages, tax credits).	The Planning and Zoning Department is coordinating multiple planning initiatives that support the Imagine Austin Comprehensive Plan and implementation of this action, such as the **CodeNEXT** update of the Austin Land Development Code, and **Small Area Planning Program** initiatives that include **Shoal Creek Neighborhood Plan** and **South Central Waterfront Plan Implementation Activities.** **CMTA TOD Plan**: Capital Metro is creating a Transit Oriented Development plan that will integrate and monitor current and changing land use, as well as the potential for additional MetroRapid stops and MetroRail Stations. The plan will integrate land use decisions with transit operations, promote better Transit Oriented Development, and increase transit ridership and revenue by comprehensively examining existing and planned conditions. It will allow decision-makers to better respond to market forces, community needs, and desired outcomes.	Costs for all Planning and Zoning initiatives are summarized in **LU-1.**	Emissions reductions for all Planning and Zoning initiatives are summarized in **LU-1.**	**ONGOING**	**HIGH**

STRATEGY 2: LAND USE (CONTINUED)					
Action	**Current Program**	**Cost**	**Carbon Impact**	**Status**	**Impact to Reaching 2020 Target**
Land Use (LU)-3: Create pedestrian- and bicycle-friendly districts connecting urban centers and transit stops; optimizing safety for people of all ages and abilities through clearly marked, dedicated, and separated urban trails and bike lanes; and wayfinding systems that incorporate national best practices.	**Bicycle Master Plan goals include:** • Increase citywide workforce bicycle commuting to 5% by 2020 (currently at 1.4%). • Increase central city workforce bicycle commuting to 15% by 2020 (currently at 5.6%). • 170,000 fewer daily trips by car; 460,000 reduction in vehicle miles traveled. **Urban Trails Plan:** 62 miles of urban trails were maintained; 2 projects (Phase 1 of the Northern Walnut Creek Trail and a portion of the Violet Crown Trail) were completed; 4 projects are under construction; and 8 projects are in the design phase. **Planning and Zoning**: Downtown Wayfinding Project; Great Streets Program; Small Area Planning Program including the Shoal Creek Neighborhood Plan and South Central Waterfront Planning. **CMTA's Transit-Cycling Action Plan**: Through the Bike-Transit Advisory Team (internal), Capital Metro is developing a plan to assess current cycle-transit facilities and connections, as well as identify future improvements.	**2017 Bicycle Master Plan Budget** • FTEs: $430,000 • Outreach / Marketing / Contract staff: $7,000 **TOTAL: $437,000** [Per Bike Plan: Annual implementation cost (assuming the full 10-year build out) is estimated to be $15,170,000 per year, with ~$93M for tier 1 urban trails and ~$58M for on-street facilities.] Costs for all Planning and Zoning initiatives are summarized in **LU-1.** The 2016 Mobility Bond included $6M for capital renewal projects, $10M for sidewalks, $2M for bikeways, and $1M for urban trails as Local Mobility – Early Out Projects.	Full build-out of the Bicycle Master Plan would achieve 170,000 fewer daily trips by car. Assuming each trip is 7 miles = 309,400,000 Vehicle Miles Traveled avoided. Over 10 years = 1,090,330 metric tons of greenhouse gas emissions would be avoided. Emissions reductions for all Planning and Zoning initiatives are summarized in **LU-1.**	**ONGOING**	**HIGH**
Land Use (LU)-4: Ensure that affordable housing and residential neighborhoods are within a quarter mile of existing or funded new transit options.	The Planning and Zoning Department is coordinating multiple planning initiatives that support the Imagine Austin Comprehensive Plan and implementation of this action, such as on-going calibration and implementation of the Density Bonus Program; Transit Oriented Development Program initiatives; the **CodeNEXT** update of the Austin Land Development Code**; Small Area Planning Program** including the **Shoal Creek Neighborhood Plan** and **South Central Waterfront Planning.**	Costs for all Planning and Zoning initiatives are summarized in **LU-1.**	Emissions reductions for all Planning and Zoning initiatives are summarized in **LU-1.**	**ONGOING**	**HIGH**
Land Use (LU)-5: Within the CodeNEXT land development code rewrite and its related public process, consider lowering barriers of adoption for duplexes, triplexes, and quadplexes, as well as accessory dwelling units, as appropriate.	The Planning and Zoning Department is coordinating multiple planning initiatives that support the Imagine Austin Comprehensive Plan and implementation of this action including the **CodeNEXT** update of Austin Land Development Code. The draft of CodeNEXT released in January 2017 allows a greater diversity of development types and "missing middle housing" through various transect and non-transect base zones.	Costs for all Planning and Zoning initiatives are summarized in **LU-1.**	Emissions reductions for all Planning and Zoning initiatives are summarized in **LU-1**.	**ONGOING**	**MEDIUM**

STRATEGY 3: TRANSPORTATION DEMAND MANAGEMENT					
Action	**Current Program**	**Cost**	**Carbon Impact**	**Status**	**Impact to Reaching 2020 Target**
Transportation Demand Management (TDM)-1: Support efforts to work with large employers and academic institutions to implement and improve trip reduction programs that include a regular survey of how the workforce commutes, explanation of benefits to commuters, and includes promotion of transportation alternatives (e.g. carpool/vanpool, bus/rail, bike/walk, flex/compressed work schedules) to their employees; celebrate successful programs.	**20/20 Mobility Challenge:** This citywide effort was initiated by the Mayor's office and organized by Movability Austin and other partners. Participating organizations and companies include AECOM, American Bank of Commerce, Box, Capital Metro, Concordia University, Eanes Independent School District, Google, Hilton Austin, Holtzman Partners, Lone Star Circle of Care, Mcgarrah Jessee, Outbound Engine, St. Edward's University, and YMCA of Austin. In 2015 / 2016, 27 companies went through the program. In Spring 2017, participating organizations will submit an inventory of existing mobility programs and survey employees to find out about current commute behavior. After analyzing the survey results, Movability Austin and the Thrival Company will lead each company in developing a three- to five-year plan for reducing drive-alone behavior. **Downtown Transportation Management Association (Movability Austin):** This non-profit is funded by the City of Austin, Capital Metro, and others to provide focused Transportation Demand Management solutions to the downtown core. Movability Austin currently serves ~37 members. **CTMA, MetroRideShare**: The MetroRideShare program is sponsored by Capital Metro and operated by vRide, a national vanpool service provider that provides all services necessary to enjoy a comfortable, convenient and economical commute to work. **CTMA MetroWorks**: MetroWorks is an Employee Transportation Benefits program of Cap Metro, that helps businesses and government agencies implement Transportation Demand Management measures, including public transit and ridesharing opportunities.	**<u>2017 Movability Austin Budget:</u>** • Outreach / marketing / contract services: $350,000	Baseline data will be collected for all new mobility challenge participants, as well as annual progress updates. Depending on the program, employer Transportation Demand Management programs can reduce Vehicle Miles Traveled 5% - 25%. Based on a 15% Vehicle Miles Traveled reduction and Texas Transportation Institute data: • 3,675,000 daily vehicle-miles traveled would be saved • 260 work days = 955,500,000 Vehicle Miles Traveled • At 25mpg, 38,220,000 gallons of gasoline would be saved • 336,718 metric tons of greenhouse gas emissions would be avoided	**IN DEVELOPMENT**	**HIGH**
Transportation Demand Management (TDM)-2: Seek opportunities to prioritize public transit within the network, and seek financing to extend service hours and frequency to increase use.	**CMTA's Connection 2025**: Connections 2025 is an in-depth review of the transit system with the purpose of meeting future demands and increasing public transit ridership. Connections 2025 will assess existing / projected future conditions and develop short- and long-range recommendations that result in an efficient, effective transit system with a clear direction for future development. Overall, the plan aims to utilize both innovative and proven solutions to create a more effective and integrated system to address the region's transportation challenges. **CMTA Frequent Service Network:** Capital Metro has invested in five routes based on ridership, productivity and coverage to create more frequent, reliable bus service and reduce wait times at stops.	CMTA's funding comes from federal and state sources, local designated sales tax, and individual fares. Information about the budget can be found at: http://www.capmetro.org/transparency	Capital Metro will measure greenhouse gas emissions and energy use related to operations and vehicles, ridership and passenger miles traveled (on transit), and land use / Transit Oriented Development. Methods used will be consistent with those used by other transit agencies and developed through the American Public Transportation Association and Transit Cooperative Research Program. Data is expected to be published in 2017.	**ONGOING**	**HIGH**

STRATEGY 3: TRANSPORTATION DEMAND MANAGEMENT (CONTINUED)					
Action	**Current Program**	**Cost**	**Carbon Impact**	**Status**	**Impact to Reaching 2020 Target**
Transportation Demand Management (TDM)-3: Increase bicycle and pedestrian mode share by promoting cycling for workers living near their workplace and children commuting to school. Increase safety and program performance based engineering, enforcement, education, and evaluation. Encourage the development of web-based tools / mobile applications / other educational materials. Increase the scope and impact of bike promotional events (e.g. Bike to Work Day and VIVA Streets!).	**Viva Streets! Open Streets Event:** On hold until more resources are identified. Current focus is on building a program that encourages active transportation, of which open streets events will be part. **Educational & Encouragement Campaigns:** FY16 events included guided walks, bike rides, bike to transit instruction, and other active mode encouragement as part of the Smart Trips program. The Active Transportation Division continues to provide free bike share memberships to city employees through the City of Austin Bike Share Benefit Program and has expanded offerings to City employees to include bicycle commute instruction through The Yellow Bike Project. See also **TDM-1** & **TDM-8** for overlapping items.	**2017 Active Transportation Budget:** • Outreach / Marketing / Contract staff: $90,000 The 2016 Mobility Bond included $3M for Safe Routes to School Program projects, $2M for bikeways, and $10M for sidewalk projects as Local Mobility – Early Out Projects.	Same as those listed in Land Use Strategy actions.	**ONGOING**	**HIGH**
Transportation Demand Management (TDM)-4: Support programs that help commuters make first and last mile transit connections, including promotion of first / last mile modes such as free circulator buses, collective zoned vanpool service, flex route systems, and bikeshare.	**CMTA Trail Feasibility Study.** Capital Metro conducted a study of potential bike-pedestrian route connections along the MetroRail route. Capital Metro and City of Austin are working to prioritize and implement improvements, such as the Crestview to Highland Station Urban Trail. **CMTA Frequent Service Network.** Capital Metro has invested in five routes based on ridership, productivity and coverage; to create more frequent, reliable bus service and reduce wait times at stops. **CMTA Mobile App.** Capital Metro now offers a free mobile app to promote using public transit. The app includes a Trip Planner, schedule times, service alerts and a mobile ticket option. **Austin B-Cycle.** B-Cycle is the network of more than 50 bike share stations and bikes. 2016 ridership numbers: • 550,399 total rides • 1,550,992 total miles ridden • 61,782,640 total calories burned • 143,104 total car trips avoided • 1,468,970 pounds of carbon offset 18 new B-Cycle stations will be installed in 2017 using federal funding matched with private funds. **Market District Shuttle**: The Rocky Mountain Institute and Movability Austin worked with employers in the Market District west of downtown near 6th and Lamar to develop and launch an employer-funded first-/last-mile shuttle to connect employees to Capital Metro services in eastern downtown during peak traffic hours. The initiative also provides off-peak on-demand transportation services for employees via B-Cycle, Car2Go and TNC credits.	CMTA's funding comes from federal and state sources, local designated sales tax, and individual fares. Information about the budget can be found at: http://www.capmetro.org/transparency The City continues to provide essential staff support for B-Cycle station location / relocation, contract oversight, strategic planning and other support. The City also supports the Bike Share Benefit Program that provides free annual memberships to employees. Support is estimated at $50,000 per year in staff and other support. The 2016 Mobility Bond included $10M for sidewalk projects as Local Mobility – Early Out Projects.	Capital Metro is measuring greenhouse gas emissions and energy use related to operations and vehicles, ridership and passenger miles traveled (on transit), and land use / Transit Oriented Development. Methods used are consistent with those used by other transit agencies and developed through the American Public Transportation Association and Transit Cooperative Research Program. Data is expected to be published in 2017. 2016 B-Cycle Stats: • 143,104 car trips avoided • 1,468,970 pounds of carbon offset	**IN DEVELOPMENT**	**HIGH**

STRATEGY 3: TRANSPORTATION DEMAND MANAGEMENT (CONTINUED)					
Action	**Current Program**	**Cost**	**Carbon Impact**	**Status**	**Impact to Reaching 2020 Target**
Transportation Demand Management (TDM)-5: Work with major event promoters to establish innovative transportation plans to ensure that visitors to the City have full information about transportation options.	**Special Events Ordinance:** This item will be brought back to Council for consideration in 2017. Elements from the Traffic Congestion Action Plan (TCAP) will be incorporated into the ordinance. **General Planning Assistance**: Austin Events conducts meetings with each event organizer to develop transportation options for specific events. Stakeholders involved include: Capital Metro, Austin Transportation Department, Austin Police Department, B-cycle, pedi-cabs, Transportation Network Companies, and taxis. **Parkland Events Task Force** – The Parkland Events Final Report includes recommendations to develop parking and traffic solutions for parks that would reduce usage of green space parking and enhance traffic flow. The report was reviewed by the Open Space, Environment, and Sustainability Committee on December 14, 2016 and is expected to be brought to Council in early 2017.	**2017 Events Budget:** 1 FTE @ $93,000; small percentage of Austin Center for Events staff time allocated.	No data available.	**ONGOING**	**LOW**
Transportation Demand Management (TDM)-6: Perform education and outreach to fleet owners on how to conduct a business evaluation of fleet usage, including operation and right-sizing analysis. Identify which incentives are available to replace older, higher-emission vehicles.	In 2015 and 2016, the Capital Area Council of Governments (CAPCOG) provided Clean Air Coalition members with fleet outreach and technical assistance through a contracted provider. In Spring of 2017, Travis County and the Clean Cities Coalition of Central Texas (Lone Star Clean Fuels Alliance) plan to host an education and outreach event for fleet owners and the public on the topic of alternative-fuel vehicles. City of Austin staff assisted Capital Metro in developing a fleet electrification plan. Capital Metro is now analyzing the feasibility and process for purchasing battery electric buses and sedans.	2015 outreach and technical assistance: $14,480 2016 outreach and technical assistance: $5,000	No data available.	**IN DEVELOPMENT**	**LOW**
Transportation Demand Management (TDM)-7: Provide amenities and incentives for programs that support active transportation, such as showers, tree shading, community gardens, neighborhood bike ambassadors, mobile bike repair, and bike cages.	**Bike Parking:** Continued installation of bicycle parking on City-owned right-of-way by request. **Code Amendments:** A 2012 code amendment allows reduced parking requirements if bike showers are built; continuing work with CodeNEXT on additional amenities to include in code. See also **TDM-8** for overlapping items.	Mostly built into CodeNEXT efforts.	No data available.	**ONGOING**	**LOW**

STRATEGY 3: TRANSPORTATION DEMAND MANAGEMENT (CONTINUED)					
Action	**Current Program**	**Cost**	**Carbon Impact**	**Status**	**Impact to Reaching 2020 Target**
Transportation Demand Management (TDM)-8: Encourage residents to limit single occupancy vehicle trips by taking alternative modes of transportation (e.g. carpool / vanpool, bus / train, bike / walk) by providing adequate information about their travel choices.	**Smart Trips:** Smart Trips Austin is an active transportation options program that aims to reduce single occupant vehicle trips and increase trips taken by foot, bike, bus or shared car. The City of Austin and Capital Metropolitan Transportation Authority (Capital Metro) are working together to encourage Austinites to consider more sustainable options for getting around town. These options can help you improve your health, save money, avoid traffic congestion and keep Austin a clean and beautiful place to live. A Pilot project kicked off in Fall of 2015, and Phase II was initiated in Spring of 2016. Phase III is anticipate to start in Fall of 2017. Phase 1: North Austin - 315 houses of the total 27,512 houses ordered Smart Trips tool kits. Post-program survey participants reported a 2% relative decrease in car trips and an 11% relative increase in active trips after the completion of the program. Overall active transportation mode share increased by 3% among participants. Phase 2: Central Austin - 531 houses of the total 12,612 houses ordered Smart Trips tool kits. Post-program survey participants reported that drive-alone mode share decreased 3.3%, with a corresponding increase of 5.9% in transit mode share, 2.6% in walking mode share, and 1.2% in “other” mode share. Bicycling and carpool mode share decreased by 1.0% and 5.4%, respectively. These findings show that the program succeeded in decreasing drive-alone trips and increasing active transportation.	**2016 Smart Trips Budget:** • FTEs: $120,000 • Consultants: $40,000 • Outreach / Marketing / Contract staff: $140,000 **2017 Smart Trips Budget:** • FTEs: ATD 1/8th FTE; Capital Metro 1/8th FTE • Consultant: estimated @ $130,000 • Outreach / Marketing / Contract staff:$300,000	Other Smart Trips programs throughout the nation have seen anywhere from 3% to 18% reduction in drive-alone trips. Using a 10% reduction of daily trips and Texas Transportation Institute data: • 2,450,000 daily vehicle-miles of travel saved. • 260 work days = 637,000,000 Vehicle Miles Traveled. • At 25mpg, 25,480,000 gallons of gasoline saved and 224,479 metric tons of greenhouse gas emissions avoided.	**ONGOING**	**HIGH**

STRATEGY 4: POLICY AND PLANNING					
Action	**Current Program**	**Cost**	**Carbon Impact**	**Status**	**Impact to Reaching 2020 Target**
Policy and Planning (PP)-1: Establish intergovernmental agreements between municipalities that include commitments to increase density around Centers.	Ongoing coordination with Capital Area Metropolitan Planning Organization and regional partners through CAMPO 2040 Plan and upcoming CAMPO 2045 update.	N/A	Up to 1054 tons of greenhouse gas emissions avoided per day when combined with Land Use actions ~280 tons of greenhouse gas emissions avoided per day as a stand-alone action	**ONGOING**	**HIGH**

STRATEGY 5: VEHICLES AND FUEL EFFICIENCIES					
Action	**Current Program**	**Cost**	**Carbon Impact**	**Status**	**Impact to Reaching 2020 Target**
Vehicles and Fuel Efficiencies (VFE)-1: Support programs and efforts that expand electric / alternative fuel infrastructure and consider incentives for the purchase of electric / alternative fuel vehicles by individuals and fleet owners. Pursue code options to increase "charger ready" parking.	**Plug-In EVerywhere:** Austin Energy installed the first Electric Vehicle (EV) charging infrastructure in the region in 2008 and now has over 500 EV charging ports at retail, workplace, multifamily, and fleet locations throughout Austin. Since 2011, the public network of stations has consumed 1.5 gigawatt hours of clean renewable win energy, powered by Austin Energy's GreenChoice program. Austin Energy and Austin Bergstrom International Airport have partnered to install 20 fast-chargers for ground service equipment vehicles (used to power luggage tugs and belt loaders operated by various airlines), reducing annual gas and diesel consumption by an estimated 40,000 gallons. Austin Energy has developed a showcase for sustainable transportation in the heart of downtown Austin, called Electric Drive. It features a DC fast charger that meets both standards for EV charging, as well as level 2 charging. A solar-powered kiosk also includes level 1 charging for electric bikes, scooters, motorcycles, and mopeds. Austin Energy is also integrating electric vehicle charging into their demand response programs, and has recently conducted a pilot to successfully show that PEV charging can be centrally managed to further improve grid reliability. Regional initiatives led by Austin Energy to plan for and support the adoption of alternative fuel vehicles in the Central Texas region include the Texas River Cities initiative and Central Texas Fuel Independence Project.	Austin Energy Electric Vehicles program has 3 FTEs. FY16 costs for staff, contractor support, services, marketing, station maintenance / networking, and related expenses was $1,037,020. Electric Vehicle rebates for public and private charging stations and electric bikes for FY16 totaled $225,383.	In 2016, the electric fuel used at 500+ charging stations consumed 581,065 kilowatt hours, offsetting 75,759 gallons of gasoline and reducing greenhouse gas emissions by 673 metric tons. EVs in Austin resulted in a total reduction of 1,870,380 gallons of gasoline and 13,257 metric tons of greenhouse gas emissions. 3,694 vehicles @ 12,000 miles each = 44,328,000 miles traveled.	**ONGOING**	**MEDIUM**

STRATEGY 6: ECONOMICS AND PRICING SYSTEMS					
Action	**Current Program**	**Cost**	**Carbon Impact**	**Status**	**Impact to Reaching 2020 Target**
Economics and Pricing Systems (EPS)-1: Pursue a fair market value for parking through demand-based commodity pricing.	**Parking Benefit Districts:** One is located in West Campus. **Parking and Transportation Management Districts:** There are two, located in East Austin and Mueller. **Metered / Priced Parking:** Metered parking rates will be raised by $0.20 in 2016 for the downtown area only (I-35 to Lamar, and Lady Bird Lake to 10th Street). **Downtown Parking** on Wednesday nights is currently not being enforced. In 2017 City Council will consider a code change in order to apply a fee for Wednesday night parking.	2017: • Parking Enforcement Officers: $2,218,517 • Meter Shop: $2,048,254 (100% time)	Not quantified.	**IN DEVELOPMENT**	**MEDIUM**

STRATEGY 6: ECONOMICS AND PRICING SYSTEMS (CONTINUED)					
Action	**Current Program**	**Cost**	**Carbon Impact**	**Status**	**Impact to Reaching 2020 Target**
Economics and Pricing Systems (EPS)-2: Allow high occupancy and zero-emission vehicles access to toll roads at reduced or free rates.	**Tolling Pilot:** The Carma carpooling app provides toll reimbursements. Analysis of use found that "real-time ridesharing programs, facilitated by smartphone technology, have the potential to incentivize behavior." The original pilot has not been continued.	The initial pilot of the app was conducted at no cost to the City of Austin. Toll discounts were provided by CTRMA through a federal grant.	Based on 95 unique drivers: • 2,200 trips • 80% were 2 person but the others were 3+ • No data on average trip length, but targeted employers averaged ~50 miles round-trip to downtown • 110.000 miles at 25 mpg = 4,400 gallons of gas (39 metric tons of greenhouse gas emissions avoided)	**IN DEVELOPMENT**	**LOW**

Materials and Waste Management – Phase 1 Strategies and Actions

STRATEGY 1: METHANE (LANDFILL GAS) MANAGEMENT					
Action	**Current Program**	**Cost**	**Carbon Impact**	**Status**	**Impact to Reaching 2020 Target**
Methane Management (MM)-1: Austin Resource Recovery refines landfill gas capture and combustion system to destroy methane.	A 2016 feasibility study found that the closed City of Austin landfill on FM 812 does not generate a sufficient volume and quality of landfill gas for viable energy recovery. Landfill managers will continue to fine-tune the gas collection system to optimize its effectiveness.	Unknown.	2015 City landfill emissions = 34,329 metric tons of greenhouse gas emissions (35% less than 2013).	**ONGOING**	**MEDIUM**
Methane Management (MM)-2: Area landfill operators refine landfill gas capture and combustion system to destroy methane at their landfills.	The City of Austin engaged local landfill operators during the development of the Community Climate Plan and informally in 2015. Reported emissions from private landfills is 7% less than in 2013, even though disposal increased 12%. The City will continue to encourage landfill operators to increase the capture and destruction of landfill gas in Travis County. Number of wells (2013 / 2014 / 2015): • City of Austin: 67 / 63 / 63 • Republic: 222 / 222 / 222 • Texas Disposal Systems: 6 / 15 / 15 • Waste Management: 126 / 126 / 128 **TOTAL: 421 / 426 / 428** Gas Collection System Capacity (actual cubic feet per minute) (2013 / 2014 / 2015): • City of Austin: 1500 / 1500 / 1500 • Republic: 6000 / 6000 / 6000 • Texas Disposal Systems: 700 / 600 / 600 • Waste Management: 3000 / 5200 / 5200 **TOTAL: 11,200 / 13,300 / 13,300**	No cost to the City of Austin. Generating energy produces revenue or displaces an expense.	2015 private landfill emissions = 557,835 metric tons of greenhouse gas emissions (7% less than 2013 even though disposal increased 12%). Taking this action would reduce some but not all of these emissions.	**IN DEVELOPMENT**	**HIGH**

STRATEGY 2: RECYCLING					
Action	**Current Program**	**Cost**	**Carbon Impact**	**Status**	**Impact to Reaching 2020 Target**
Recycling (RE)-1: Expand materials accepted by curbside recycling service and increase the service to weekly collection.	Austin Resource Recovery contracts with Texas Disposal Systems and Balcones Recycling to process single-stream materials collected by Austin Resource Recovery's curbside recycling service. These 20-year contracts provide periodic opportunities to add materials to the single-stream mix, but no new materials are currently under discussion. Opportunities for weekly service will be analyzed after full implementation of curbside organics collection (**OD-2**). *[Actions **RE-1, RE-3, RE-5,** and **OD-2** have overlapping impacts; implementing all three wouldn't necessarily be the sum of the impacts for each action.]*	The Austin Resource Recovery FY17 budget forecast estimated this would cost on average about $3 per month per customer, totaling about $7 million annually. Many individual customers would offset increased costs by downsizing their carts.	The *2014 Residential Diversion Study* found about 40,000 tons per year of single-stream recyclables in trash carts. Diverting 100% would reduce direct emissions by 1,900 metric tons and indirect emissions by 89,000 metric tons annually.	**ONGOING**	**MEDIUM**
Recycling (RE)-2: Increase convenience, efficiency, and effectiveness of downtown alley trash and recycling collection service.	Austin Resource Recovery's 3-year contract with Texas Disposal Systems began in 2014 and provides for collection of trash and recyclables in many downtown alleys. Austin Resource Recovery converted separate paper and glass recycling services to single-stream recycling. Since then, diversion continues to increase steadily.	On a per volume basis, recycling services cost less than trash ($2.74 vs. $3.30 per cubic yard of service). The primary cost to increase diversion is marketing, which is a significant variable.	Using rough estimates of the Central Business District material stream, the collection of single-stream recyclables could increase from 1,700 to 2,500 tons per year, reducing direct emissions by 230 metric tons and indirect emissions by 2,270 metric tons annually.	**ONGOING**	**LOW**
Recycling (RE)-3: City maintains its Pay-As-You-Throw rate structure to provide a strong financial incentive for residential customers to reduce disposal.	Through the annual budgeting process, Austin Resource Recovery evaluates alternative Pay-As-You-Throw rate structures, including elimination of the 96-gallon cart in FY20. *[Actions **RE-1, RE-3, RE-5,** and **OD-2** would have overlapping impacts; implementing all three wouldn't necessarily be the sum of the impacts for each action.]*	Any impacts to costs and revenues will be included in the FY18 budget.	The *2014 Residential Diversion Study* found about 40,000 tons per year of single-stream recyclables in trash carts. Diverting 100% would reduce direct emissions by 1,900 metric tons and indirect emissions by 89,000 metric tons annually.	**ONGOING**	**MEDIUM**
Recycling (RE)-4: Ensure that businesses and multifamily properties affected by the Universal Recycling Ordinance maximize diversion of recyclable materials.	Austin Resource Recovery's *2015 Community Diversion Study* estimated the diversion rate to be 42%. Austin Resource Recovery provides education and training on how to comply with the Universal Recycling Ordinance, which resulted in 90% of the 3,300 affected properties completing annual diversion plans in FY16.	Costs to implement action **OD-1** are included with this action. <u>FY2017:</u> • 10 FTEs • $1 million for outreach, data management, & enforcement	If diversion as reported by Licensed Haulers increases from 425,000 tons per year (*2015 Community Diversion Study*) to 700,000 tons per year (FY20), this action would reduce direct emissions by 89,000 metric tons and indirect emissions by 777,000 metric tons annually.	**ONGOING**	**HIGH**

STRATEGY 2: RECYCLING (CONTINUED)					
Action	**Current Program**	**Cost**	**Carbon Impact**	**Status**	**Impact to Reaching 2020 Target**
Recycling (RE)-5: Research peer cities and explore phase-in of mandatory recycling and composting.	Austin Resource Recovery is continually researching best practices on these and other initiatives in communities that include San Francisco, San Diego, Pittsburgh, Portland, and Seattle. *[Actions **RE-1, RE-3, RE-5,** and **OD-2** would have overlapping impacts; implementing all three wouldn't necessarily be the sum of the impacts for each action.]*	Research costs covered by existing staff; other costs could include conference participation and travel.	The *2014 Residential Diversion Study* found about 40,000 tons per year of single-stream recyclables in trash carts. Diverting 100% would reduce direct emissions by 1,900 metric tons and indirect emissions by 89,000 metric tons annually.	**ONGOING**	**LOW**
STRATEGY 3: ORGANICS DIVISION					
Action	**Current Program**	**Cost**	**Carbon Impact**	**Status**	**Impact to Reaching 2020 Target**
Organics Diversion (OD)-1: Ensure that businesses affected by the Universal Recycling Ordinance maximize diversion of organics.	The *2015 Community Diversion Study* estimated 37% of discarded materials were compostable. Applying that percentage to the 950,000 tons reported by licensed haulers yields 176,000 tons of discarded compostable materials. In FY17, the Universal Recycling Ordinance began requiring 220 food service establishments to establish programs to divert organic materials. The number of affected establishments will increase through FY19, when all will be required to comply.	Costs to implement this action are included with **RE-4** because the two are interrelated; two of the FTEs listed in **RE-4** focus on this action.	<u>BY FY2020:</u> Assuming food service establishments affected by the URO generate 50% of the 176,000 tons of discarded compostable materials, diverting 50% will avoid 13,000 metric tons of direct emissions and 6,000 metric tons of indirect emissions annually.	**ONGOING**	**MEDIUM**
Organics Diversion (OD)-2: Expand collection of food residuals and other compostable, non-recyclable materials to all residential customers.	The adopted FY17 budget planned for a 4-year citywide phase-in, with service expanded to 50,000 households in FY17. For the FY18, FY19, and FY20 budgets, Austin Resource Recovery anticipates requesting funding to add 50,000 more households each year. *[Actions **RE-1, RE-3, RE-5,** and **OD-2** would have overlapping impacts; implementing all three wouldn't necessarily be the sum of the impacts for each action.]*	The Austin Resource Recovery FY17 budget forecast estimated this cost would average at least $4.10 per month per customer, phased in over 5 years. FY17 total cost is ~$2.4M.	Diverting 50% of 30,000 tons of residential food scraps reduces greenhouse gas emissions by 10,700 metric tons.	**ONGOING**	**MEDIUM**

STRATEGY 3: ORGANICS DIVISION					
Action	**Current Program**	**Cost**	**Carbon Impact**	**Status**	**Impact to Reaching 2020 Target**
Organics Diversion (OD)-3: Austin Water Utility's compost operation transitions from yard trimmings to other carbon sources and bulking agents, such as clean lumber and tree trimmings from other City departments and their contractors.	Currently, Austin Resource Recovery delivers yard trimmings to the Austin Water Utility's biosolids composting operation. Over the next few years, the number of residential customers that can add food residuals (**OD-2**) to their yard trimmings will be gradually increased. The Federal Aviation Administration does not allow food in the City's biosolids composting operation, so the quantity delivered by Austin Resource Recovery will gradually decrease. Work is underway to identify and accept other carbon sources, such as tree trimmings from Austin Energy and the Parks and Recreation Department. In addition, Austin Water Utility will invite proposals for contractors to compost biosolids.	No cost to Austin Resource Recovery; Austin Water Utility costs should be minimal; Austin Energy, the Parks and Recreation Department and contractors may incur some costs to shift materials to alternate destination (Hornsby Bend Wastewater Treatment Plant).	Currently Austin Resource Recovery delivers ~ 28,000 tons of yard trimmings annually; new material delivered to Hornsby Bend would reduce emissions by 1,900 metric tons.	**ONGOING**	**LOW**
Organics Diversion (OD)-4: Private haulers collect all organics and non-recyclable materials from their customers (including multifamily housing).	A new policy or regulation would be needed to foster this service. Compost Pedallers and others offer this service, but their recovered volumes are very small in aggregate (~100 tons / year).	Zero Waste Rebate: $1,800 each, for up to 50 businesses per year.	Unknown without specifying materials and quantities.	**IN DEVELOPMENT**	**MEDIUM**
Organics Diversion (OD)-5: Urban agricultural operations, from community gardens to regional farmers, produce and use compost from local sources.	The City of Austin has several programs that are increasing the production and use of compost from local sources including: • Austin Resource Recovery's Home Composting Rebate, which offers free community composting classes, and an online tutorial managed by full-time compost coordinator. • Curbside Organics Collection provides 50,000 households with a weekly collection service (organics are processed locally). • City-sponsored community gardens in fourteen locations across the city, almost all of which accept organic materials generated within the neighborhood to create compost for use on-site. Additionally, there are several organizations in Austin that are working to connect organic feedstock to community compost operations to minimize the amount of organic materials transported to landfills.	Staff and program budgets are included in Austin Resource Recovery, Office of Sustainability, and Parks and Recreation operations.	By producing and utilizing compost on-site, urban agricultural operations can contribute to greenhouse gas reductions by avoiding the emissions associated with transporting and turning compost.	**ONGOING**	**LOW**

STRATEGY 4: PURCHASING					
Action	**Current Program**	**Cost**	**Carbon Impact**	**Status**	**Impact to Reaching 2020 Target**
Purchasing (PU)-1: City develops construction specifications for citywide building permits and public works contracts and adopts specifications for roadway projects that include more locally produced recycled-content materials.	The Public Works Department will consider specifying recycled materials in some roadway and public works projects. Austin Resource Recovery and Public Works will develop an inventory of materials with possible public works applications.	Unknown until materials and applications are identified.	Unknown without specifying materials, applications, and quantities.	**IN DEVELOPMENT**	**MEDIUM**
Purchasing (PU)-2: City adopts procurement specifications for materials reuse, reduced packaging, products with low embodied energy, materials with recycled content, and locally manufactured products and the City encourages other agencies and enterprises to follow suit.	Printer and paper policy is in place. The Office of Sustainability is working with Central Purchasing to perform annual training on sustainable procurement specifications, as well as development of a spend analysis and strategic approach for FY17. The primary focus for this year is on large, multi-departmental contracts, centered on furniture, office supplies, janitorial supplies/services, and uniforms.	Limited time from FTEs in both Office of Sustainability and Central Purchasing.	Unknown without specifying materials, applications, and quantities.	**IN DEVELOPMENT**	**HIGH**
STRATEGY 5: REUSE / REDUCE					
Action	**Current Program**	**Cost**	**Carbon Impact**	**Status**	**Impact to Reaching 2020 Target**
Reuse / Reduce (RR)-1: Austin Resource Recovery adds new Reuse Centers, including centers for hard-to-recycle items.	On October 17, 2015, Austin Resource Recovery combined and expanded the Household Hazardous Waste and Resource Recovery Center into the Reuse and Recycling Drop-Off Center. The Center accepts household hazardous waste and hard-to-recycle items, such as Styrofoam, plastic film, and electronics. A similar facility will be located at the future northeast Austin service center on land the City purchased in 2013. Additional drop-off centers will depend on funding.	12.5 FTEs $1.8 million per year	Not able to quantify at this time.	**ONGOING**	**LOW**
Reuse / Reduce (RR)-2: City supports local enterprises that repair goods and products.	Austin Resource Recovery's Locally Austin initiative promotes more than a dozen local repair businesses.	Marketing costs are minimal.	No information reported from private businesses.	**ONGOING**	**LOW**
Reuse / Reduce (RR)-3: The City supports local economic development through the (re)Manufacturing Hub, Austin Materials Marketplace, and reuse enterprises for reuse of production byproducts or general reuse of goods.	Austin Resource Recovery and the Economic Development Department hired a consultant to analyze public-private partnership options for the (re)Manufacturing Hub. Austin Resource Recovery promotes Fixit clinics and dozens of reuse businesses, including non-profits like Goodwill, Habitat for Humanity's ReStore, and Austin Creative Reuse. In FY17, Austin Resource Recovery contracted for curbside textile recovery.	Materials Marketplace: FY17: $78,000 FY18: $70,000 (Re)Manufacturing Hub: FY17: $54,000	Depends on types and quantities of materials and goods.	**IN DEVELOPMENT**	**LOW**
Reuse / Reduce (RR)-4: The City implements policies to reduce the use of single-use products in addition to carryout bags.	The City of Austin to develop and implement expanded policies around polystyrene foam use.	Depends on products to be impacted.	Depends on products.	**IN DEVELOPMENT**	**LOW**