



# Waste Minimization Annual Report: FY22 Benchmarking

City of Dubuque

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# Waste Minimization Annual Report: Benchmarking

City of Dubuque

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## Acronyms and Abbreviations

|                     |  |
|---------------------|--|
| City                | City of Dubuque  |
| DMASWA              | Dubuque Metropolitan Area Solid Waste Agency                             |
| EPA                 | Environmental Protection Agency  |
| FY22                | Fiscal Year 2022, occurring July 1, 2021, through June 30, 2022          |
| GHG                 | Greenhouse Gas   |
| Hopper              | Represents three cubic yards, with an average weight of 200 pounds       |
| Landfill            | Dubuque Metropolitan Area Solid Waste Agency Landfill, 101 Airborne Road |
| LIPU                | Large Item Pick-Up   |
| MSW                 | Municipal Solid Waste, also known as Trash or Waste                      |
| MTCO <sub>2</sub> E | Metric Tons of Carbon Dioxide Equivalent                                 |
| PAYT                | Pay-As-You-Throw Trash   |

The City of Dubuque (City) is a thriving community that provides comprehensive solid waste services to its residents, businesses, and visitors. In planning for the future, the Dubuque 2036 Plan identifies the City as a sustainable and resilient place, inclusive and equitable, with a strong economy and expanding connectivity. The City has the specific goal to minimize waste to landfill and identify metrics to measure progress toward reaching that goal. This Waste Minimization Annual Report aims to provide a starting point to measure waste minimization to landfill metrics for use in years to come.

### **Collection Programming**

The City provides curbside collection of trash, recycling, yard waste, food scraps, and special large item pick-up to all single-family through six-plex multi-family households within the City limits. The City has a population of 59,667 people<sup>1</sup> and provides collection services to 20,466 customers.

The City has been transitioning to City-issued trash and recycling carts to increase convenience and safety. The City utilizes a pay-as-you-throw (PAYT) pricing model to incentivize customers to recycle and reduce waste. The City also offers curbside pick-up of bulky items, including household trash, and recycling for electronics, appliances, and tires.

Curbside recycling is offered at no additional charge to City customers, and yard waste and food scraps are collected, allowing customers to reduce their trash further for a small fee.<sup>2</sup> In addition to these key services, the City has also invested in education, outreach, route collection technology, and data management, all in an effort to increase waste diversion and reduce trash to landfill.

### **Landfilling Operations**

The Dubuque Metropolitan Area Solid Waste Agency (DMASWA) is an intergovernmental entity formed to manage solid waste locally. The DMASWA owns and operates the local landfill in Dubuque, where all trash from the City is disposed of. The City's waste minimization goal aims to reduce the amount of trash sent to the local landfill and extend the capacity of this existing facility.

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<sup>1</sup> "Demographics: Learn About Dubuque," City of Dubuque, Iowa, accessed 4/5/2023 [cityofdubuque.org/844/Demographics](http://cityofdubuque.org/844/Demographics)

<sup>2</sup> Attachment 1 includes pricing details for services provided by the City.

## Waste Generation

The City's customers produce significantly less trash and recycling than the national average. The average annual waste disposal per customer in Dubuque is 24.98 pounds of trash and 7.41 pounds of recycling per week. Based on 2018 data from the EPA, the average household generates 59 pounds of trash and 28 pounds of recycling per week.<sup>3</sup> The average customer in Dubuque produces only 32.39 pounds of material (trash and recycling) per week. In contrast, the national average is over two and a half times that amount at 87 pounds per week. Dubuque customers recycle approximately 23% of the material they produce,<sup>4</sup> while the national average household recycles 32% of all waste generated. Customers in the City are producing far less waste (both trash and recycling) than the average, indicating that the diversion programs discussed in this report are effective. Given the low quantity of trash and recycling produced, increasing diversion in the future will be more challenging, given that residents are already producing less trash than the national average.



National estimates from 2018 EPA data, based on an average of 2.53 people/household.

## Waste Minimization Goals

The City has identified specific goals to help track its progress towards waste minimization to landfills, including annual goals to increase waste diversion to landfill, reduce trash per customer, and incorporate greenhouse gas (GHG) emissions reductions into waste minimization outcomes. Each goal has a quantifiable outcome to be measured annually by incorporating data collected by the City. Benchmarking Fiscal Year 2022 (FY22), July 1, 2021, through June 30, 2022, provides a starting point to assess the current conditions in the City and provides clear metrics to measure against in the years to come.

<sup>3</sup> National Overview: Facts and Figures on Materials, Wastes and Recycling, United States Environmental Protection Agency, accessed 4/14/2023  
[epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials](http://epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials)

<sup>4</sup> Diversion rate is a calculation of total recycling, organics, electronics, appliances, and tires (diversion) compared to total waste generated (all trash and recycling).

## By The Numbers

Key metrics and figures from FY22 provide a benchmark for future efforts for waste minimization in the City.<sup>5</sup>



## Benchmarking

The evaluation of FY22 illustrates the depth of the programs the City offers its customers and how programs can work to meet waste minimization goals in the future. The City's current data tracking offers metrics to monitor progress and provides insights into opportunities for additional waste diversion in the future. This report serves as a foundation for future planning and a comparison to assist the City in making data-driven operational and programmatic decisions to advance waste minimization to landfill efforts.

By benchmarking the current programs, impact metrics, and unique efforts already implemented, the City can better understand opportunities to advance waste minimization to landfill goals in the future.

<sup>5</sup> "Demographics: Learn About Dubuque," City of Dubuque, Iowa, accessed 4/5/2023 [cityofdubuque.org/844/Demographics](http://cityofdubuque.org/844/Demographics)

## CURRENT ACTIVITIES BENCHMARKING

In order to advance waste minimization, the City has identified specific goals for waste reduction and annual metrics for incremental changes. This benchmarking report serves as a framework to understand the existing state of trash to the landfill, diversion, recycling, and GHG emissions based on data from FY22. Future progress towards waste minimization will be measured based on the data in this report, including specific annual quantitative goals. The City provided data included is based on its existing extensive data management for City-provided services. Future reports will also include new data and additional metrics that become available as a result of new technology and system improvements implemented by the City.

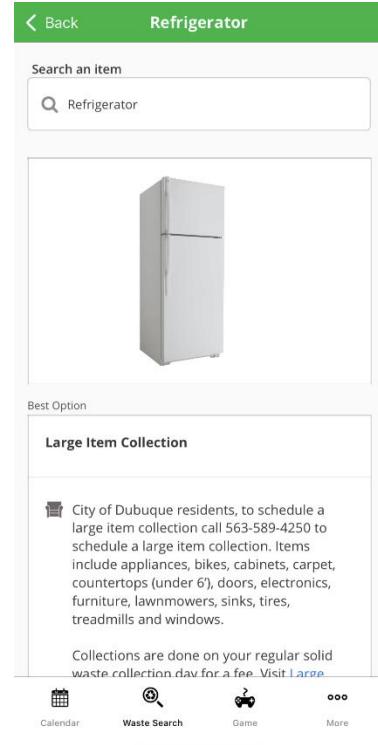
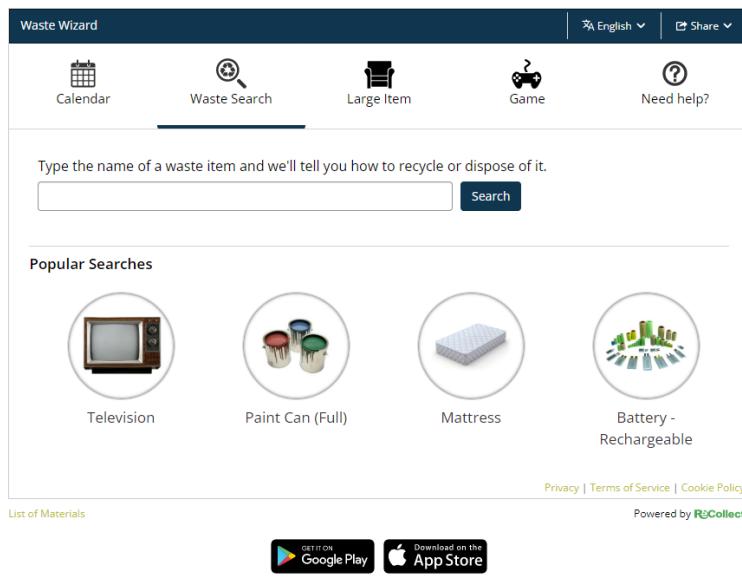
The City offers comprehensive curbside collection of trash, recycling, yard waste, food scraps, and special large item pick-ups (LIPU) for residential customers. Stakeholder outreach and education provide information to customers and aim to improve participation and efficiencies in the programs.

### Stakeholder Involvement & Community Engagement

Engaging with the community and involving local stakeholders is a priority of the City and will continue to be important in efforts to advance waste minimization initiatives and goals. The City shares educational information related to solid waste, sends direct mailing educational pieces, and utilizes the City's website and social media. In FY22, the City posted 18 times on its social media specific to solid waste, and those posts received 340 likes and 221 shares. Educational materials are available on the City's website in multiple languages, including English, Spanish, and Marshallese, to best serve Dubuque's diverse populations. Between January and June 2022, the City's curbside collection website page received an average of 1,149 views per month. The City also invested in the RETHink Waste Dubuque app to provide easy and convenient educational and collection information specific to their customers. In FY22, the RETHink Waste Dubuque search tool received 8,133 hits, averaging 678 hits per month.



Figure 1: REThink Waste Dubuque Waste App



City solid waste staff attends community events, including the farmers' market "touch a truck" event, to celebrate National Public Works Week. These events allow the City to engage with residents about recent programs, educate them about solid waste practices, and answer questions. During the 2022 farmers' market event, the City's new automatic side-loading technology was highlighted to educate about efficient collection services, including demonstrating how the City-issued carts interact with the technology.

City staff also attend a minimum of two neighborhood association meetings each year to connect directly with residents and address their specific concerns or questions. In FY22, City staff attended four neighborhood association meetings, two classroom presentations, a recycling panel, and a sustainability fair. In future years, City staff will continue to quantify these important community engagement efforts by recording the number of events that staff attend and estimating how many residents they interact with.

Figure 2: Dubuque City Staff at "Touch a Truck" Event



The City's customer service operations track data of significant information related to service issues. Customer service and engagement are critical to the success of the City's program. In FY22, the City specifically addressed approximately 17,233 customer service phone calls related to solid waste. Customers receive violation notifications on their carts when drivers note issues with trash set-outs, including too much trash or large items.

Figure 3: Customer Service Metrics

| Fiscal Year | Total Number of Customers | Number of Customer Service Calls |
|-------------|---------------------------|----------------------------------|
| FY22        | 20,466                    | 17,233                           |

Figure 4: Violation Notification Sticker



The City has the opportunity to expand its reach to stakeholders and community engagement in the future. Identifying and investing in additional educational activities could provide benefits in advancing waste minimization to landfill goals. Using existing data, such as frequent questions received or improper set-out issues, such as cart location, could provide opportunities for efficient education to address common concerns. Education specific to waste reduction practices, proper and increased recycling efforts, and increasing participation in other recycling programs will help advance waste minimization goals.

## Improved Recycling

The City offers curbside recycling at no additional charge to residents living in single-family homes through six-plex multi-family households for the collection of plastics (#1-#5), cardboard, scrap metal, and paper. Residents wishing to participate must request containers from the City by calling or completing an online request. The City currently uses a mix of 18-gallon bins used by approximately 10,000-15,000 households, and 96-gallon wheeled carts used by approximately 3,400 households. Each year, the City purchases 400 carts to be distributed to customers that request the larger collection option. The demand for larger carts is rapidly outpacing the available supply, and many customers must wait extended periods to receive their larger recycling carts.

Recycling tonnage is likely to increase as additional carts become available to customers. The City has observed that households with 96-gallon carts recycle significantly more materials than households with 18-gallon bins.

Figure 5: Comparison of Recycling 96-gallon Cart and 18-gallon Bin



The City provides a curbside collection of food scraps. This convenient service offers customers additional waste diversion by reducing the amount of trash they produce by composting food waste. The City had 532 food scrap customers in FY22.

The City also offers curbside yard waste collection. Yard waste participation is difficult to quantify because the City offers multiple service options, including single-use brown yard waste bags, yearly decals for 35-gallon containers, or City-issued 65-gallon carts. Yard waste tonnage is the best option to track the diversion of this material annually. Extreme weather events and droughts impact yard waste collection and may impact annual tonnage in the future.

### Incentivizing Waste Reduction

The City has a pay-as-you-throw (PAYT) pricing model for trash collection that charges customers based on the volume of trash they dispose of each week. This pricing model incentivizes producing less trash and selecting the right size cart for the customer's need. The City began distributing 35-gallon carts to many customers in FY22, and future reports will include metrics regarding additional cart distribution and details about the PAYT pricing model for trash collection. Monthly fees for alley carts vary slightly from street cart collection. Pricing for LIPUs is dependent on the materials collected and the volume of material.

Figure 6: Trash Carts in Service in FY22

| Basic Service Customers without Carts | 35 Gal. Trash | 48 Gal. Trash | 64 Gal. Trash | 96 Gal. Trash | Total Carts |
|---------------------------------------|---------------|---------------|---------------|---------------|-------------|
| 14,303                                | 922           | 1,170         | 3,055         | 1,021         | 6,163       |

## Diversion of Significant Economic or Environmental Value

The City provides curbside LIPU for a fee to residential customers. This service is convenient for customers and allows the City to recycle bulky items, including appliances, electronics, and automobile tires. Large items that cannot be recycled are taken to the landfill. In FY22, the City provided 3,324 LIPUs, collecting approximately 515.4 tons of material, based on an average three cubic yard hopper weight of 200 pounds. City staff collected items with a separate truck and calculated the average weight of each hopper, resulting in an average weight of 200 pounds per hopper. The total tonnage includes the recycling of 750 televisions and 288 appliances. The annual LIPU total tonnage has increased each year since FY18 and continues to be a highly utilized service by customers.

Figure 8 Large Item Pick-Up Metrics

| Fiscal Year               | FY22         |
|---------------------------|--------------|
| Total LIPU Events         | 3,324 events |
| Total LIPU Landfill Trash | 515.4 tons   |
| Total LIPU Recycling      | 66.7 tons    |
| Total LIPU Tonnage        | 582.1 tons   |

Figure 7 Large Item Pick-Up Service Collection



## Community of Dubuque Block Grant Program

In FY22, the City provided additional service for LIPU through the Community of Dubuque Block Grant Program. This program financed LIPU services to residential properties located in low-income census blocks within the community. Funding from this grant program provided 1,383 pick-up events and collected 334,400 pounds of material. Participants were encouraged to clean out their basements, yards, and attics and dispose of items via curbside collection provided at no cost to the customers.

## Data Management

The City's current data management is detailed and includes key findings for many aspects of the City's residential solid waste management programs. Consistent data collection and accuracy will provide beneficial comparisons going forward, and new metrics and data collection can be added as new programs are implemented. If data collection errors or inconsistencies are identified, those should also be corrected and accounted for.

In data management, it will also be critical to account for changes within the current operating system. Specifically, as the City transitions from recycling collection predominantly by bins to increased numbers of larger carts, data should account for that change. The City expects to see an increase in recycling tonnage and potentially increased participation as a result. Future years

will also include participation rate estimations based on available data, and the City may explore new ways to better track participation rates.

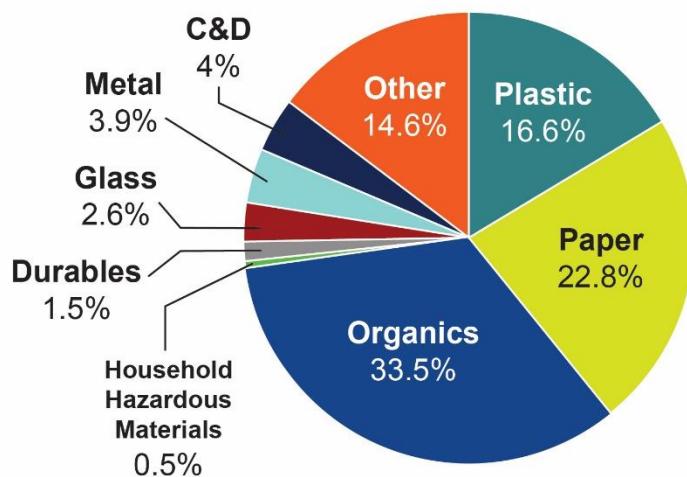
This benchmarking report aims to provide a starting point for evaluating waste minimization efforts and provide a basis for goal setting and measuring progress into the future. Additional opportunities may be apparent for new or different data collection and metrics in the future.

## Additional Diversion Potential for Recycling and Organics

### Targeted Materials

The Iowa Department of Natural Resources completed the 2017 Iowa Statewide Waste Characterization Study to analyze waste disposed of in the state. DMASWA was one of ten facilities selected for participation in the study. Figure 10 below summarizes the residential statewide municipal solid waste (MSW) composition.

Figure 9: Residential Statewide MSW Material Composition<sup>6</sup>



The study identified the top five materials components in MSW that comprised the largest portion of overall materials, listed below. Similar materials were also some of the top materials in institutional, commercial, and industrial waste.

### Statewide Top Five Material Composition<sup>7</sup>

1. Food waste, including both food waste packaged and loose: 17.9%
2. Plastic film, including retail shopping bags and plastic film: 7.6%
3. Compostable Paper: 6.8%
4. Mixed Recyclable Paper: 6.5%
5. Other Organics: 5.6%

<sup>6</sup>2017 Iowa Statewide Waste Characterization Study. Iowa Department of Natural Resources, SCS Engineers, December 2017. [https://www.iowadnr.gov/Portals/idnr/uploads/waste/faba\\_wastecharacterization2017.pdf](https://www.iowadnr.gov/Portals/idnr/uploads/waste/faba_wastecharacterization2017.pdf)

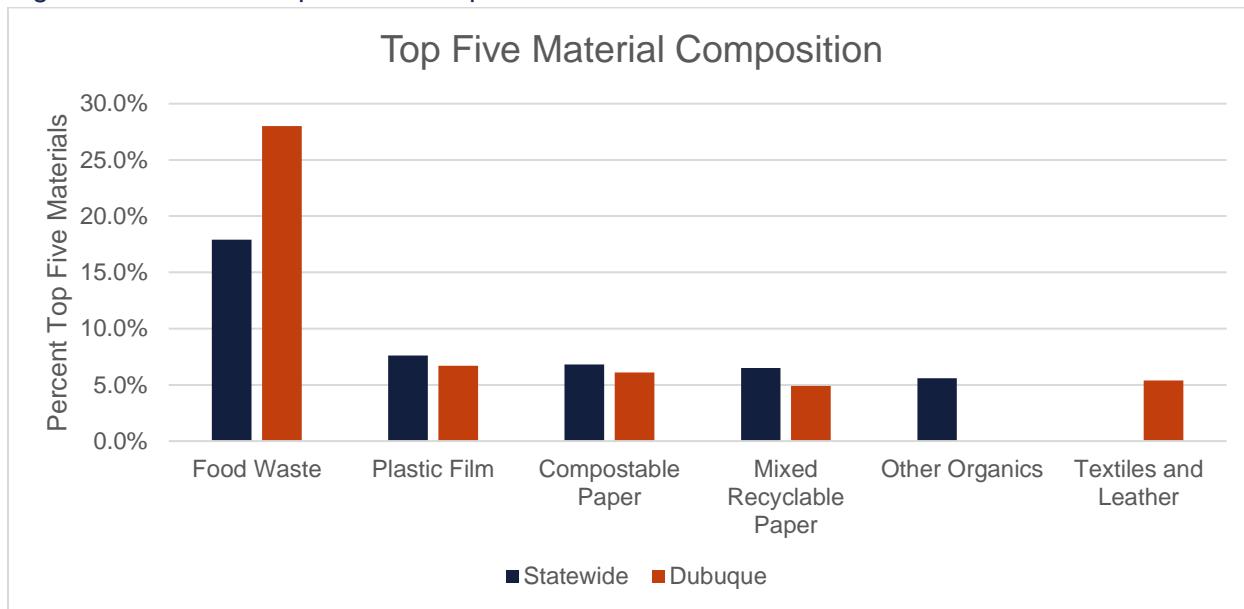
<sup>7</sup> 2017 Iowa Statewide Waste Characterization Study. Iowa Department of Natural Resources, SCS Engineers, December 2017. [https://www.iowadnr.gov/Portals/idnr/uploads/waste/faba\\_wastecharacterization2017.pdf](https://www.iowadnr.gov/Portals/idnr/uploads/waste/faba_wastecharacterization2017.pdf)

The study included 11 residential samples from the City of Dubuque's collection service. It resulted in similar top five materials comprising the largest portion of the overall materials; however, Dubuque's samples included textiles and leathers and did not include other organics (although this was the sixth most prevalent item).

### Dubuque Top Five Material Composition<sup>8</sup>

1. Food waste, including both food waste packaged and loose: 28.0%
2. Plastic film, including retail shopping bags and plastic film: 6.7%
3. Compostable Paper: 6.1%
4. Textiles and leather: 5.4%
5. Mixed Recyclable Paper: 4.9%

Figure 9 Material Composition Comparison



Material composition data can provide insight regarding what materials to target for diversion, including materials that can be diverted from the landfill via existing recycling, yard waste, or food scraps collection programs. Given the high percentage of food waste in the trash stream, a focus on reducing food waste to help reach the goal of minimizing the amount of waste generated for management. Increasing usage of the food scraps collection program may also increase diversion of this material from the landfill. Based on the study, the trash included recyclable materials such as mixed recyclable paper, plastics #1-#5, newsprint, and glass. All these materials can be recycled either curbside in the City or at drop-off locations for glass recycling.

<sup>8</sup> 2017 Iowa Statewide Waste Characterization Study. Iowa Department of Natural Resources, SCS Engineers, December 2017. [https://www.iowadnr.gov/Portals/idnr/uploads/waste/faba\\_wastecharacterization2017.pdf](https://www.iowadnr.gov/Portals/idnr/uploads/waste/faba_wastecharacterization2017.pdf)

The City offers curbside collection of food scraps that could be further utilized to reduce food waste going to the landfill. Currently, the City has 532 food waste customers, representing only 2.6% of all customers. Increasing participation and investment in the program's marketing could provide long-term waste reduction benefits and advance waste minimization to landfill goals. Additionally, customers in the City produce low quantities of curbside waste (trash and recycling) as compared to the national average, meaning that food waste may be a higher percentage of overall waste, given the lesser quantity to begin with. Dubuque customers are already making efforts to reduce their trash, as shown by this data, and the remaining waste appears to be high in food waste based on the state report. Focusing efforts on reducing food waste produced and thus minimizing waste could be beneficial as well.

Results also indicate that some recyclable materials are going to landfills, including cardboard, paper, plastics, scrap metal, and glass. The City has a well-established program for collection and recycling separation. The recyclable materials in MSW represent an economic loss and inefficiency within the system. Increased education about proper recycling could provide benefits and convenient access to curbside recycling. Roughly two percent of Dubuque's MSW composition was glass deposit containers that could be returned to stores or redemption centers as part of the Beverage Container Control Law. Glass recycling presents an opportunity to divert this material from the trash to well established infrastructure that is in place for easy recycling.

The City could consider completing its own waste material composition studies independently of the state efforts. Annual studies could provide a more detailed account of waste streams in the City's collection and identify materials to target for diversion either with existing diversion options or with implementing new diversion programs.

## QUANTITATIVE BENCHMARKING

The City has identified three specific waste minimization goals. The information included is the benchmarking for current conditions based on FY22 to be used in subsequent years to measure goal progression.



### Goal #1: Increase the overall waste diversion rate, including recycling, yard waste, and food scraps.

The waste diversion rate includes all residential waste collected by the City from customers living in single-family homes through six-plex multi-family households. This represents the best available data from the City and will be reported consistently in future reporting years.

Figure 10: FY22 Waste Diversion Rate

| Fiscal Year | Total Curbside Waste Generation (tons) | Total Trash (tons) | Total Recycling (tons) | Total Organics (tons) | Total TVs (tons) | Total Appliances (tons) | Total Tires (tons) | Total Diverted (tons) | Diversion Rate |
|-------------|--|--------------------|------------------------|-----------------------|------------------|-------------------------|--------------------|-----------------------|----------------|
| FY22        | 17,230.46                              | 13,289.70          | 2,831.70               | 1,042.60              | 44.87            | 20.78                   | 0.81               | 3,940.76              | 22.87%         |

In FY22, the City's waste diversion rate is 22.87%, accounting for diversion from landfilling via curbside recycling collection, curbside organics (yard waste and food scraps) collection, and LIPU curbside collection of televisions, appliances, and tires.

The City has identified the specific goal to increase diversion by one percent annually. The strategies and methods for increasing waste diversion detailed in this report have the potential to increase waste diversion rates directly.



### Goal #2: Reduce per customer annual waste disposal based on landfilled waste and total annual waste generation

The City serviced 20,466 customers in FY22 and tracked annual waste generation, including trash and all recyclables. Each customer represents one household, ranging from single-family homes to six-plex multi-family households.

Figure 11: FY22 Per Customer Annual Waste Disposal

| Fiscal Year | Total Number of Customers | Total Curbside Waste Generation (tons) | Total Trash Tonnage to Landfill | Per Customer Trash Annually (pounds) | Diverted Tonnage (all recyclables) | Per Customer Recycling Annually (pounds) |
|-------------|---------------------------|--|---------------------------------|--------------------------------------|------------------------------------|--|
| FY22        | 20,466                    | 17,230.46                              | 13,289.70                       | 1,298                                | 3,940.76                           | 385                                      |

In FY22, the per customer waste disposal was approximately 1,300 pounds of trash and approximately 385 pounds of recycling. On average, customers generated 24.98 pounds of trash and 7.41 pounds of recycling per week. This data is specific to the curbside collection

provided by the City. Based on 2018 data from the EPA, the average household (estimating 2.53 people per household) generates 59 pounds of trash and 28 pounds of recycling per week, representing a diversion rate of approximately 32%.<sup>9</sup> The Recycling Partnership estimated the average single-family household generates 14.8 pounds of recyclable materials each week based on data from 2020.<sup>10</sup>

Based on an estimate of 2.5 people per customer account (or household), Dubuque residents produce 1.85 pounds of solid waste per day. In comparison, the average in the state of Iowa is 4.8 pounds of solid waste per person per day<sup>11</sup> and Wisconsin averages 6.6 pounds of solid waste per person per day.<sup>12</sup> The City's customers produce significantly less trash and recycling than other regional and national averages, indicating that waste reduction efforts are effective in reducing waste. Dubuque customers generate 77% trash and 23% recycling, while the national average is 68% trash and 32% recycling.

This data suggests that additional waste diversion, including reducing annual waste disposal, will be more challenging as the City is already working with a low quantity of solid waste generated. The City's goal is to decrease the yearly waste disposal rate by one percent per customer. Increasing waste diversion and implementing the strategies discussion has the potential to help the City reach this waste minimization goal.



### Goal #3: Incorporate greenhouse gas reduction initiative into waste minimization planning using WARM analysis specific to waste diversion efforts.

The EPA's Waste Reduction Model (WARM)<sup>13</sup> provides high-level estimates of potential greenhouse gas (GHG) emissions reductions, energy savings, and economic impacts related to waste management practices. The model compares a baseline scenario, where all materials are disposed of in a landfill, with an alternative scenario, where some materials are diverted via recycling, composting, anaerobic digestion, waste-to-energy, or source reduction. WARM calculations show the benefits of diverting material from landfilling.

WARM is a policy and planning tool to support voluntary GHG measurement but does not calculate actual emissions. In some cases, results in WARM show a negative value for GHG emissions. This result indicates that managing the material using the selected diversion practice results in avoiding GHG emissions compared to the baseline scenario of landfilling organic waste and recyclables.

<sup>9</sup> *National Overview: Facts and Figures on Materials, Wastes and Recycling*, United States Environmental Protection Agency, accessed 4/14/2023  
[epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials](https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials)

<sup>10</sup> *2020 State of Curbside Recycling Report*, The Recycling Partnership, February 13, 2020  
[recyclingpartnership.org/wp-content/uploads/dlm\\_uploads/2020/02/2020-State-of-Curbsside-Recycling.pdf](https://recyclingpartnership.org/wp-content/uploads/dlm_uploads/2020/02/2020-State-of-Curbsside-Recycling.pdf)

<sup>11</sup> *Solid Waste Section*, Iowa Department of Natural Resources, accessed 5/21/2023 [iowadnr.gov/Environmental-Protection/Land-Quality/Solid-Waste](https://iowadnr.gov/Environmental-Protection/Land-Quality/Solid-Waste)

<sup>12</sup> *Recycling Facts and Figures*, Wisconsin Department of Natural Resources, accessed 5/22/2023  
[dnr.wisconsin.gov/topic/Recycling/facts.html](https://dnr.wisconsin.gov/topic/Recycling/facts.html)

<sup>13</sup> *Waste Reduction Model (WARM)* Version 15, United States Environmental Protection Agency, accessed 4/5/2023, [epa.gov/warm](https://www.epa.gov/warm)

The model was developed based on inputs specific to the City for FY22. The following inputs and assumptions were used for the model.

Figure 12: WARM Inputs

| Material                 | Quantity in FY22 (tons) | Baseline Scenario Management | Alternative Scenario Management |
|--------------------------|-------------------------|------------------------------|---------------------------------|
| <b>Mixed MSW</b>         | 13,289.7                | Landfilled                   | Landfilled                      |
| <b>Mixed Recyclables</b> | 2,831.7                 | Landfilled                   | Recycled                        |
| <b>Mixed Organics</b>    | 1,042.6                 | Landfilled                   | Composted                       |
| <b>Mixed Electronics</b> | 65.7                    | Landfilled                   | Recycled                        |
| <b>Tires</b>             | 0.8                     | Landfilled                   | Recycled                        |

The model includes other inputs specific to the City, including the distance to the landfill, materials recovery facility, and composting site from the City. WARM also accounted for the landfill gas recovery system in place at the landfill.

The WARM results in the table below compare the GHG emissions produced when all materials are landfilled (Baseline Scenario) and the Alternative Scenario in which recyclable materials are recycled. The model indicated that the City's efforts to recycle and compost have resulted in a net decrease in GHG emissions of 7,619 metric tons of carbon dioxide equivalent (MTCO<sub>2</sub>E).

Figure 13: WARM GHG Emissions Data

| Fiscal Year | GHG Emissions from Baseline | GHG Emissions from Alternative Management | Incremental GHG Emissions   |
|-------------|-----------------------------|---|-----------------------------|
| FY22        | 1,094 MTCO <sub>2</sub> E   | (6,525) MTCO <sub>2</sub> E               | (7,619) MTCO <sub>2</sub> E |

The total change in GHG emissions represents the emissions savings that result from the City's current waste diversion programs. These emissions savings are equivalent to the following:

-  Removing annual emissions from 1,618 passenger vehicles, or one passenger vehicle for every 13 customers
-  Conserving 857,295 gallons of gasoline
-  Conserving 317,449 cylinders of propane used for home barbeques

The City aims to reduce GHG emissions by meeting its other waste diversion goals. Emission reductions can be monitored annually using WARM. The model can also be used to document changes in the City's waste reduction strategy over time, including source reduction.

## SUMMARY AND NEXT STEPS

The City continues to take active steps to advance waste reduction and work towards reaching its waste minimization goals. This benchmarking report highlights existing efforts and incorporates detailed data to identify current metrics. Identifying the diversion rate, annual waste disposal per customer, and GHG emissions data for FY22 will allow the City to track progress on its goals in future years. Data collection and metric tracking will be important as the City continues refining existing programs and implementing new waste reduction efforts.

**Appendix 1: City of Dubuque Curbside Collection Fees FY22**  
**(July 1, 2021 – June 30, 2022)**

| City of Dubuque Curbside Collection Fees FY 2022 |  |                   |
|--|--|-------------------|
| Service  | Revenue Type   | FY22 Rates        |
| Trash  | 35 gallon cart/bag/can   | \$15.38           |
|  | 48 gallon cart   | \$17.72           |
|  | 64 gallon cart   | \$20.65           |
|  | 96 gallon cart   | \$29.00           |
|  | 35 gallon alley cart   | \$15.38           |
|  | 48 gallon alley cart   | \$15.38           |
|  | 64 gallon alley cart   | \$16.65           |
|  | 96 gallon alley cart   | \$24.00           |
|  | Single-Use Sticker for Excess Trash  | \$1.50            |
|  | Annual Yard Waste Decal  | \$35.00           |
| Yard Waste & Food Scraps                         | 64 gallon cart   | \$11.00           |
|  | 48 gallon K-12 Schools   | \$8.00            |
|  | Commercial 13 gallon food scrap  | \$4.00            |
|  | Commercial 48 gallon food scrap  | \$15.00           |
|  | Commercial 64 gallon food scrap  | \$20.00           |
|  | 13 gallon food scrap   | \$1.00            |
|  | Leaf Rake-Out  | \$20.00           |
|  | Yard waste brush ties  | \$1.30            |
|  | single-use yard waste stickers   | \$1.30            |
|  | Recycling Only – Residential   | \$6.00            |
| Recycling  | Recycling – Commercial   | \$6.00            |
|  | 1 Hopper - 3 Cubic Yd of Trash   | \$10.00           |
| Large Item                                       | Additional Hoppers   | \$12.50           |
|  | Large Electronics & Appliances<br>(Stoves, TVs, laptops, dishwashers, Refrigerators, dehumidifiers, dryers, microwaves, trash compactors, water heaters, furnaces, freezers) | \$10.00 - \$20.00 |
|  | Tires  | \$6.00            |
|  | Off Route/Non Customer Charge  | \$10.00           |