

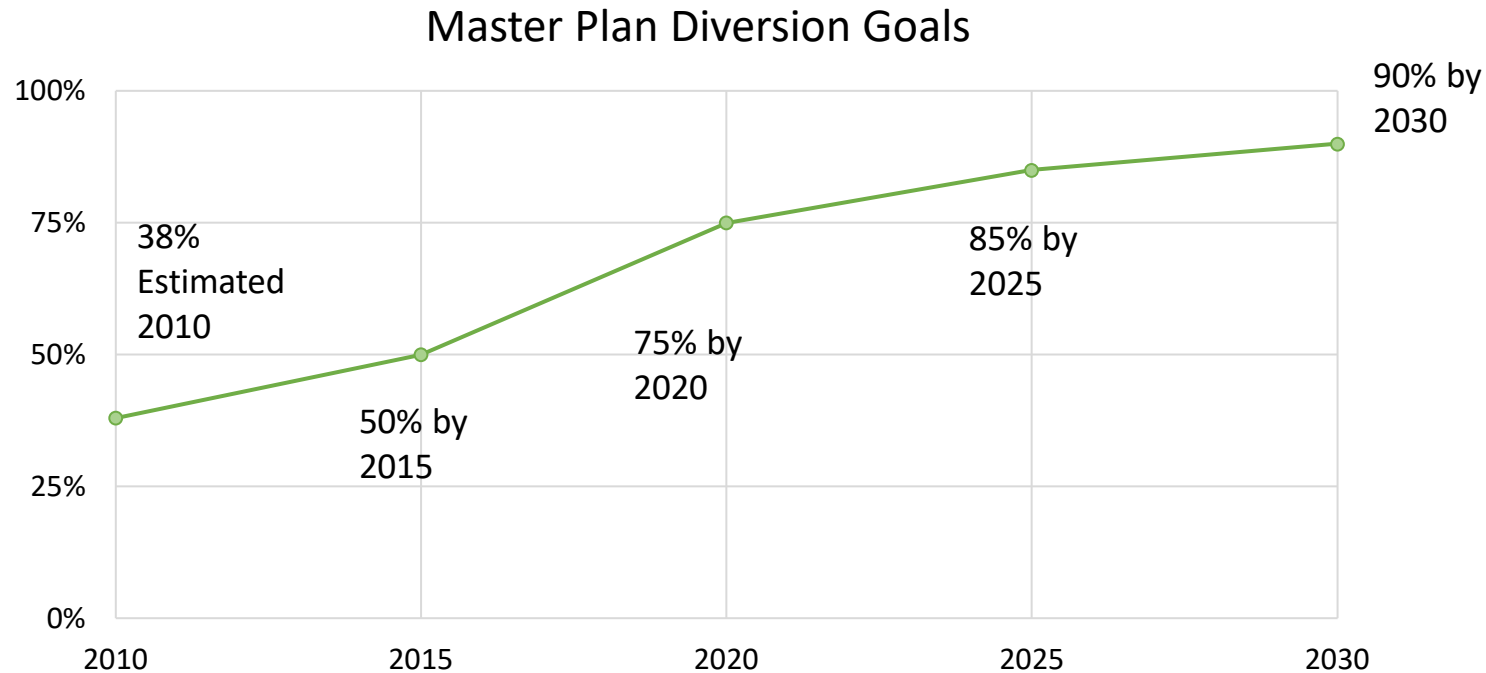
City of Austin

2020 Waste Characterization, Capture Rate and Diversion Study



INTRODUCTION

- 2011: Austin Resource Recovery (ARR) Master Plan adopted
- Master Plan set city-wide diversion goals

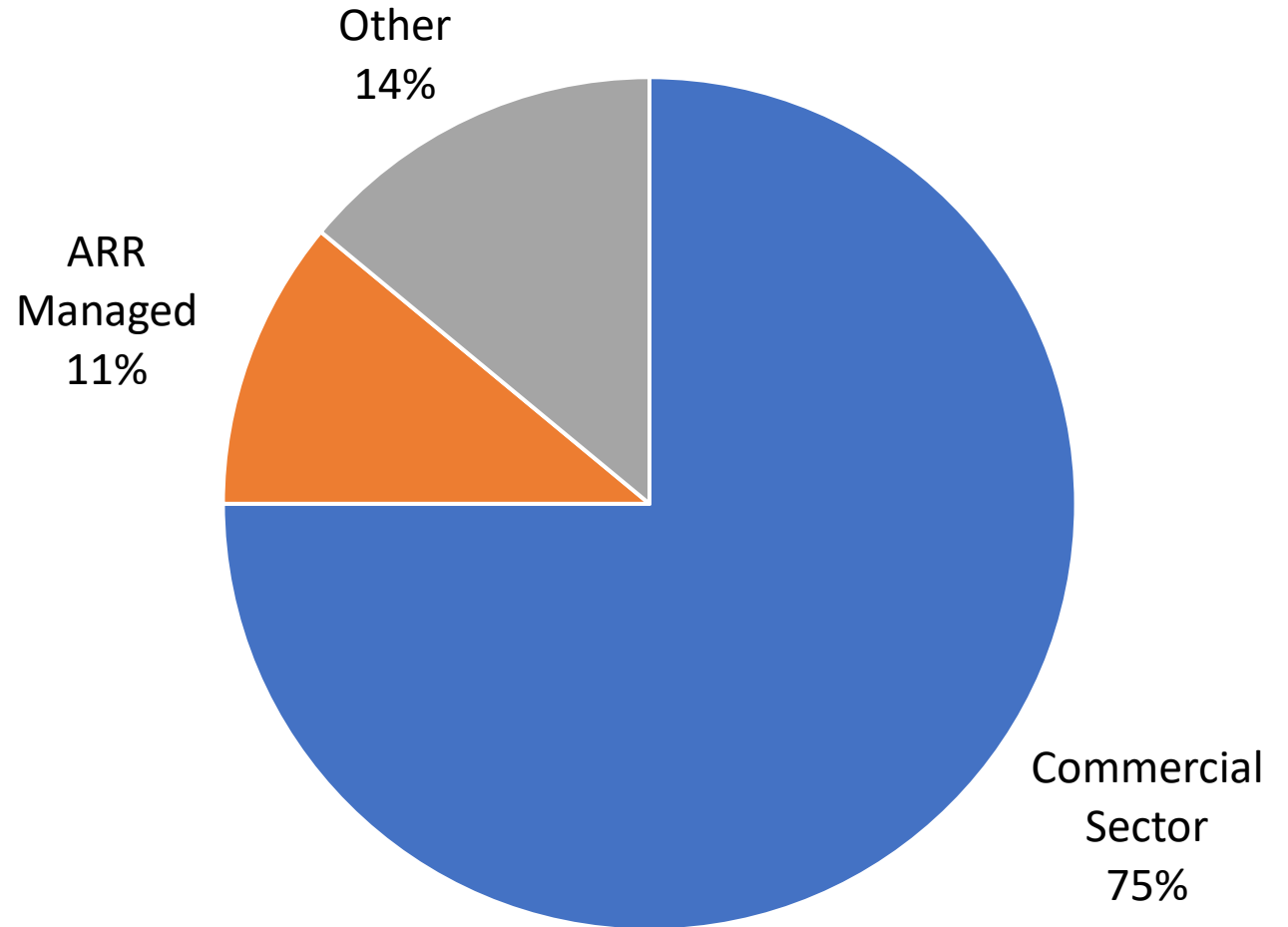


- Baseline Studies: 2014 ARR-Collected Waste Characterization Study
2015 Community Diversion Study
- This 2020 Study was commissioned to evaluate diversion and capture rates



AUSTIN'S WASTE GENERATION BY SECTOR

- Approximately 11% of waste generated in the city of Austin is residential waste collected by ARR
- Approximately 75% is commercial and multifamily waste collected by commercial haulers
- The remaining “orphan” generation is from alternative recycling, reuse, and reduction practices



WHAT IS DIVERSION RATE, WHAT IS CAPTURE RATE

Diversion Rate is a quantification of how much generated waste is diverted from being landfilled or incinerated

$$\text{Tons Diverted} = \text{Tons Recycled} + \text{Tons Composted} + \text{Tons Reused} + \text{Tons Reduced}$$

$$\text{Diversion Rate (\%)} = \frac{\text{Tons Diverted}}{\text{Tons Diverted} + \text{Tons Disposed}}$$

Capture Rate is the percentage of generated waste that is disposed of in the correct waste stream (e.g. if two of three water bottles are placed in the blue recycle cart, the capture rate of water bottles is 66.7%)

Disposal Rate (usually expressed as tons/capita/year or pounds/capita/week) is that rate at which materials is landfilled and incinerated. The per capita disposal rate is the measure of waste generated per person within a specified region or population.

DATA SOURCES – RESIDENTIAL (ARR) COLLECTION

Material collected in the following programs:

- Trash Carts
- Recycle Carts
 - Contamination amount
- Compost Carts
 - Contamination amount
- Bulky Collection
- Separate Brush Collection
- RRDOC Material



DATA SOURCES – LICENSED HAULER REPORTS

- The largest data source for waste generated by the commercial sector is Licensed Hauler Reports
- Waste Haulers within Austin are licensed and are required to submit semiannual reports on the quantity of waste they collected in the categories of landfill trash, recyclables, and organics (compost)
- Accounts for the largest amount of waste generated in the City
- Large haulers typically have good material tracking procedures in place
- ARR is the fourth largest hauler in the City of Austin

2020 Collection Quantities (Full-Service Haulers and ARR)			
	Trash (tons)	Recycling (tons)	Compost (tons)
Texas Disposal Systems	340,888	155,295	18,054
Waste Management of Texas	452,219	30,439	4,213
Waste Connections	293,718	32,443	177
Central Texas Refuse	75,385	13,516	--
All other Commercial Haulers	142,866	202,628	58,995
Austin Resource Recovery	159,560	54,397	51,085

DATA SOURCES – UNIVERSAL RECYCLING ORDINANCE

- Implementation of the URO began in 2012 and it is now fully rolled out
- Requires commercial businesses or properties and multi-family properties to submit annual diversion plans (ADP)
- Over 8,000 businesses provided information on their recycling, compost, and trash collection programs
- Requires food-permitted businesses to submit Organics Plans (OPs) to show accessibility and education regarding diversion of organics
- Over 5,000 businesses provided information through Organics Plans

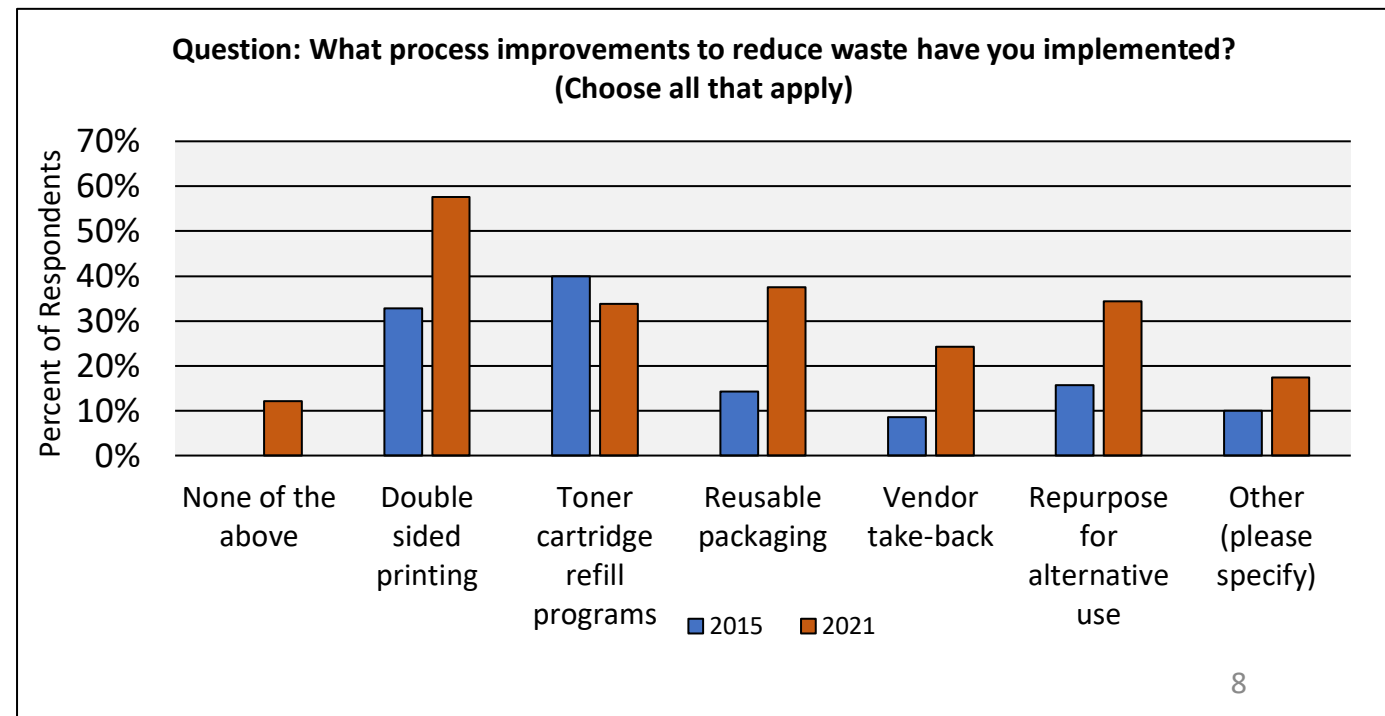


ADP Respondents (2020):
8,693

OP Respondents (2020):
5,322

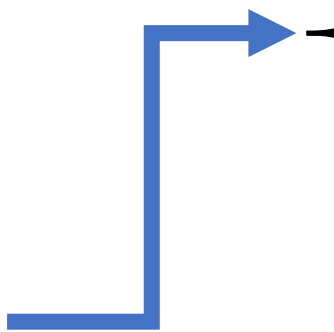
DATA SOURCES – BUSINESS SURVEY

- A survey of businesses was performed to supplement the information captured by the Annual Diversion Plans / Organics Plans
- Sent to ADP respondents (8,572 respondents that provided email)
- Most process improvements to reduce waste have increased in prevalence since the 2015 survey
- Average respondents diverted 2.2 tons per year through avoidance, reuse, resale, and donation
- The survey responses were also used to quantify the amount of waste diverted through process improvements like double-sided printing
- Integrating some of the survey questions into the ADP submittals would increase the quantity and quality of data obtained



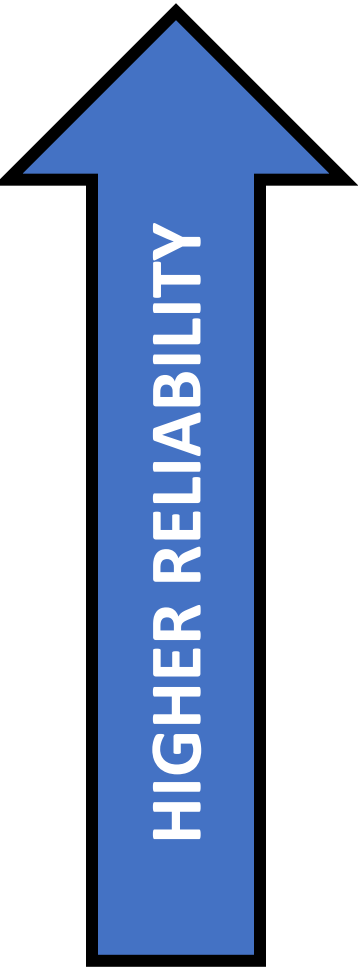
DATA SOURCES – OTHER

- Direct Contact with facilities managing waste from Austin
 - Texas Disposal Systems
 - Balcones Resources
 - Organics by Gosh
 - Austin Metal and Iron
 - Other
- Reuse facility contacts
 - Goodwill
 - Capital Area Food Bank
- Benchmark against Peer Communities



Benchmark Peer Communities		
Community	Population	Data Tracked
Ann Arbor	121,903	Residential and Commercial
Dallas	1,338,846	Residential
Phoenix	1,658,442	Residential
San Antonio	1,529,133	Residential
San Francisco	874,784	Citywide
Seattle	741,251	Residential and Commercial

DATA SOURCES – RELIABILITY COMPARISON



Residential Tonnage

ARR Collection - Quality data collected and maintained by the city

Commercial Tonnage

LICENSED HAULER REPORTS – Large haulers have good material tracking and reporting procedures, self reported

BUSINESS SURVEY – Business survey respondents provided disposal information

UNIVERSAL RECYCLING ORDINANCE – 8,500 to 9,000 responses to ADP, around 5,000 Organics Plans. Largest number of respondents, quantities may be estimated

Orphan Tonnage

REUSE FACILITY CONTACTS - Amount of diversion estimated

BUSINESS SURVEY – Some business survey respondents provided information and reuse and reduction quantities

UNIVERSAL RECYCLING ORDINANCE – Some ADP Respondents provided reduction practice information

WASTE COMPOSITION OF ARR COLLECTION PROGRAMS

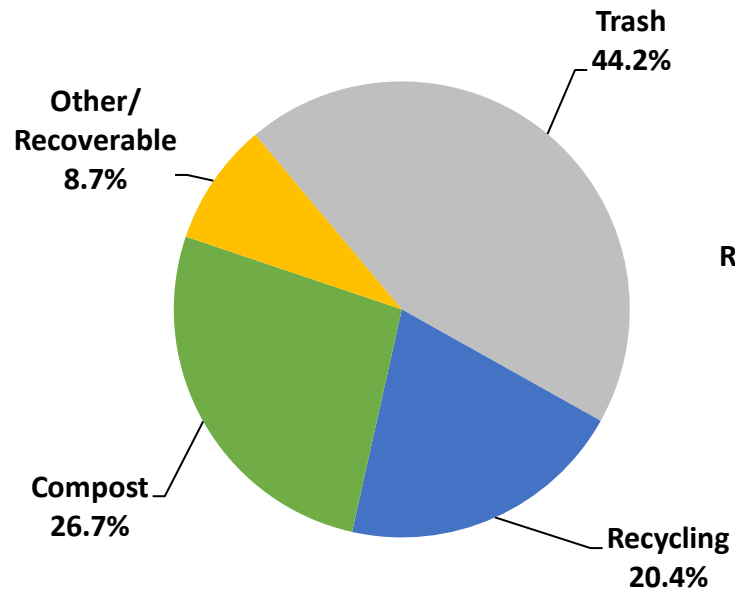
- Field sorting study was conducted in August 2021 to determine the composition of the material in the ARR-collected programs for:
 - curbside trash (43 samples),
 - curbside recyclables (50 samples), and
 - curbside compost (47 samples)



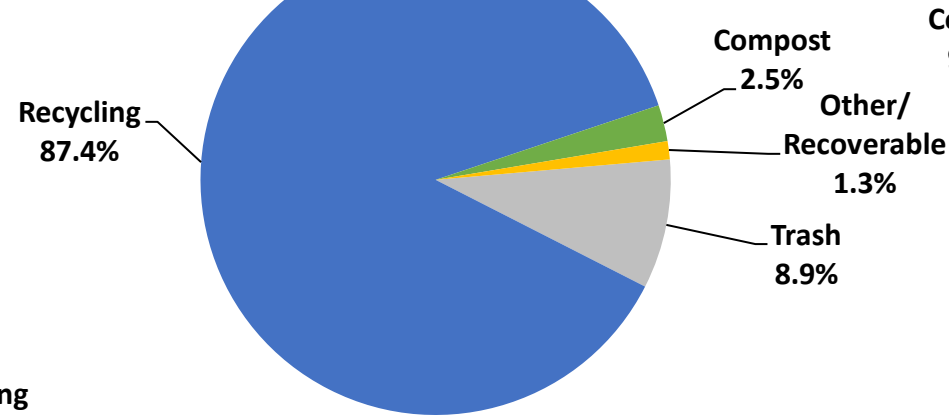
- Thanks to Texas Disposal Systems and Organics by Gosh for hosting the sorting events and providing extremely valuable assistance
- 30 samples of commercially collected trash were sorted

CAPTURE RATE OF ARR COLLECTION PROGRAMS

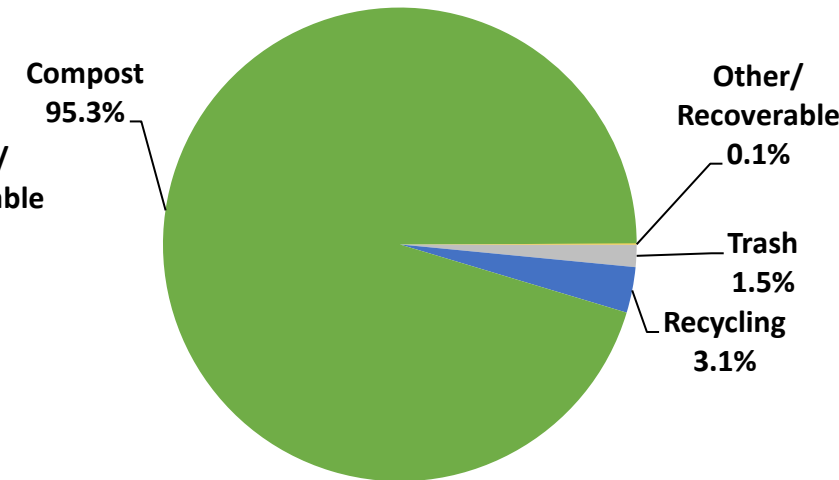
ARR Trash Composition



ARR Recycling Composition



ARR Compost Composition



*No program can reach 100% diversion, recycling processes always yield residual materials

*Other/Recoverable – textiles account for roughly half of the material in this class collected by ARR

*Sorting was performed into more categories and aggregated here for simplicity

WASTE COMPOSITION OF ARR COLLECTION PROGRAMS

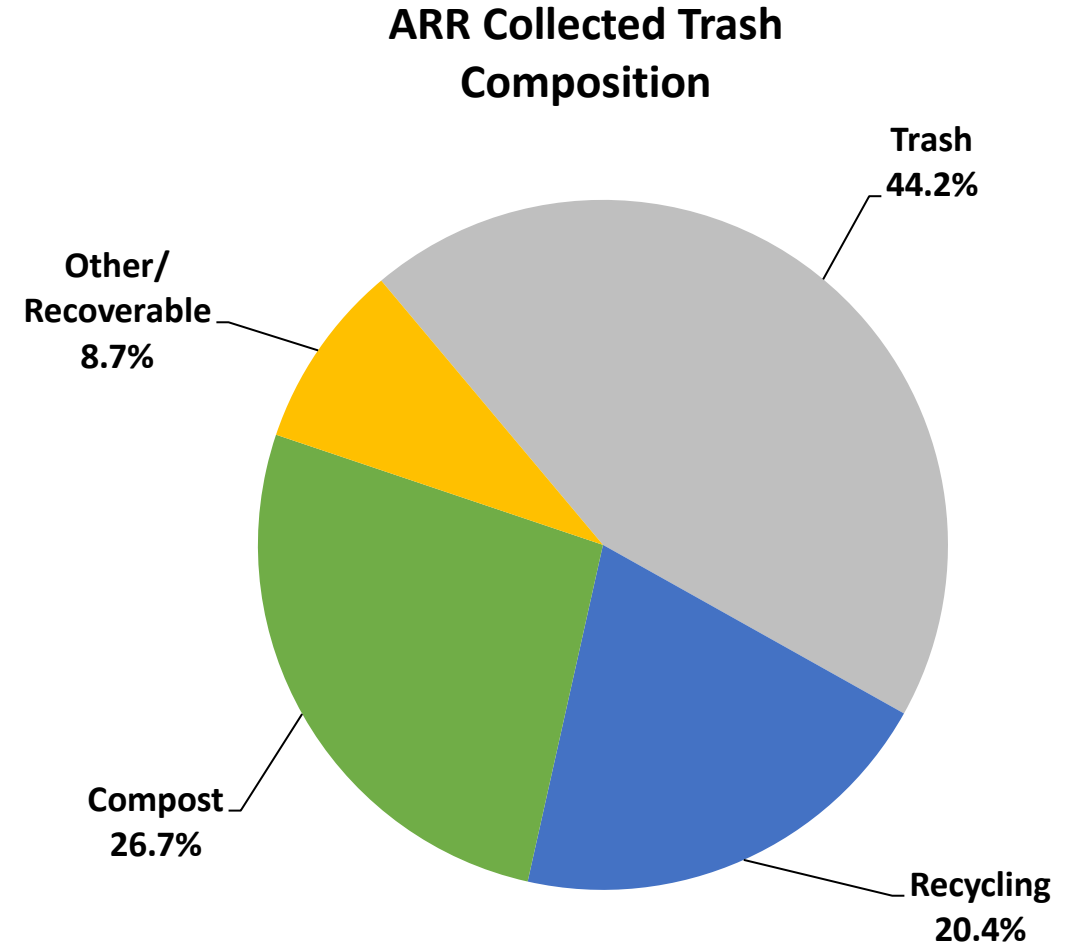
- The study determined that recycling and compost were well sorted (with less than 13% contamination)
- Over 50% of materials found in the trash stream could be diverted (as shown on previous slide)
- The overall capture rate of ARR-collected material in Austin is 68.3%
- Capture Rate is consistent across City Council districts with a range of 60% to 73% for 9 out of 10 districts
- While this is a high Capture Rate, over 30% of material generated by Austin residents is not placed in the correct material stream and therefore not diverted

Education remains a critical component for encouraging diversion and capture rate

Capture Rate	
	Capture Rate
Trash	93%
Recycling	57%
Compost	54%
Overall	68%

WASTE COMPOSITION OF ARR COLLECTION PROGRAMS

56% of material placed in trash containers could be diverted if placed in the correct cart



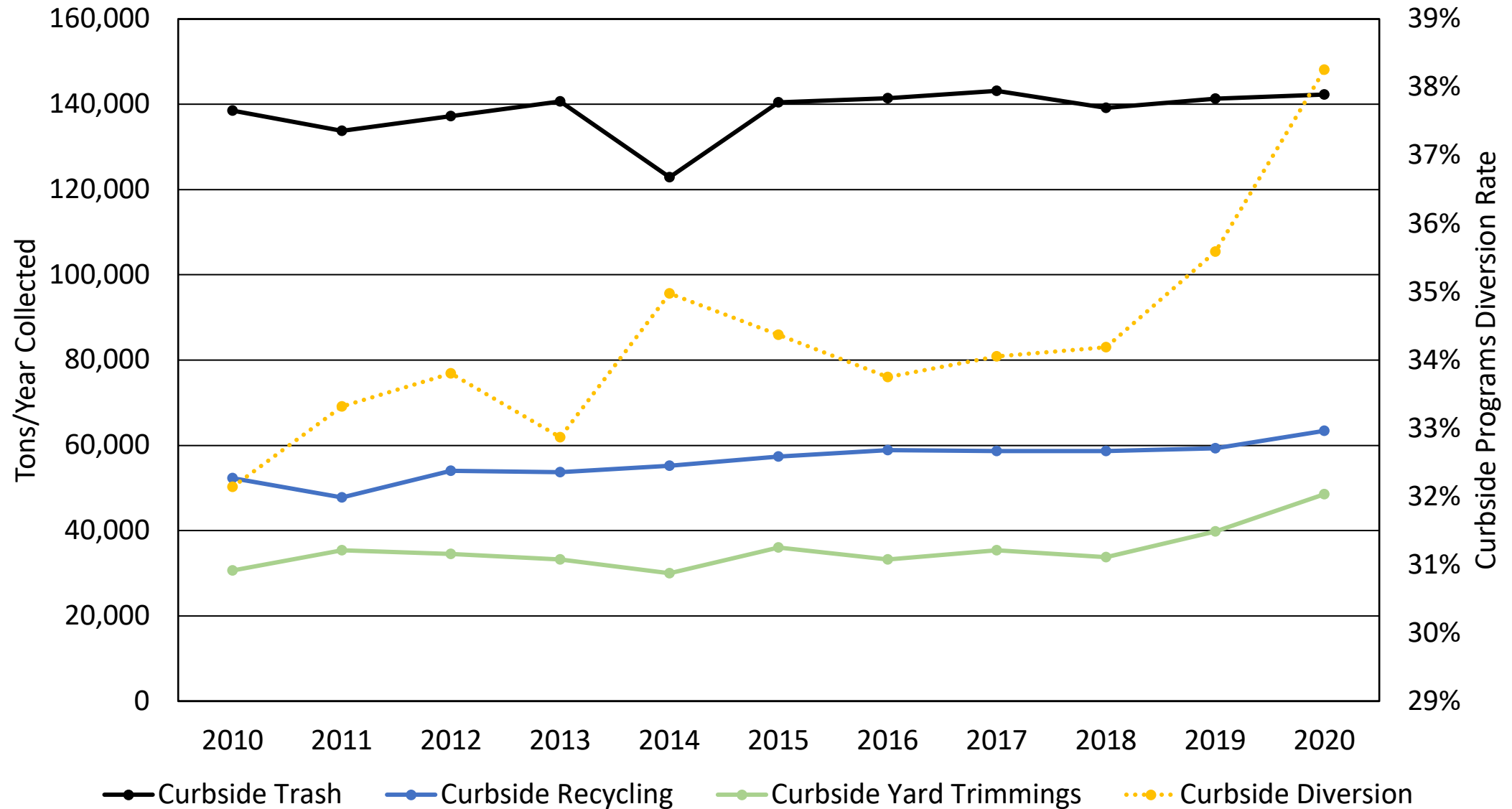
RESIDENTIAL DIVERSION RATE

- The ARR-collected material diversion rate has increased from 38% to 39.8% since the baseline studies
- While the quantity of material diverted increased since the baseline studies, the disposal rate of ARR-served households increased as well
- Quantities composted has increased significantly since the 2008/2009 rollout of cart the curbside compost program

If all ARR managed materials were diverted in 2020, Austin's citywide diversion rate would have been 44%

2020 ARR Managed Materials (Tons)	
Disposal	
ARR Residential Trash	140,546.00
Recycling Residue	12,576.65
Organics Residue	931.29
Bulky Collected	5,506.00
Recycling	
ARR Curbside Recycling	65,164.00
Residue (19.3% of ARR Residential Rec.)	-12,576.65
ARR RRDOC Total Tonnage	1,809.89
Organics	
ARR Residential Organics	50,340.00
Organics Residue (1.85% of Organics)	-931.29
Brush	1,676.00
ARR Diversion Subtotal	105,481.94
Total Generation	265,041.89
Diversion Rate	39.80%

ARR CURBSIDE DIVERSION AND COLLECTION TRENDS



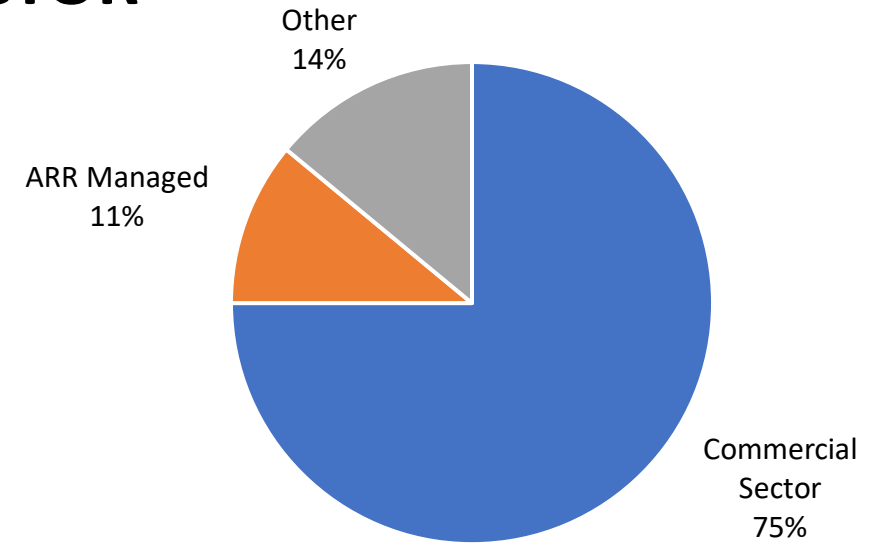
Diversion Rate shown in graph only reflects curbside collected materials (trash, recycling, and yard trimmings/compost)

COMMERCIAL SECTOR

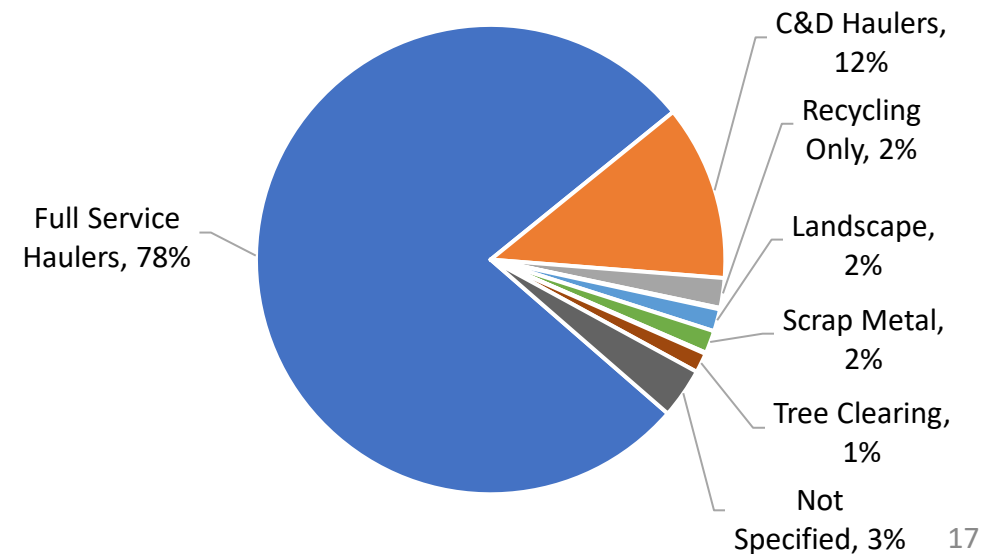
- Four full-service haulers (Texas Disposal Systems, Waste Management of Texas, Waste Connections, and Central Texas Refuse) account for 78% of the commercial waste stream
- Increasing the diversion of commercially collected materials is essential to increasing citywide diversion rate

If all commercially managed materials were diverted in 2020, Austin's citywide diversion rate would have been approximately 91%

Austin's Waste Collection by Sector

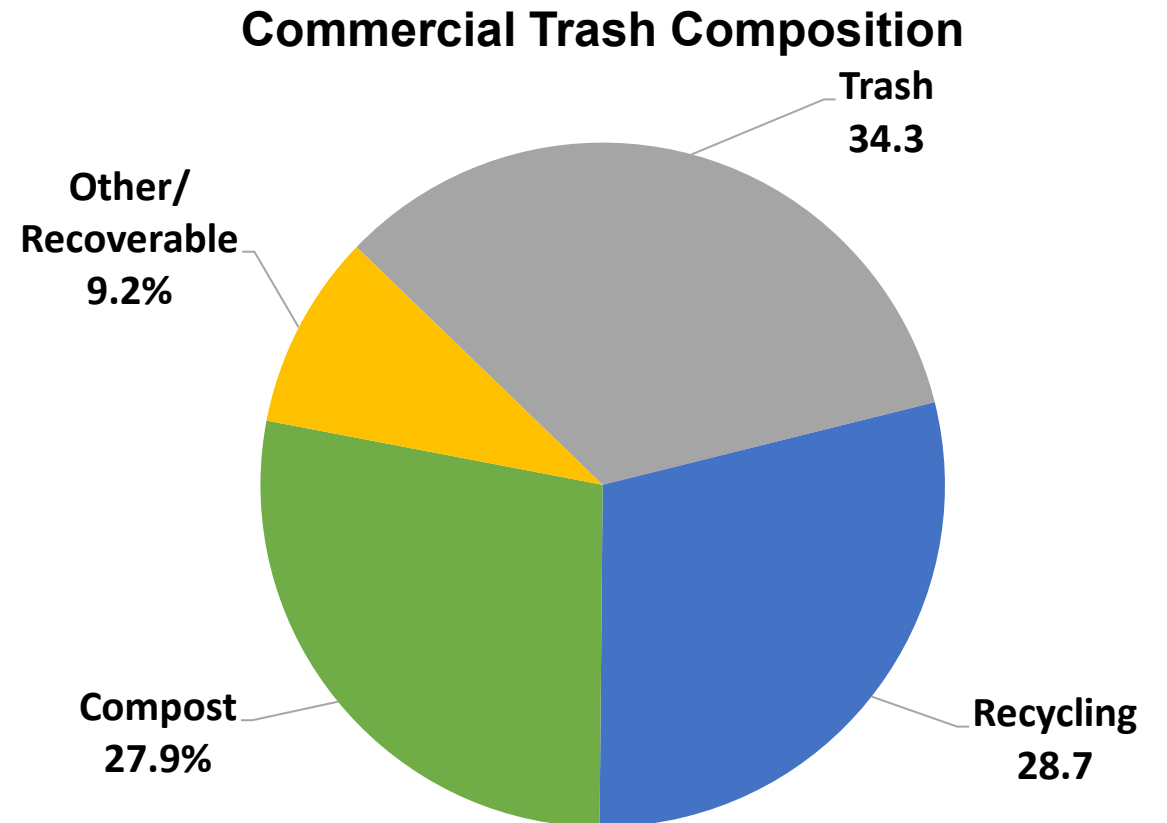


Commercial Sector Collection



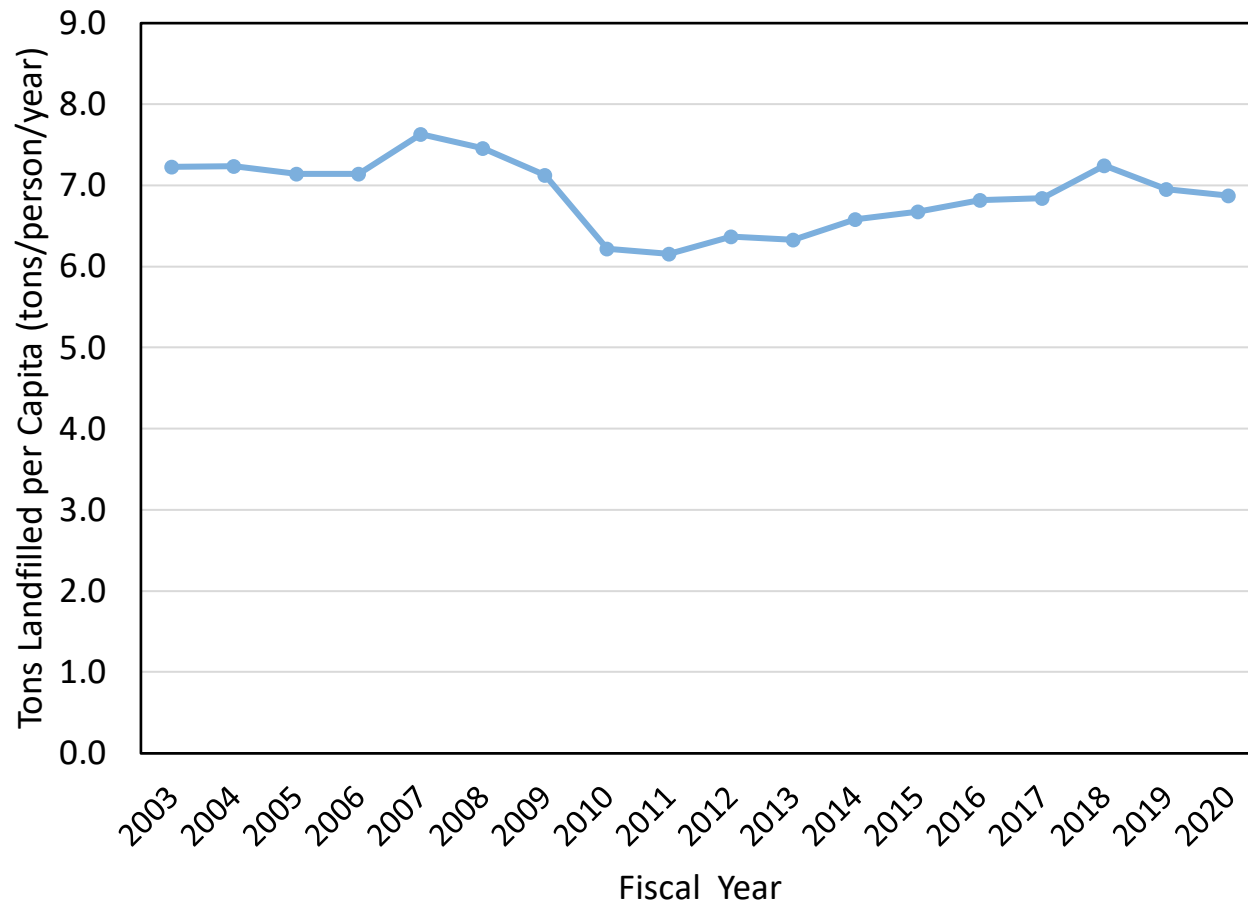
COMMERCIAL SECTOR

66% of commercially collected trash should have been disposed of differently



PER CAPITA DISPOSAL

Texas-wide Per Capita Disposal

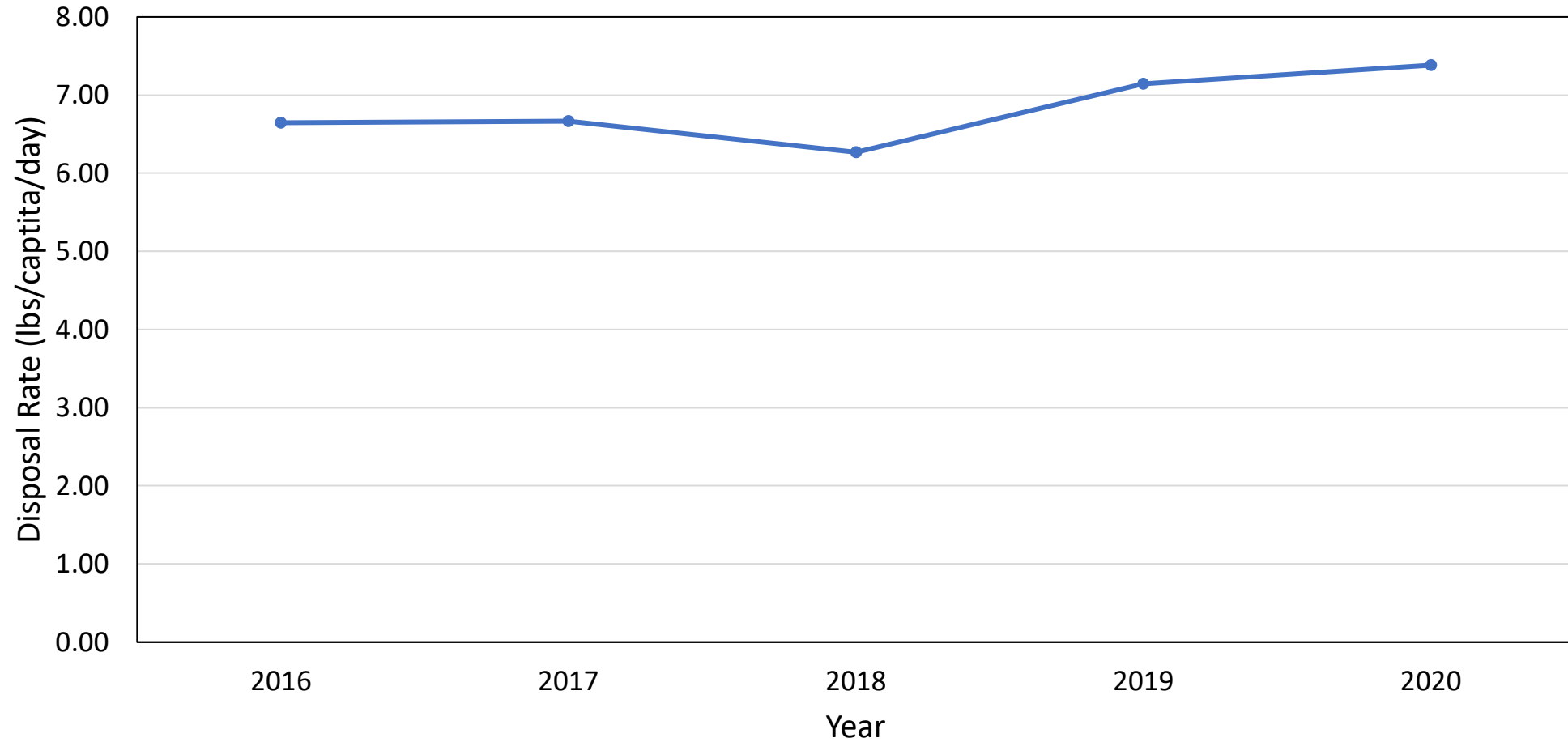


- Increased waste generation in Texas since the reference year of 2014 due to:
 - Increased Per Capita Disposal
 - Rising Population
- Increased waste generation in Austin since the reference year of 2014 due to:
 - Increased Per Capita Disposal
 - Rising Population (an increase of near 50,000 since 2014)
- Economic growth correlates with increased disposal
 - See disposal following 2008 financial crash

The TCEQ disposal rates shown above include C&D materials

PER CAPITA DISPOSAL (EXCLUDING C&D)

Austin Citywide Disposal Rate (excluding C&D materials)



Population data obtained from the US Census Bureau. 2020 population data from the Decennial census, and other years from the ACS 1-year estimates

Disposal rates calculated using a commercial recycling contamination rate of 19.3%, and a commercial organics contamination rate of 1.85%

2020 Waste Generation in Austin (tons)

	ARR Collected	Citywide
Total Generation (tons)	265,042	2,448,143
Total Disposal (tons)	159,560	1,527,621
Total Diversion (tons)	105,482	920,522
Diversion Rate	39.8%	37.6%

BENCHMARK COMMUNITIES

- Austin's diversion was compared to six peer communities
- Austin's ARR-collected diversion rate exceeded the diversion rate of 3 of 5 peer communities that tracked residential diversion communities (averaging 38.5% diversion)
- Austin's city-wide diversion rate exceeded 1 of 3 peer communities that tracked city-wide diversion
- Austin's residential diversion rate overperforms the peer communities' average
- Austin's citywide diversion rate falls below the average citywide diversion rate of peer communities
- Seattle skews the average (removing Seattle, the average Citywide Diversion among peer communities is 35.8%)

Residential Generation and Diversion	
Peer Community	Diversion Rate
Austin (2020 ARR-Collected)	39.80%
Dallas	19.00%
San Antonio	34.50%
Phoenix	20.20%
Seattle	62.00%
Ann Arbor	56.70%
Peer Community Average Diversion Rate (Residential)	38.50%
Citywide Generation and Diversion	
Peer Community	Diversion Rate
Austin (2020 Citywide)	37.60%
San Francisco	39.50%
Seattle	67.50%
Ann Arbor	30.30%
Peer Community Average Diversion Rate (Citywide)	44.20%

FINDINGS

- Education on waste sorting continues to be a critical component to encourage diversion in Austin
 - 25% of ARR-collected trash is compostable
 - 20% of ARR-collected trash is recyclable
- Significant impacts to the citywide diversion rate will require greater diversion from the commercial sector (if all ARR materials were diverted, the citywide diversion rate would still only be 44%)
- Consider modifying diversion goals to reflect what is possible to divert under current programs
 - With existing programs and generation, if all waste was sorted perfectly approximately 65% of material collected by ARR could be recycled or composted. (Below the master plan goal of 90%)
- Other cities are experiencing similar challenges
 - San Antonio had a goal of achieving 60% diversion by 2025 but reevaluated their goal after determining “that every individual household would need to sort every single item perfectly correct 100% of the time” in order to reach this goal and that “this level of sustained adherence to flawless recycling may not be attainable”¹.
 - Dallas put in place separate goals for single-family residential, multi-family residential, and commercial sectors in their 2022 Solid Waste Management Plan Update. For example, Dallas set a near-term goal of increasing recycling capture for the single-family residential sector through education.

¹ City of San Antonio Solid Waste Management Department FY 2020 Annual Report

2020 Waste Characterization, Capture Rate and Diversion Study

Thank You!



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