



# LOUISVILLE METRO GOVERNMENT

## Solid Waste Study

Recommendations for improving recycling,  
increasing reuse, and reducing waste in  
Louisville/Jefferson County.

Final Report

January 2018



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Reports from Previous Study Phases

This document is Volume 3 of a three-part report. The previous volumes are presented separately:

- Volume 1. Waste Characterization Study
- Volume 2. Collection System Assessment

# 1. EXISTING CONDITIONS

This chapter summarizes existing conditions for the solid waste system in Jefferson County. Existing conditions include current plans, policies, and regulations; a description of the existing collection and processing infrastructure; results from a waste characterization study; and an assessment of current program performance. More information is provided in the following sections:

- Section 1.1: Current plans, policies, programs, and solid waste regulations
- Section 1.2: Existing collection and processing system
- Section 1.3: Diversion performance and disposed waste

## 1.1 Current Plans, Policies, Programs, and Solid Waste Regulations

Louisville Metro has adopted a variety of plans, policies, and regulations related to diversion and waste management. Louisville Metro also conducts a variety of education, outreach, and other programs to promote diversion.

### 1.1.1 Solid Waste Related Goals, Regulations, and Policies

Louisville Metro has published the following solid waste, recycling, and sustainability plans since 2012:

- Sustain Louisville: Louisville Metro Sustainability Plan (March 2013)
- Mayor Greg Fischer's Six-Year Strategic Plan
- Recycling Charter (developed in 2012)
- Louisville/Jefferson County Metro Government Solid Waste Management Plan 2013-2017

These documents support Louisville Metro's ambitious diversion goals. In addition, the Louisville Metro Code of Ordinances (LMCO) includes several provisions that affect the management of solid waste in Jefferson County. A brief overview of current plans and policies is provided in the following sections.

### Solid Waste, Recycling, and Sustainability Plans

Louisville Metro has adopted several plans, charters, and other documents related to solid waste management, recycling, and sustainability.

## Sustain Louisville

Sustain Louisville was published in 2013 and is Louisville’s first sustainability plan. This plan highlighted recent achievements and outlined goals and target dates across six sectors: energy, environment, transportation, economy, community, and engagement. The Sustain Louisville Plan established three goals related to solid waste:<sup>1</sup>

- Increase recycling citywide by 25 percent by 2015.
- Achieve 90 percent residential recycling participation by 2025.
- Divert 50 percent of solid waste away from the landfill by 2025 and 90 percent by 2042.

The Sustain Louisville Plan also included a number of priority initiatives to support achieving the 90 percent diversion target:

- Launch a recycling pilot to expand recycling for commercial buildings, restaurants, retail stores, and multi-tenant apartments.
- Launch a food waste compost pilot project in school cafeterias.
- Establish partnerships to champion education and awareness campaigns on waste reduction practices.
- Launch a plastic bag ban for residential yard waste.
- Launch a residential food waste compost pilot program.
- Promote recycling and food waste composting at all city-sponsored events.
- Offer composting, yard waste reduction, and recycling workshops.
- Expand participation in food waste composting to institutional cafeterias citywide.
- Investigate alternatives to landfill waste disposal practices.

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<sup>1</sup> Louisville Metro Government, “Sustain Louisville: Louisville Metro Sustainability Plan,” March 2013, [https://louisvilleky.gov/sites/default/files/sustainability/pdf\\_files/sustainlouisville.pdf](https://louisvilleky.gov/sites/default/files/sustainability/pdf_files/sustainlouisville.pdf) (accessed April 2016).

## Mayor's Six-Year Strategic Plan

In addition, the Mayor's Six-Year Strategic Plan includes five key priorities to achieve 90 percent diversion by 2042:<sup>2</sup>

1. **Research and Development:** Conduct a 10-Year Solid Waste Management Plan.
2. **Increase Recycling:** Increase recycling of solid waste by five percent every five years.
3. **Reduce Solid Waste:** Reduce the amount of solid waste produced within Louisville Metro by one percent every five years.
4. **Increase Reuse of Goods:** Increase reuse of durable and non-durable goods by one percent every five years.
5. **Increase Alternative Use of Materials:** Increase alternative use of solid waste materials destined for the landfill by one percent every five years.

## Recycling Charter

In 2012, Louisville Metro collaborated with stakeholders from cities with high recycling rates and local stakeholders to develop a "Recycling Charter." This charter set short and long-term goals to increase the recycling by 25 percent by 2015 and to achieve a 90 percent diversion rate by 2042. Specific objectives of the charter included:

- Increasing the number of households, businesses, and individuals who reduce, reuse, and recycle.
- Increasing the expected useful life of the landfills.
- Building Louisville's reputation for thinking and acting "green."

The charter also included an implementation timeline and milestones to support the short-term recycling goals.

## Louisville/Jefferson County Metro Government Solid Waste Management Plan 2013–2017

The Louisville/Jefferson County Metro Government Solid Waste Management Plan (SWMP) is a five-year plan required by the Commonwealth of Kentucky. It covers collection, disposal, recycling and waste reduction, dumping and litter, facility siting, regulatory enforcement, public participation, and financing mechanisms.

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<sup>2</sup> Louisville-Jefferson County, "Goal 18: Increase Diversion: Reduce, Reuse, Recycle," <https://louisvilleky.gov/government/mayor-greg-fischer/strategic-plan/goal-18-increase-diversion-reduce-reuse-recycle> (accessed April 2016).

# 1. EXISTING CONDITIONS

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The SWMP also describes the County's recycling goal and calculation methodology. The SWMP sets a goal of recycling 25 percent of the municipal solid waste stream, which excludes yard waste, contaminated soils, and construction and demolition debris. Louisville Metro also calculates a separate diversion rate (which includes contaminated soils) and a Recycling Charter rate (which also includes yard waste and construction and demolition debris).

## Louisville Metro Code of Ordinances

Louisville Metro Code of Ordinances (LMCO) Chapter 51 includes two key provisions that support recycling and composting and one provision that could potentially restrict options for promoting diversion in Jefferson County. These three provisions are described below.

### Ban on Landfill Disposal of Yard and Bulky Wood Waste

According to LMCO 51.509, no yard waste or bulky wood waste may be disposed of at a landfill or solid waste management facility in the County. Yard waste and bulk woody waste must be deposited at a permitted facility for recycling, composting, or other beneficial reuse.

To reduce contamination in composting, at the start of 2015, Louisville Metro also implemented a ban on using plastic bags in yard waste collection (LMCO 51.507). Yard waste set out for collection must be in a reusable bin, paper yard-waste bag, or compostable plastic bag that meets ASTM D6400 standards.

LMCO 51.999 describes penalties for violations of the landfill disposal ban or ban on plastic bag use for yard waste collection. Those who violate the bans may be subject to a civil penalty of \$50 per day or per occurrence. However, the amount of yard waste remaining in disposed waste indicates that enforcement of these provision could be improved (see Section 1.3.2 Current Disposal on page 12).

### Required Offer of Composting and Recycling to Collection Customers

According to LMCO 51.300, licensed waste haulers operating within the county must offer a basic service package to all residential customers consisting of once-a-week curbside collection of household waste, once-a-week seasonal collection of yard waste, and once-a-week curbside collection of recyclables. Recyclables collection must include newspaper; aluminum and steel cans; clear, green and brown container glass; HDPE and PETE plastic bottles and jugs. Other alternative collection service scenarios may be used if approved by the Waste Management District Board. All private haulers must also offer collection of source-separated recyclables to all commercial and industrial customers.

While the provision ensures residents and businesses have access to recycling and composting collection, it does not require the service to be affordable or convenient. The ordinance also does not require residents or businesses to subscribe to the service.

## Mandatory Weekly Garbage Collection

The LMCO also includes one provision that reduces dumping but could inhibit waste diversion by preventing every-other-week collection of garbage. According to LMCO 51.500, owners of every residence and owners and occupants of every commercial or industrial establishment must provide for disposal of solid waste at least weekly. This regulation prevents haulers from offering every-other-week garbage collection, which has been shown to increase diversion when combined with curbside recycling and composting. Every-other-week and monthly garbage collection options can also reward customers who generate minimal amounts of garbage with a lower-cost collection option.

### 1.1.2 Education & Outreach

In addition to collection programs, Louisville Metro also offers several education and outreach programs to promote waste reduction, recycling, and minimization of yard waste to residents and businesses.

Residential education efforts include the “[Love ‘Em and Leave ‘Em Louisville](#)” (LELE) campaign, which encourages residents to use leaf and grass mulch onsite; K-12 sustainability education through developing and marketing lesson plans for teachers; a [multifamily recycling toolkit](#) to help property managers start and improve recycling programs; and curbside waste reduction and recycling education. Curbside education programs include messages focused on the correct way to recycle delivered through social media (Twitter, Next Door, and Facebook). Colors used to signify recycling, trash, and organics are standardized within the Urban Services District and can enhance resident understanding of the collection system; however, private companies that serve other areas of the county may use different color schemes.

Louisville Metro also had two residential recycling incentive programs during the Study period. The “[Recycle and Win](#)” program rewards individual households that recycle correctly with grocery gift cards. The “[Green Living Neighborhood](#)” certification program provides education and recognizes waste reduction, recycling, and other sustainability efforts across an entire neighborhood.

Education for the institutional, commercial, and industrial (ICI) sector includes technical assistance to develop waste management plans and connect with other resources, a “[business launch pack](#)” toolkit to help offices implement recycling programs, and a [best practices guide](#) for recycling at public events. In the Central Business District wet/dry pilot program, SWMSD uses “oops” tags on waste carts to notify and educate customers about sorting materials correctly. Restaurants participating in the wet/dry program that meet additional requirements can become a [Green Fork](#) restaurant and receive recognition through a plaque, window stickers, and a listing on Louisville’s website.

### 1.2 Existing Collection and Processing System

This section summarizes existing collection and processing systems in Jefferson County. It includes an overview of:

- Collection
- Drop-off Program
- Regional Recycling Facilities and Markets

Volume 2 of this Study (*Collection System Assessment*) contains a more extensive assessment of collection and processing systems in Jefferson County.

#### 1.2.1 Collection Programs

The availability and level of collection services for residential households in Jefferson County depends on where the household is located. This section summarizes the collection programs within the following three subsets of the County:

- The Urban Services District
- Incorporated Cities
- Unincorporated areas of Jefferson County.

Additional information about collection services can be found in Appendix A1.

#### Urban Services District (USD)

The City of Louisville's Urban Services District contains nearly 107,000 households, or approximately 40 percent of all households in Jefferson County. More than 84,000 of these households consists of single-family residences or small multifamily properties with no more than eight units. Eligible customer types for collection services from Solid Waste Management Services Division (SWMSD) include these single-family residences and small multifamily properties as well as businesses that generate no more than six 95-gallon carts of garbage per week. Multifamily and business properties that generate more garbage or require dumpster service can subscribe to garbage, recycling, and yard waste collection service through private haulers.

All residents served by SWMSD receive recycling, yard waste, and bulky waste collection along with garbage service. These services are funded through property taxes. Garbage is collected weekly in 65- or 95-gallon carts. The baseline single-stream recycling service is collected weekly in 18-gallon bins, although residents may opt to purchase a 95-gallon carts for \$50. Yard waste is collected weekly, with customers supplying their own containers or paper bags. Bulky waste is collected three times per year. The full cost of service for these residents is \$14.60 per month for curbside service and \$18.50 for alley

# 1. EXISTING CONDITIONS

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service. These full costs exclude other SWMSD costs for facility management, common good services (such as litter clean-up and street sweeping), and management and administration.

SWMSD currently has a limited wet/dry program to collect waste from commercial customers in the Central Business District using two containers: one for food and compostable paper (wet) and a second for all other materials (dry). Generators of larger quantities of food waste, such as restaurants and coffee shops, are given 32- to 64-gallon carts for wet waste collection. Wet material is sent to a composting facility and dry material is sent to a material recovery facility to separate out recyclable materials. Waste characterization from this pilot show that that more than two-thirds (70%) of dry material collected is currently recyclable in Louisville. Contamination was relatively low across both dry and wet bins; no more than four percent of the material collected was placed in the wrong bin.

## Incorporated Cities

Another 82 incorporated cities (excluding the City of Louisville) contain approximately 18 percent of residential households in Jefferson County. Some incorporated cities contract with various private hauling companies to provide exclusive residential garbage (including bulky waste), recycling, and yard waste collection. Other cities allow open market subscription similar to unincorporated areas.

Services available through city contracts vary considerably in collection frequency, streams collected, and rates. In some incorporated cities, residents who want recycling and yard waste collection must pay additional charges, leading some residents not to subscribe. Overall, 75 percent of residents in incorporated cities either receive or have the option to subscribe to weekly or every-other-week recycling; 65 percent receive or have the option to subscribe to yard waste collection, and 30 percent receive or have the option to subscribe to bulky waste collection.

Based on a review of city contracts, residential collection fees vary significantly in incorporated cities:

- Bundled rate contracts (in which all customers receive weekly garbage, recycling, and yard waste) range from \$12 to \$15 per month.
- Weekly garbage collection ranges from \$6 to \$15 per month.
- Weekly recycling ranges from \$1.50 to \$7 per month.
- Every-other-week recycling ranges from \$1 to \$3 per month.
- Weekly yard waste ranges from \$3 to \$4 per month; some cities bundle weekly yard waste collection with garbage rather than charging a separate fee.

None of the city garbage collection contracts contain language targeting or incentivizing high waste diversion, such as charging more for larger amounts of garbage disposed (“pay-as-you-throw”). City garbage collection contracts rarely addressed commercial container collection (e.g., dumpster service), leaving commercial customers to subscribe to collection service on the open market.

## Unincorporated Areas

Unincorporated areas contain the remaining 42 percent of residential households in Jefferson County. Data on collection services for unincorporated areas are limited and are based on the results of a statistically representative household survey. Overall, an estimated 23 percent of residents in unincorporated areas have curbside recycling collection, 37 percent have yard waste collection, and 64 percent have bulky waste collection (often on a limited basis, but included as part of their garbage collection).

The unincorporated areas present a classic example of an open market for solid waste collection. Customers have complete freedom to choose any service provider they prefer and choose and pay for any service they want (or, conversely, to decline to pay for and receive a service). They can also change service providers at will.

At the same time, the current open market system presents implicit challenges. Compared to residents in the Urban Services District and in incorporated cities, residents in unincorporated areas tend to have the lowest level of curbside collection service and the highest cost for whatever level of service they opt to pay for. MSW Consultants conducted a random-sample, mail-based survey to obtain cost data, which found that the reported monthly costs for garbage, recycling, and yard waste collection in unincorporated areas are highly variable but are generally higher than in other parts of Jefferson County.

- For those who pay for this service directly, the average monthly amount paid by all respondents is estimated to be \$18, which in some cases includes yard waste collection but excludes recycling collection. Approximately 10 percent of respondents reported that their garbage service is provided by their homeowners' association.
- For respondents who did pay for recycling, the average fee was \$5 per month for every-other-week collection. Just under half (44%) of respondents reported "free" recycling, with the cost of service either included with garbage collection or incorporated into homeowners' association fees or taxes.
- For respondents who paid for yard waste collection, the average fee was over \$9 per month. Over one-third (34%) of respondents reported "free" yard waste collection, with the cost of service either included with garbage collection or incorporated into homeowners' association fees or taxes.

Unincorporated residents who responded to the public survey mentioned their dissatisfaction with lower service levels at a higher cost in open-ended responses. As a result of lower service levels and higher costs for recycling and composting collection, diversion rates are consequently lower in the unincorporated area compared to the Urban Services District and incorporated cities. Volume 2 of this report (*Collection System Assessment*), provides more details and recommendations regarding collection system efficiency.

### 1.2.2 Drop-off Programs

Several drop-off centers and special collection programs are available in the County. Additional information about each of these is available in Appendix A1.

The following drop-off centers are available in Jefferson County:

- 14 unstaffed County-operated recycling drop-off centers that accept source-separated traditional recyclables.
- Four staffed county-operated recycling drop-off centers. These locations, in addition to source separated recyclables, also accept other recyclable household hazardous wastes such as cooking oil, batteries, computers, and cell-phones.
- The County Waste Reduction Center.
- Private facilities, such as Republic Services' Poplar Level Transfer Station, Waste Management's Outer Loop Recycling and Disposal Facility, and QRS Recycling.

Residents and businesses in Jefferson County also have access to special collection events. The Department of Public Works operates several special collection programs and events that promote recycling and composting materials beyond regular curbside and drop-off collection programs. Many of these programs collect otherwise hard-to-recycle materials. These events include:

- Free Shredding for documents, discs, hard drives, credit cards, and other materials.
- Drug Toss, held in conjunction with the free shredding event for safe disposal of unwanted medications and pharmaceuticals.
- Free Junk and Bulk Waste Drop-off events.
- Fall Leaf Drop and Tree-Cycling event for fall leaves and Christmas trees.

The Department of Public Works also provides free recycling containers in an equal ratio to purchased garbage containers for public events with over 500 attendees to promote event recycling. Food scrap containers are available for a nominal fee.

### 1.2.3 Regional Recycling Facilities and Markets

Several recycling facilities in Jefferson County collect curbside recyclable materials as well as commercial recyclables (e.g., scrap metal). Most of these facilities allow public drop-off of materials. Several construction and demolition debris recyclers operate in Jefferson County as well, collecting and processing asphalt shingles, brick, concrete, and clean fill materials. Other recyclers in Jefferson County focus on more specialized materials, such as electronics, appliances, or wood pallets.

In general, recycling commodity prices and market demand are low, and forecasts indicate that prices will remain low in coming years. Southeast region average recyclable commodity prices as of August 2016 are available in Appendix A1.

### 1.3 Diversion Performance and Disposed Waste

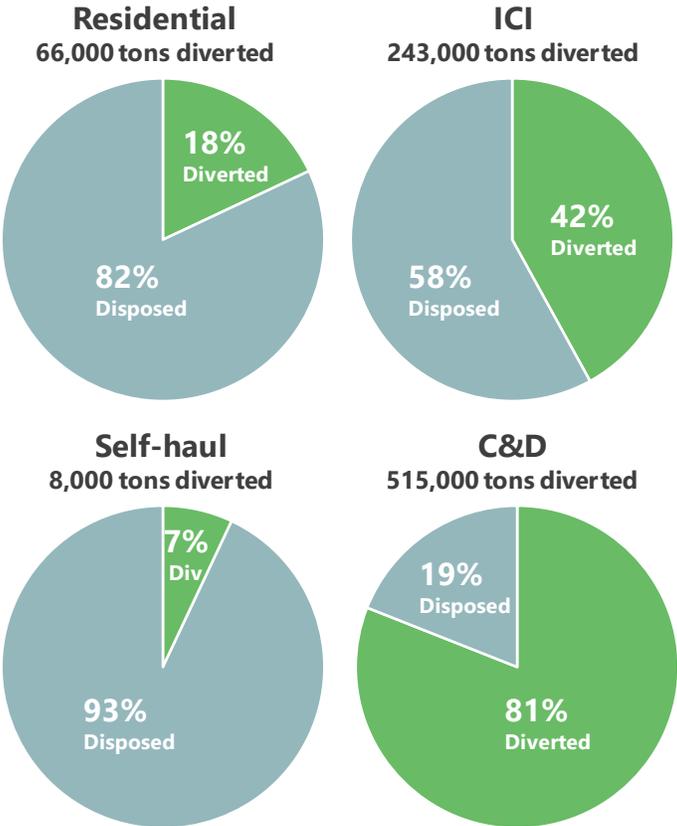
Effective diversion relies on a thorough understanding of existing diversion and disposal streams. As part of the solid waste study process, Louisville Metro commissioned a waste characterization study of disposed residential waste; disposed industrial, commercial, and institutional (ICI) waste; disposed construction and demolition (C&D) debris; disposed bulky, and self-haul (SH) wastes; and recycled curbside residential materials. Volume 1 of this Study contains complete waste characterization study results. Louisville Metro also obtained data on commercial recycling, composting, and C&D debris diversion through reports from haulers and facilities.

#### 1.3.1 Current Diversion

Based on figures reported by Louisville Metro's Solid Waste Management District, the residential, ICI, self-haul, and C&D debris sectors in Jefferson County diverted nearly 834,000 tons in 2015, resulting in a diversion rate of nearly 49 percent. This diversion rate excludes industrial metal recycling and treated sewer sludge. Diversion rates and tonnages varied significantly by sector (Figure 1):

- 18 percent for the residential sector (66,000 tons).
- 42 percent for the ICI sector (243,000 tons).
- 7 percent for the self-haul sector (8,000 tons).
- 81 percent for the C&D sector (515,000 tons).

Figure 1. Current Diversion Rates by Sector (2015)



Overall, 83 percent of waste generated (both recovered and disposed) in Jefferson County consisted of material that is recoverable or could readily become recoverable (such as food waste and compostable paper). In 2015, Jefferson County captured 58 percent of all recoverable materials. Overall, 834,000 tons of recoverable materials were diverted in Jefferson County, while another 592,000 tons of recoverable materials were sent to landfills.

### 1.3.2 Current Disposal

Facilities in Jefferson County reported disposing a total of nearly 880,000 tons of waste in landfills in 2015. The allocation of disposed tonnage to generating sectors appears in Table 1 below. As shown, the ICI sector was the largest generator of waste, disposing of 38 percent of Jefferson County’s waste, followed by the residential sector (35% of waste). Construction and demolition (C&D) and self-haul waste combined represented nearly 27 percent of disposed waste in 2015.

Table 1: Countywide Disposed Tons by Sector (2015)

Sector	Tons	Percent
<b>Residential total</b>	<b>308,944</b>	<b>35%</b>
<i>Single-family (8 units or fewer per building)</i>	240,799	27%
<i>Multifamily (more than 8 units per building)</i>	48,748	6%
<i>USD bulky</i>	19,397	2%
<b>Industrial, Commercial, and Institutional (ICI)</b>	<b>335,514</b>	<b>38%</b>
<b>Self-haul total</b>	<b>110,150</b>	<b>13%</b>
<i>Residential self-haul</i>	35,034	4%
<i>Commercial self-haul</i>	75,116	9%
<b>Construction &amp; Demolition C&amp;D)</b>	<b>124,017</b>	<b>14%</b>
<b>Total</b>	<b>878,625</b>	<b>100%</b>

In the next sections, characterization data for waste disposed in landfills are presented in bar charts by recoverability category:

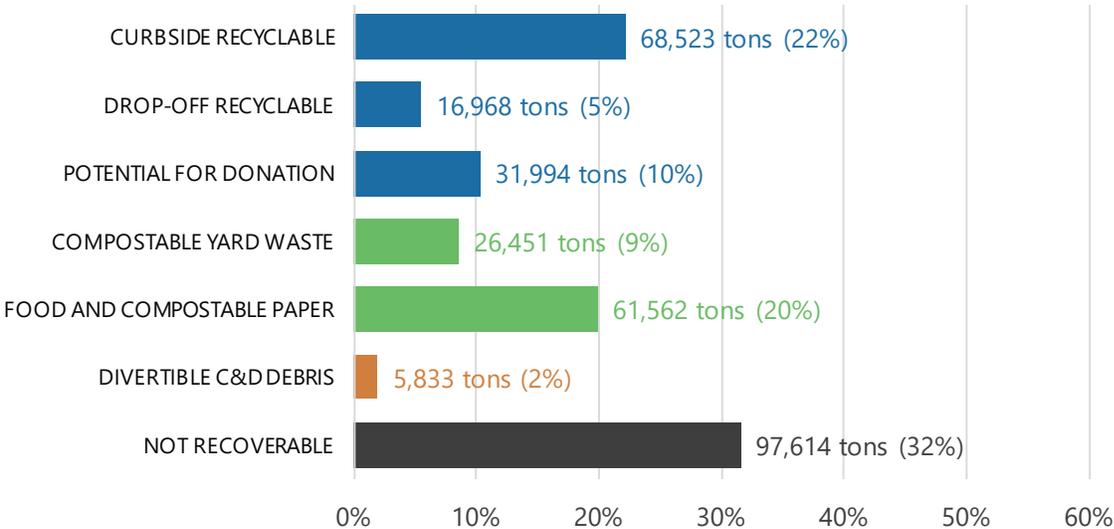
- **Curbside recyclable** includes recyclable paper and metal, plastic, glass, and aseptic containers targeted in the USD curbside recycling program.
- **Drop-off recycling available** includes materials for which regular drop-off recycling programs exist in Jefferson County, such as clean plastic film, non-container metals, rigid plastics, electronics, appliances, and tires.
- **Potential for donation** includes clothing, other textiles, furniture, and bulky items.
- **Compostable yard waste** includes grass clippings, branches, and other yard waste.
- **Compostable food and paper** includes food scraps and compostable paper
- **Recyclable C&D debris** includes materials such as untreated wood, brick, concrete, other aggregates, and asphalt roofing.
- **Non-recoverable** includes all other materials.

## Residential Waste

More than one-third (36%) of waste disposed of by Jefferson County residents in 2015 was currently recoverable through existing curbside recycling, drop-off recycling, or yard waste composting programs (Figure 2). Another 20 percent could potentially have been recovered through food scrap composting, and 10 percent had the potential for donation. Overall, more than two-thirds (68%) of residential waste in Jefferson County could have been diverted from landfill disposal in 2015.

Residential waste includes regular curbside garbage disposed of by single-family and multifamily residents as well as waste that single-family residents in the USD dispose of through curbside bulky collection.

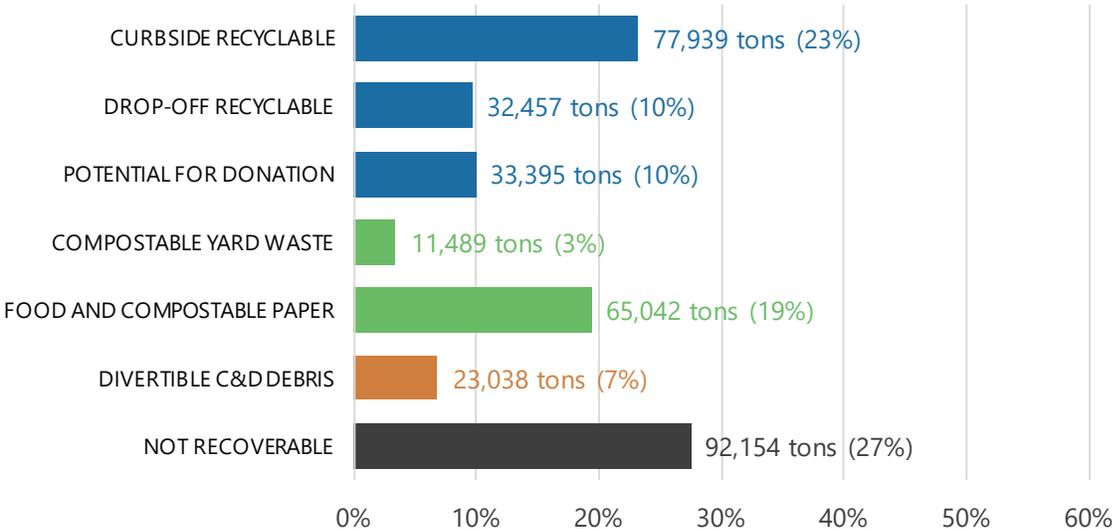
Figure 2: Recoverability of Disposed Residential Waste (2015)



## Industrial, Commercial, and Institutional (ICI) Waste

More than one-third (36%) of waste disposed of by Jefferson businesses in 2015 was currently recoverable through existing recycling or yard waste composting programs (Figure 3). Another 19 percent could potentially have been recovered through food scrap composting and 10 percent had the potential for donation. Overall, nearly three-quarters (73%) of ICI waste in Jefferson County could have been diverted from landfill disposal in 2015.

Figure 3: Recoverability of Disposed ICI Waste (2015)

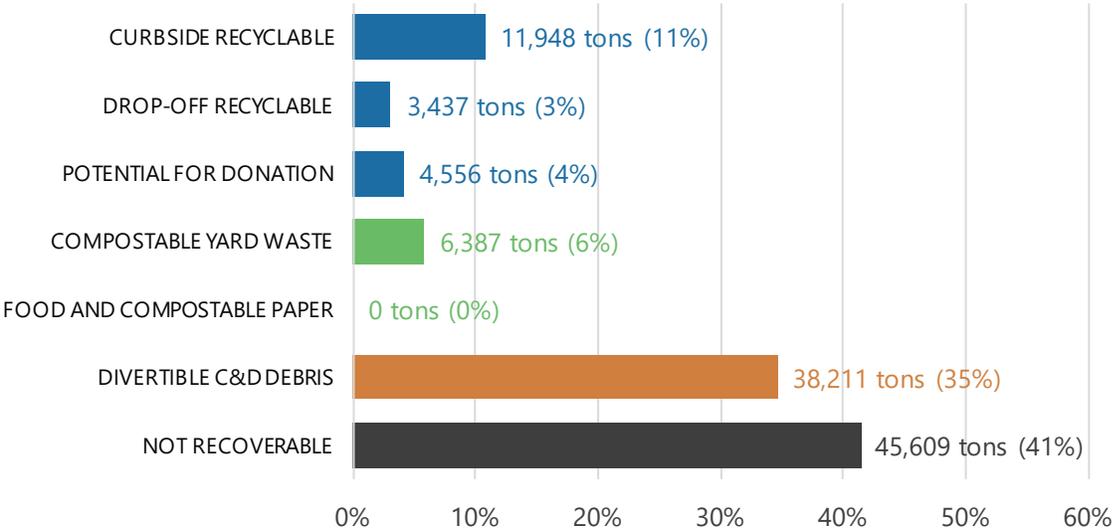


## Self-haul Waste

Approximately 20 percent of self-haul waste, which is waste transported by the generator of the waste without the use of a licensed waste hauler, in 2015 was currently recoverable through existing recycling and yard waste composting programs (Figure 4). More than one-third (35%) of self-haul waste consisted of divertible C&D debris, such as clean wood, asphalt roofing, and aggregates. Another 4 percent of self-haul waste had the potential for donation. Overall, nearly three-fifths (59%) of self-haul waste in Jefferson County could have been diverted from landfill disposal in 2015.

This waste includes self-haul material from both the residential and ICI sectors.

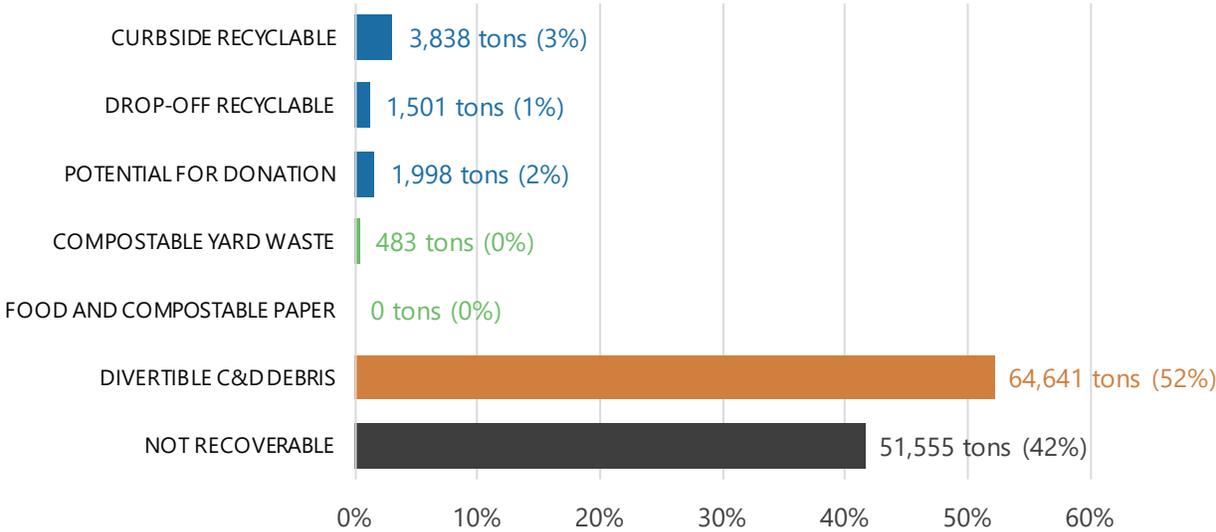
Figure 4: Recoverability of Disposed Self-haul Waste (2015)



## Construction and Demolition (C&D)

More than one-half (52%) of C&D waste consisted of divertible C&D debris, such as clean wood, asphalt roofing, and aggregates (Figure 5). Construction and demolition debris contained comparatively little waste that could have been recovered through existing recycling and yard waste composting programs (5%) or that had the potential for donation (2%). Overall, nearly three-fifths (58%) of C&D waste in Jefferson County could have been diverted from landfill disposal in 2015. This waste includes materials delivered to disposal sites from construction and demolition projects.

Figure 5: Recoverability of Disposed C&D Waste (2015)



## 2. ASSESSMENT OF EXISTING PROGRAMS

To inform development of the *Solid Waste Study for Louisville/Jefferson County*, Cascadia researched industry best practices for waste reduction and recycling programs, including those enacted in high-diversion benchmark cities. Best management practices identified through this research were used to assess existing programs in Jefferson County, with a focus on identifying programs, processes, and policies that are underutilized or currently not in use and that could be implemented or improved. Efforts in Jefferson County may be conducted by Louisville Metro Government (Louisville Metro) through the Department of Public Works (DPW) Solid Waste Management Services Division (SWMSD), incorporated cities, the Waste Management District (WMD), public-private partnerships, or private and non-profit entities including haulers and recyclers.

Members of the consultant team (Cascadia and MSW Consultants) conducted research on industry best practices for waste reduction and recycling programs throughout the United States. Cascadia also researched and interviewed staff from peer and high-diversion cities in the Southeast and Midwest to learn what policies were being implemented in the region. Benchmark jurisdictions included:

- Charlotte-Mecklenburg County, North Carolina (*abbreviated as C-M Co. in the tables*)
- Ann Arbor, Michigan<sup>3</sup>
- Austin, Texas
- Gainesville, Florida
- Madison, Wisconsin

Relative to other high-diversion peer jurisdictions, Jefferson County has a comprehensive and varied set of waste reduction and recycling and education programs in place. However, Jefferson County also has opportunities to improve its collection and processing capabilities, incentives and rate structures, and regulations and enforcement that support waste diversion. Based on the review of best practices and current implementation, Cascadia developed an initial list of potential strategies for Louisville Metro and stakeholders to consider. This initial list was informed by consideration of the following topics:

- Materials that are currently disposed in large quantities
- Materials for which there are viable local and regional markets
- The generators of those materials
- The current recycling infrastructure
- Current collection systems across the region's urban, suburban, and rural areas

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<sup>3</sup> Information about Ann Arbor's program was obtained from the city's website and published documents; it has not been confirmed by program staff.

Appendix A2 provides more detail on the benchmarking research and assessment of current implementation in Louisville Metro.

### 2.1 Summary Assessment for Louisville Metro

In Jefferson County, all residents and businesses have access to curbside recycling and composting service if they choose to subscribe. The County provides education and outreach, drop-off collection, and special collection, and other programs to increase diversion at homes, businesses, special events, and construction sites. In 2015, Jefferson County achieved a diversion rate of 49 percent. This section summarizes the strengths and limitations of current program implementation.

#### 2.1.1 Successes of the Current System

Strengths of Louisville's current system include:

- **Varied educational and outreach programs** that span sectors and types of disposed material. These include the residential campaigns to promote leaf mulching and grasscycling, a “launch pack” for office recycling programs, and promotion of green building practices to the C&D sector.
- **Wide availability of collection services**, particularly in the Urban Services District (USD). All residents and businesses have access to curbside recycling and yard waste collection service if they choose to subscribe.
  - Single-stream recycling is available throughout the jurisdiction.
  - The curbside single-stream recycling program accepts an expanded list of materials, such as #1-7 plastics.
  - The DPW offers opportunities for curbside pick-up of bulky goods in the USD several times a year.
- **Drop-off programs** offered by the Department of Public Works and/or Solid Waste Management Services Division that cover a broad range of materials. These materials include e-waste, de-flocked Christmas trees, and expired or unused pharmaceuticals.
- **Standardization of waste reduction and recycling colors and messages.** Louisville Metro has identified the need for standardization, which can reinforce the messaging used, help residents develop color and image associates with desired diversion behavior, and cross language and educational barriers in communication.
- **Use of partnerships.** Waste reduction and recycling efforts are not conducted solely by the Solid waste management industry; a number of the practices used by Louisville Metro are done in partnership other groups, such as the Office of Sustainability, universities, and local philanthropic groups.

### 2.1.2 Limitations of the Current System

Louisville has several positive program elements in place; however, its programs also have limitations and challenges, including the following.

- **Deployment is limited.** Many programs exist only as a pilot or at limited scale, and some education materials are not widely distributed or promoted. For example:
  - Targeted educational guides for property managers on recycling program implementation exist but have not been widely distributed or promoted.
  - Technical assistance to businesses on recycling is limited and informal.
  - Food waste and compostable paper collection is available only to ICI generators in the central business district.
- **Collection offerings are not universally provided.** Specifically, recycling and organics service is not universally provided (though it is available). Additionally, wet/dry collection is provided only in the central business district.
- **Some programs are not currently offered.** Louisville has not currently developed or deployed some best management practices for increasing diversion or decreasing waste generation. For example:
  - Technical assistance for property managers is not currently provided.
  - Material exchanges are not currently available, and reuse organizations are not currently leveraged to increase waste diversion and waste reduction.
  - Louisville Metro has not yet engaged in national or regional product stewardship efforts.
  - A bin/cart standardization effort, such as the Louisville Metro new “Stop, Think, Reduce, Reuse, Recycle” campaign is underway, but the effort has not yet been extended to the entire solid waste industry in Louisville Metro.
  - Louisville Metro has not yet published comprehensive guides tailored to the location that describe how to dispose or divert particular materials or describe available collection options.
- **Program participation is mostly voluntary, and there is limited enforcement of regulations that do exist.** While special drop-off and collection programs exist for a wide range of materials, participation rates for these programs are unknown. Also, though the Louisville Metro Code of Ordinances requires composting and recycling to be offered to commercial customers, there is no enforcement mechanism in the ordinance. Additionally, no materials are currently required to be recycled or composted, though there is a disposal ban on yard waste.
- **Incentives to reduce waste and recycle are limited.** Enforcement of regulations is primarily limited to customer complaints. For the most part, compliance with waste reduction and recycling regulations is voluntary at this time. Moreover, customers—who, in general, can be strongly motivated by financial mechanisms—are not incentivized to divert waste because no pay-as-you-throw programs are implemented in the county, recycling and organics collection service costs are not embedded into the cost of garbage collection, and regional landfill tip fees are low.

## 2. ASSESSMENT OF EXISTING PROGRAMS

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- **Messaging is inconsistent throughout Jefferson County.** For example, although the USD is standardizing bin colors and colors used in messaging associated with recycling, trash, organics, and reuse, private haulers who serve other parts of the county use their own (and different) color schemes. Also, Louisville Metro’s choice to use orange to represent recycling is less consistent with what is often used in larger, nationwide campaigns, where recycling is often associated with the color blue.
- **Several materials present in large quantities in the waste stream are not currently addressed by any programs** or are addressed only by programs with limited scope. These include:
  - Textiles – 4.7% of the overall disposed waste stream, or 41,200 tons.
  - Food waste – 10.0% of the overall disposed waste stream, or 88,200 tons.
  - Recyclable wood – more than 25% of the combined C&D and self-haul waste streams and 9.5% of the overall disposed waste stream, or 83,300 tons.

### 2.1.3 Key Opportunities

Key opportunities to improve the current system include:

- **Increase efficiency and reduce the cost of collection services** in unincorporated Jefferson County by transitioning over time to a system of multi-district, exclusive collection zones that maintain opportunities for private haulers while achieving lower costs for residential customers.
  - Increased collection efficiency does not directly increase diversion; however, cost savings from more efficient garbage collection can be used to expand recycling and composting services without increasing the overall cost of collection to customers (see Chapter 4.7.2 *Long-term Strategies (More Efficient Collection System)* on page 49 for more discussion).
- **Expanding the reach of programs** by scaling up implementation of pilot programs to full deployment and increasing the distribution of educational materials.
- **Ensuring that all residents receive basic recycling collection services** throughout the county.
- **Developing additional incentives** (financial or regulatory) for participation in waste reduction and recycling programs.

## 2. ASSESSMENT OF EXISTING PROGRAMS

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- **Addressing materials that are present in the waste stream in large quantities**, such as textiles, food waste, and untreated wood. This may include:
  - Developing processing and collection infrastructure for food waste and compostable paper.
  - Providing processing infrastructure and collection capacity for C&D materials.

Table 2 below lists each of the best management practices (BMP's) not currently used by Louisville Metro and indicates what high-performing peer cities are doing in comparison. Highlighted rows show where the majority of the high-diversion communities have implemented best management practices that are not currently implemented in Louisville. Best practices were sorted into five broad categories:

- Waste Reduction and Reuse
- Collection and Processing
- Education and Outreach
- Incentives and Rates
- Regulations and Enforcement

## 2. ASSESSMENT OF EXISTING PROGRAMS

Table 2. Best Practices in High Diversion Cities Not Currently Implemented in Louisville

BMP	C-M Co.	Ann Arbor	Austin	Gainesville	Madison
<b>Waste Reduction &amp; Recycling</b>					
Create and/or promote online forums for material exchange.	✓		✓	✓	✓
<b>Collection &amp; Processing</b>					
Provide universal access to organics collection that includes food waste and compostable paper.					
Establish exclusive collection for all residential customers to achieve lowest unit cost	✓	✓	✓	✓	✓
Expand and improve public space recycling.	✓	✓	✓	✓	
Standardize regional signage systems at waste facilities.			✓		
Conduct floor sorts at transfer and disposal sites.	✓		✓		
Provide mixed waste processing capability.					
Provide mixed C&D processing capability.	✓		✓		✓
Promote national and regional product stewardship.	✓	✓	✓	✓	✓
<b>Education &amp; Outreach</b>					
Recruit resident champions to promote recycling and composting in their communities.	✓		✓		
Provide technical assistance to multifamily properties.		✓	✓	✓	
<b>Incentives &amp; Rates</b>					
Implement pay-as-you-throw fees.			✓	✓	
Embed the cost of recycling and organics service into garbage collection.		✓ <sup>4</sup>	✓	✓	✓ <sup>5</sup>
Set transfer station and drop-off fees to incentivize diversion.	✓		✓		
<b>Regulations &amp; Enforcement</b>					
Implement mandatory recycling for target materials.	✓		✓	✓	✓
Require separation of recyclables at self-haul facilities.		✓			✓
Implement C&D ordinances to increase C&D recycling.			✓	✓	✓
Require ICI and multifamily sites to have sufficient waste diversion capacity and infrastructure.			✓		
Require recycling and composting at large public events.			✓		✓

<sup>4</sup> Currently, rates are only embedded for recycling.

<sup>5</sup> Currently, rates are only embedded for recycling.

### 2.2 Collection System Benchmarking

Volume 2 of this Study includes a benchmarking study comparing the performance and characteristics of Louisville Metro’s collection system to five peer communities and five high-diversion communities.<sup>6</sup> MSW Consultants made several observations based on this benchmarking study and its awareness of municipal solid waste collection practices in Kentucky and nationally. Key findings from the collection system benchmarking study are summarized below.

- **Solid waste management in Jefferson County is dramatically more complicated than in the comparison communities** because it is composed of three distinct collection arrangements (Urban Services District, 82 other incorporated cities, and unincorporated areas).
- **All of the high-diversion communities have publicly committed to long- or short-term goals** to increase diversion or reduce landfill disposal through published plans and are taking steps to reach their goals. Conversely, peer communities are more likely to provide solid waste collection as one of many “background” public services and have not set explicit long-term goals associated with increased diversion and/or sustainability.
- **Local governments in both peer and high-diversion communities are responsible for overseeing single family residential service provided by a single (exclusive) hauler.** Garbage is collected weekly and recycling is collected weekly or every other week. High-diversion communities typically offer recycling collection every-other-week using recycling carts: the large cart size provides ample storage capacity for clean recyclables to offset less frequent collection.
- Although benchmarking research found only small-scale or pilot testing of expanded organics collection, several **high-diversion communities have begun to recognize that adding food and compostable paper to existing yard waste collection is the next logical step** to significantly increase diversion. Ann Arbor, Michigan, accepts food scraps and bamboo dinnerware in residential compost carts. Austin, Texas, and Madison, Wisconsin, both have pilot programs that accept food scraps and food-soiled paper in compost carts. SWMSD’s successful wet/dry collection from the Central Business District shows that some infrastructure exists for composting yard waste mixed with food waste.
- Benchmarking research confirmed that **residential bulky waste collection is one of the most highly variable services within municipal waste management programs.** At its core, bulky waste collection should be provided for free to remove a few residential bulk items annually with the ability to charge customers who set out excessive quantities or use the service more frequently.

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<sup>6</sup> Peer communities are local governments in Kentucky and nearby states where regulatory and market dynamics are more likely to be similar, populations are comparable, and the governments provide roughly comparable services to Jefferson County. High -diversion communities are local governments considered to be best-in-class providers of various waste and recycling services that have progressed aggressively towards their own zero waste goals.

## 2. ASSESSMENT OF EXISTING PROGRAMS

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- Although not universal, **many high-diversion cities nationally regulate commercial-sector solid waste collection to a high degree**—more than both the peer communities and Louisville Metro. Regulatory mechanisms include municipal collection, franchise agreements, and contracts. Two high-diversion benchmark cities use franchise collection systems to regulate solid waste collection from small businesses and for commercial container (e.g., dumpsters) service for large commercial establishments.
- **High-diversion cities are more likely to manage their system with financial transparency through direct charges to the customer and through enterprise funding of the solid waste system.** Cities funded by user fees often bundle the cost of all residential curbside services (garbage, recycling, yard waste, and a base level of bulky waste service) into solid waste collection rates. Two of the high-diversion benchmark cities offer volume-based garbage rates that provide an incentive for customers to recycle and compost.
- **Highly successful solid waste programs have an increased level of government oversight of collection systems** to design and pay for a program that maximizes diversion. Open systems served by multiple, overlapping haulers tend to cost customers more due to the inherent inefficiency of redundant service that does not optimize solid waste system performance.

### 3. STRATEGY ASSESSMENT, STAKEHOLDER PROCESS, AND SCENARIO DEVELOPMENT

Cascadia identified potential strategies informed by the research on industry best practices for waste reduction and recycling programs and assessment of existing programs in Jefferson County. Cascadia worked with stakeholders to develop short-term and long-term scenarios and evaluate potential waste diversion from the short-term scenario strategies in three phases:

1. **Strategy identification and initial screening** (Task 3.2) – Cascadia used qualitative criteria regarding diversion, costs, and feasibility/risk to develop a short list of strategies to propose to stakeholders. The screening focused on identifying strategies with the highest potential for success based on available tons and program effectiveness. Details on the initial screening criteria and results are presented in Appendix C1.
2. **Stakeholder engagement** (Task 7) – Cascadia and the consultant team conducted four stakeholder workshops to obtain input on the potential strategies. Details on the stakeholder process are presented in Appendix D.
3. **Scenario evaluation** (Task 4) – Informed by stakeholder input, Cascadia organized strategies into a short-term scenario for diversion modeling and a long-term scenario for future consideration. Selected strategies are responsive to stakeholder preferences and preserve choice. Cascadia applied its in-house diversion model to estimate cost and diversion potential for each scenario; the results, described in this chapter, and other quantitative and qualitative criteria were used to inform the recommendations developed in Chapter 4. Model outputs are presented in Appendices C2–C6.

#### 3.1 Strategy Identification and Initial Screening

Cascadia identified potential strategies based on successful waste prevention and diversion practices from other peer and benchmark regions in the United States. Practices may apply to specific geographic regions of Jefferson County. Distinct regions include the central business district, the urban services district, suburban cities, and unincorporated areas.

Appendix C1 lists potential waste reduction and recycling best management strategies for Louisville/Jefferson County. Strategies are organized by sector and by diversion strategy type, as listed in Table 3.

### 3. STRATEGY ASSESSMENT, STAKEHOLDER PROCESS, AND SCENARIO DEVELOPMENT

Table 3. Organizing Structure for Potential Strategies

Sectors	Diversion Strategy Types
<ul style="list-style-type: none"><li>• Residential, including single-family and multifamily (RES)</li><li>• Industrial/Commercial/Institutional (ICI)</li><li>• Construction and Demolition (C&amp;D), Self-haul (SH), and Bulky</li></ul>	<ul style="list-style-type: none"><li>• Waste reduction and reuse</li><li>• Collections and processing</li><li>• Education and outreach</li><li>• Incentives and rates</li><li>• Regulations and enforcement</li></ul>

To conduct the initial screening, Cascadia rated each potential strategy using a three-point scale (high-medium-low) against the following evaluative criteria: cost, likely effectiveness at diverting tons from the landfill, feasibility, and risk. The evaluative criteria are described in Appendix B1 and the results of the initial screening are presented in Appendix B2. As described in the stakeholder engagement section below, the initial screening also incorporated input from local elected officials, municipal staff, and other city and community representatives; service providers and industry representatives; and residents, nonprofit organizations, and community groups.

## 3.2 Stakeholder Engagement

Stakeholder input and buy-in is essential to the success of any study, especially one with ambitious participation and diversion goals. Accordingly, Cascadia consultant team involved stakeholders in several ways as part of developing the Study. The consultant team scheduled site visits and meetings with service providers operating in Jefferson County to better understand the current programs and existing infrastructure. In addition, this project included four stakeholder workshops, described below. Appendix D contains more detail on the workshop content and materials.

### 3.2.1 Workshop 1: Opportunities and Challenges

The consultant team held a kick-off workshop on December 8, 2015 to review the project objectives, share success stories from around the country, and identify the opportunities and challenges for increasing diversion in Jefferson County.

The top three opportunities participants identified for the Study were education, incentives, and best practices.

- **Education** – Participants saw a need for more education for residents, businesses, and institutions about existing waste prevention, recycling, and composting opportunities.

## 3. STRATEGY ASSESSMENT, STAKEHOLDER PROCESS, AND SCENARIO DEVELOPMENT

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- **Incentives** – Combining incentives with price signals, such as including the cost of recycling collection in an integrated fee structure, is a key opportunity to increase participation.
- **Best Practices** – Participants felt strongly that the County should not “reinvent the wheel” and should look to best practices that have been successful in other communities.

Stakeholders identified the top three **challenges** or **constraints** facing the Study to be low landfill costs, apathy or lack of education, and need for more infrastructure.

### 3.2.2 Workshop 2: Goals, Objectives, and Guiding Principles

The consultant team held the second workshop on July 27, 2016 and focused on the priorities, goals, and objectives for the Study. The team also presented results from the waste characterization study. The stakeholders reviewed the goals and objectives that were adopted in Sustain Louisville, the region’s sustainability plan. They also discussed and identified 10 guiding principles for the Study, which are listed below.

1. **Invest in education.** Allocate resources to ensure full participation in high diversion programs.
2. **Everyone must play a part.** Increase communication, collaboration, and participation among stakeholders across all sectors and the entire county.
3. **Lead by example** in local government waste prevention and recycling to show commitment and serve as a model for others.
4. **Build on what works.** Maximize existing programs and infrastructure; adopt demonstrated best practices.
5. **Align incentives.** Financially encourage waste prevention and recycling before disposal.
6. **Put materials to their highest and best use.** Focus on prevention, reuse, and recycling before waste-to-energy and beneficial use.
7. **Create jobs and economic growth** from reuse and recycling through manufacturing with recycled materials.
8. **Support market development.** Take actions that create a market “pull” for recycled materials, thereby increasing the incentive to remove them from the waste stream by both consumers and recycling processors.
9. **Ensure strategies are cost-effective.** Balance goals and objectives with cost-effective and efficient strategies for achieving them.
10. **Maximize the use of the private sector** for the delivery of waste and recycling services including collection and processing.

### 3.2.3 Workshop 3: New or Expanded Policies, Programs, and Infrastructure Strategies

The consultant team held the third workshop on August 11, 2016 to identify potential new or expanded policies, programs, and infrastructure strategies. The team also presented results from the benchmark survey of high diversion and peer communities. Stakeholders reviewed a long list of potential new or expanded strategies that were categorized by generator type: residential; institutional, commercial, and industrial; and construction and demolition, self-haul, and bulky. Stakeholders discussed the potential strategies and conducted an exercise to identify and place their preferred strategies into short-term and long-term scenarios. The potential strategies reviewed by stakeholders are presented in Appendix C1. The final strategies selected for the scenario evaluation are responsive to this stakeholder input and are presented in Appendix C2.

### 3.2.4 Workshop 4: Implementation Strategies and Institutional Arrangements

The consultant team held the final stakeholder workshop on August 30, 2016 to identify implementation strategies and institutional arrangements. To obtain stakeholder input and to begin to develop consensus, representatives from three different stakeholder groups—residents, non-profits, and community groups; city and community representatives; and service providers—provided feedback in three panel discussions. Each panelist was asked to respond to the following two questions:

1. Should we implement county-wide minimum standards for recycling and composting that are designed to increase diversion?
2. How can we best work together to implement county-wide diversion strategies?

Appendix D9 contains a summary of stakeholder responses to these questions.

The stakeholder process was key to identifying policies, programs, and infrastructure strategies to recommend in the Study that are most appropriate for Louisville Metro and have the greatest opportunity to achieve its goals.

## 3.3 Scenario Evaluation

Using the results of the initial screening and in response to stakeholder input, Cascadia organized the potential strategies into short-term and long-term scenarios. The short-term scenario represents actions to be taken between 2017 and 2026. Strategies in the short-term scenario expand available collection service and education, prioritizing voluntary participation in waste diversion programs over mandates through regulations. These strategies are described in Appendix C1. The long-term scenario represents

### 3. STRATEGY ASSESSMENT, STAKEHOLDER PROCESS, AND SCENARIO DEVELOPMENT

actions to be considered starting in 2026 based on measured progress toward diversion goals, developments in waste prevention and diversion technologies and markets, changes in the waste stream, and other factors that may affect waste prevention and diversion potential at that time. Long-term strategies may include additional expansion of education and outreach programs, incorporation of new regulations, additional collection, and expanded processing. Strategies in the short- and long-term scenarios are included in Table 4, below.

Table 4. Strategies in Short- and Long-Term Scenarios

Short-term scenario	Long-term scenario
<ul style="list-style-type: none"> <li>• Waste reduction and reuse education</li> <li>• Expanded marketing efforts and partnerships with reuse retailers</li> <li>• Expanded awards and recognition programs</li> <li>• County-wide service-level and signage standards</li> <li>• Bulky waste processing</li> <li>• Technical assistance</li> <li>• Reuse of materials in road construction</li> <li>• Enhanced enforcement of yard waste ban</li> <li>• Self-haul separation requirement</li> <li>• C&amp;D debris processing ordinance</li> </ul>	<ul style="list-style-type: none"> <li>• Product stewardship programs</li> <li>• Reuse events and online materials exchange</li> <li>• Universal food scrap composting</li> <li>• Expanded curbside recycling list</li> <li>• Dry- and mixed-waste processing</li> <li>• Wet/dry collection</li> <li>• Every-other-week trash collection</li> <li>• Require collection of organics</li> <li>• Mandatory recycling and composting</li> <li>• Landfill disposal bans</li> <li>• Pilot regional collection</li> <li>• Pay-as-you-throw</li> </ul>

Cascadia evaluated the short-term scenario using an in-house modeling tool. Scenario evaluation included the following four stages.

1. **Projecting baseline waste generation, diversion, and disposal estimates to 2026.** Using population, housing, and employment projections applied to per-capita and per-employee waste generation, diversion, and disposal factors, Cascadia projected the growth in the waste stream and diversion assuming business as usual, meaning no new city, county, or private initiatives to prevent or divert waste. These projections, presented in Appendix C2, form the basis for quantifying the additional materials that can be recovered from the waste stream over the next 10 years. Please refer to Appendix C3 for more detail on the projection calculations.

### 3. STRATEGY ASSESSMENT, STAKEHOLDER PROCESS, AND SCENARIO DEVELOPMENT

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2. **Characterizing strategies to increase diversion.** Working closely with Louisville Metro staff, Cascadia finalized the list of short-term strategies to evaluate for diversion potential and cost. Strategies addressed all sectors (residential; industrial, commercial, and institutional; self-haul; and construction and demolition). Using the consultant team’s in-house database and expertise, as well as data from Louisville Metro staff and the Task 1 and Task 2 reports conducted for this project, we estimated recovery rates and costs for each option as model inputs. A summary of the diversion inputs is presented in Appendix C3, and a summary of the cost inputs is presented in Appendix C4.

3. **Evaluating costs and diversion potential.** A core element of the work to craft this Study involved using Cascadia’s in-house model to quantify the impacts and costs of alternative strategies on Jefferson County’s waste stream. This model calculated diversion rates and costs of each option from 2016 to 2026. Summary results by year are presented in Appendix C5 ( tonnages) and Appendix C6 (implementation costs). For modeling purposes, some individual strategies selected for the short-term scenario were bundled together to avoid double-counting the effects of strategies that work together (see Appendix C3 for details on bundling). Model outputs included tonnages diverted, overall costs for the strategies, and per-ton costs for the strategies. If all the recommended programs in the short-term scenario are implemented and achieve the expected outcomes, Jefferson County can increase its diversion rate from 49 percent in 2016 to 58 percent in 2026. The total cost of implementing the recommended policies, programs, and infrastructure is estimated to be \$7.5 million over the 10 years, measured in 2016 dollars, for an average cost of \$6 per ton. A summary of modeling results is presented in Chapter 4: Recommendations.

4. **Developing the recommendations.** The final stage was to recommended final strategies for the short-term scenario and draft the Study to achieve Louisville Metro’s diversion and broader sustainability goals embedded in the Sustainable Louisville Plan.

# 4. RECOMMENDATIONS

This chapter presents the recommendations from the Study to move Jefferson County from its 49 percent diversion rate in 2016 towards a new “90%-90%” goal. This represents a revision of the current 90 percent diversion goal to a goal to have 90 percent of customers participating in recovery programs that divert 90 percent of recoverable materials by 2042.

The recommendations consist of an integrated package of policies, programs, and infrastructure investments that have been vetted through the stakeholder process and then analyzed by Cascadia to determine their impact and cost-effectiveness. If adopted, residential, institutional, commercial, self-haul, and C&D customers will all experience improvements to their service offerings, resulting in improved access to collection programs, consistency in collection and education throughout the county, and increased diversion.

The recommendations consist of 21 actions and initiatives encompassing new education, technical assistance, and marketing programs, enhanced partnerships, revised collection systems, embedded fee structures, selected bans, and new ordinances. The Study adheres to eight guiding principles:

1. It results from **stakeholder input**—participants in the stakeholder engagement process assessed all included actions.
2. It **provides a foundation** for county-wide advancement towards achieving the 2042 goal.
3. It is designed to be **acceptable** and work for the County’s **private sector partners**—including haulers, recyclers, and MRF operators—using existing infrastructure and leveraging their capabilities to enable them to continue providing valuable and effective services.
4. It **preserves choice**. As is currently the case, customers and incorporated cities will continue to be able to select their preferred waste hauler and recycling service providers. However, consideration should be given to selecting and using a single service provider within some geographic areas of the unincorporated county.
5. The Study assures that **essential services**—waste, recycling, and yard waste collection, as well as self-haul and C&D facilities—**are in place** and/or accessible to all customers. Importantly, everyone will have the opportunity to recycle cost effectively and conveniently.
6. It is intended to provide a high level of **consistent, county-wide quality** education and outreach services.
7. It **strives to eliminate financial and other barriers** to recycling and yard waste collection.
8. It is designed to be **affordable and cost effective** to create a solution that balances high diversion with reasonable cost.

## 4. RECOMMENDATIONS

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Figure 6 provides an overview of Jefferson County’s trajectory toward its “90%-90%” goal, including the policies, programs, and infrastructure investments required to achieve that goal by 2042. Over time, these investments will dramatically increase participation and lower per-unit diversion costs. In the short-term, implementation of the Study recommendations is expected to increase the County’s diversion rate to 58 percent from the baseline rate of 49 percent and achieve an “80%-70%” intermediate milestone, with 80 percent of customers participating and correctly diverting 70 percent of recoverable materials overall. Recoverable materials are materials that are technically recoverable through recycling, composting, energy production, or beneficial reuse and have processing facilities or markets in the Louisville region.

The Study focuses on immediate strategies to expand available service and education with limited regulation, pushing voluntary participation in waste diversion programs. In 2026, the County will be in a strong position to decide on what long-term adjustments to make to its programs and what new programs and policies—such as increased education and the implementation of new regulations—to achieve its recommended 2042 “90%-90%” goal.

**Figure 6. Jefferson County’s “90%-90%” Trajectory**  
 90 percent of customers participating in recovery programs that divert 90 percent of recoverable materials by 2042



Program, Policy, and Infrastructure Strategies	Res	ICI	SH	C&D
Waste reduction and reuse education	X	X		X
Partner with local reuse stores	X		X	
Residential county-wide service-level standards: carts provided for recycling, standardized bins and labels, and embedded fees	X			
Bulky waste processing	X			
Expanded marketing program, plus youth education, partnerships with schools, and resident champions	X	X	X	X
Technical assistance and toolkits	X	X		
Awards and recognition	X	X		
Standardized bins, labels, and adequate infrastructure for multifamily and commercial	X	X		
County-wide service-level standards for self-haul facilities: adequate infrastructure; standardized bins and facility signage; and preferential fees for recycling			X	
Separation of self-haul			X	
Reuse materials in road construction				X
Green building				X
C&D processing ordinance				X
Yard waste disposal ban enforcement	X	X	X	

Program, Policy, and Infrastructure Strategies
Product stewardship
Reuse events
Online material exchange forum
Universal food scrap composting
Expanded curbside recycling list
Dry waste processing
Wet/dry collection
Mixed waste processing
Every-other-week trash collection
Require collection of yard waste and food scraps
Mandatory recycling
Mandatory yard waste and food scraps composting
Landfill disposal bans
Pilot regional collection
Pay-as-you-throw

**KEY TERMS & DEFINITIONS**  
 Res = Primarily single-family waste      SH = Self-hauled waste  
 ICI = Institutional, commercial, and industrial waste      C&D= Construction & demolition debris

1. Diversion rate
2. 80% participation and 70% diversion of recoverable materials.
3. 90% participation and 90% diversion of recoverable materials.

The recommended strategies (a package of programs, policies, and infrastructure) have been customized for each customer segment and waste sub-stream. While stakeholders initially reviewed all the individual strategies, the consultant team **recommends** that the Louisville Metro adopt county-wide service level standards—bundling together and implementing a uniform set of programs and policies throughout the county. The key bundle is residential recycling service standards, which combines the individual strategies of using carts for recycling, standardizing labels, and embedding recycling fees into the cost of garbage collection for all customers. By establishing these standards and adopting them throughout, the county will realize economies of scale, and customers will find it much easier and more convenient to recycle and otherwise manage their waste streams. To move forward, the County will need to invest in developing the framework for this approach. In addition, the County will need to build consensus among key stakeholders as the study process revealed that some key players have concerns and issues to be addressed, even as many stakeholders appear to be generally supportive of this new approach.

Recommended programs, policies, and infrastructure strategies by customer segment and waste sector are described below.

### 4.1 Recommendations: Residential Sector

With a 2015 diversion rate of 18 percent and a disposed waste stream that contains substantial quantities of valuable curbside recyclable materials, the potential for increased diversion from the residential sector is significant. Specifically, in 2015, residents disposed nearly 310,000 tons of waste, of which more than one-third (36%) was currently recoverable through existing curbside recycling, drop-off recycling, or yard waste composting programs. Another 20 percent could potentially have been recovered through food scrap composting, and 10 percent had the potential for donation. Accordingly, this Study recommends a package of programs designed to lift the residential diversion rate to 30 percent, resulting in residents recycling and composting approximately additional **51,000 tons** by 2026 and source-reducing (that is, not generating) another **2,100 tons**. This package consists of seven strategies described below.

#### Waste Reduction and Reuse Education

A comprehensive waste reduction and education campaign would focus on helping single-family, multifamily, and self-haul residential customers reuse and reduce the generation of a variety of waste materials, thereby saving customers money. The education program would begin in 2018 and consist of three marketing campaigns over the 10 years that address wasted food; durable goods, electronics, bulky items, and other reusable goods; and waste in general. This strategy is expected to **source-reduce 1,700 tons** of waste annually by 2026.

### Expanded Marketing Campaign for Recycling and Composting

An expanded residential marketing effort would promote recycling and composting through websites and mailings. It would rely on the proven principles of community-based social marketing, add images to materials, and standardize the terms used in these materials. This initiative also includes youth education, partnerships with schools, and outreach efforts to engage homeowner associations through a resident champion program. This mix of improved materials and outreach is anticipated to **divert an additional 3,400 tons** of waste annually by 2026, with implementation beginning in 2018.

### Technical Assistance and Standards for Signage and Adequate Infrastructure

Technical assistance combined with standardized signage and adequate recycling infrastructure for the multifamily sector will result in an estimated **2,000 tons of additional diversion** annually in 2026. Technical assistance includes outreach to help property managers “right-size” their recycling service and door-to-door outreach to residents.

### Contract for Processing and Recovery of Urban Services District Bulky Waste

This strategy involves processing and recovery of recyclable materials from the bulky waste stream collected by the Urban Services District from residents three times per year via the “junk and bulk” trash service. This effort involves contracting with the private sector for the processing and would begin in 2018, resulting in an additional **7,800 tons diverted** annually by 2026. The potential 2026 recovery may be higher, if bulky waste collected by suburban communities and in unincorporated areas were processed for recovery of recyclable materials.

### Partnerships with Reuse Retailers

Enhanced partnerships with reuse stores—such as Goodwill Industries, the Salvation Army, and St. Vincent de Paul—would expand the opportunities for residents to drop off reusable products, increasing **source reduction by 500 tons** annually by 2026.

### County-wide Service Level Standards for Single-family Recycling

The Study also recommends expanding county-wide service level standards for single-family recycling. Expanding county-wide service level standards is a comprehensive, integrated approach to making recycling and composting more convenient, accessible, and cost-effective for residents, government, and haulers alike. It also ensures that residents across Jefferson County have an equal opportunity to recycle. The suite of activities that the consultant team recommends incorporating into county-wide service levels include:

- Providing carts for recycling with every-other-week collection to all single-family customers throughout the county. New carts would be provided for households with 18 gallon bins.

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- Standardizing collection containers and providing the same labels and signage for all customers. New labels would be provided for households that currently have cart-based service.
- Embedding the fees for recycling with the cost of garbage collection, so that the customer gets one all-inclusive bill and no longer must opt-in to recycling service. Customers would be able to opt out of having a cart if desired, although their bundled rate would still include recycling.

This standardized service approach is estimated to **divert 22,100 tons** per year by 2026, representing more than 40 percent of the total increase in recovery associated with the recommended package of programs for the residential sector. This strategy recovers the second largest number of tons among all strategies recommended in this Study (following the C&D processing ordinance). Importantly, standardization complements and enhances the education and outreach efforts that are also recommended, making the whole “greater than the sum of the parts.”

### Enhanced Enforcement of Yard Waste Disposal Ban

Increased enforcement of the yard waste disposal ban yields a projected **15,700 tons diverted** to composting annually by 2026.

## 4.2 Recommendations: Industrial, Commercial, and Institutional (ICI) Sector

Louisville’s businesses—also called the industrial, commercial, and institutional (ICI) sector—currently divert an impressive 42 percent of their waste stream, with 243,000 tons recovered out of a total of nearly 580,000 generated. Nonetheless, significant percentages of the ICI disposed waste stream are recoverable: 23 percent of the ICI disposed waste stream could be recycled at curbside, 20 percent is suitable for drop-off recycling or donation, and another 23 percent is compostable.

The six recommended diversion programs for the ICI sector take aim at these materials. Together, these programs divert nearly an additional **23,000 tons**, increasing the ICI diversion rate to 46 percent in 10 years. The key programs and initiatives that achieve this increase are described below.

### Expanded Marketing Campaign for Recycling and Composting

Expansion and improvement of the county’s business marketing program consists of two major campaigns: one to promote food scrap collection and the other to promote general recycling. This effort includes new signage, a consistent use of recycling images and terminology, application of social marketing approaches, and development and distribution of toolkits to business owners. By 2026, this measure is expected to **divert 8,900 additional tons** annually.

### Technical Assistance

Providing comprehensive on-site technical assistance to businesses generators is estimated to **divert 4,100 additional tons** annually by 2026. This one-on-one service would be focused initially on helping customers obtain containers and set up new collection services, train employees, and provide other assistance as needed to managers and employees.

### Expanded Awards and Recognition Program

Expanding the current awards and recognition program to all Jefferson County businesses—beyond the current program for food-generating businesses in the Central Business District—is projected to **divert 600 tons** annually by 2026.

### Standards for Signage and Adequate Infrastructure

Establishing standards and guidelines for signage, containers, and adequate recycling infrastructure for businesses is expected to make it much easier to recycle and compost, increasing participation and recovery levels and resulting in a projected **1,600 additional tons diverted** annually by 2026.

### Waste Reduction and Reuse Campaign

A robust waste reduction and reuse targeted education campaign for businesses, including businesses that self-haul waste, would focus on food waste prevention and on electronics, bulky wastes, and related materials. Two separate marketing campaigns are recommended over the study period, resulting in **2,000 additional tons of source reduction** annually by 2026.

### Enhanced Enforcement of Yard Waste Disposal Ban

Enforcing the yard waste ban for all customers, including those in the ICI sector, will divert an estimated **7,900 additional tons** per year by 2026.

## 4.3 Recommendations: Self-haul Materials

Transfer stations and landfills in Jefferson County lack uniform and comprehensive signage about recycling and composting and other services designed to maximize diversion. Accordingly, the recovery rate for materials in this segment of the waste stream is only 7 percent, even though nearly 60 percent of the more than 110,000 tons disposed in 2015 were recoverable or potentially recoverable.

Four recommended actions for the self-haul stream are designed to collect over **45,000 additional tons**, pushing the diversion rate up to 44 percent, an increase of 37 percentage points over the baseline. This is accomplished through the strategies described below.

### County-wide Service Level Standards for Self-haul Facilities

As with the residential strategy, experience elsewhere suggests that developing and requiring a uniform set of county-wide standards to ensure recycling and yard waste composting are available at every transfer and disposal facility throughout the county will result in a highly cost-effective increase in tons recovered. These standards would require that disposal sites that accept self-haul garbage have adequate recycling infrastructure and accept common recyclables (such as cans, bottles, and paper), yard waste, clean wood, metals, and bulky/durable/textile items for recycling and composting *at fees less than the fee for garbage disposal*. The materials would then be sent to recycling and processing facilities, including dry waste processing for bulky items. These standards would be combined with standardized signage and containers to **divert 17,100 tons** annually by 2026.

### Self-Haul Separation Requirement

Requiring self-haul customers to separate materials for recycling at all transfer and disposal sites works in tandem with the establishment of county-wide service level standards for recycling at self-haul facilities. The requirement, once supported by adequate infrastructure and standardized signage and gently enforced by city and county staff, is projected to **divert 24,900 tons** annually by 2026. The success of the County's yard waste disposal ban demonstrates the efficacy of this approach as well as its acceptability to the public with the proper level of education and outreach.

### Enhanced Enforcement of Yard Waste Disposal Ban

Enforcing the yard waste disposal ban at self-haul facilities is projected to result in an additional **4,500 tons diverted** annually by 2026.

### Expanded Recycling Marketing Campaign and Partnerships with Reuse Retailers

Creating partnerships with local reuse organizations and expanding the marketing efforts at self-haul facilities is projected to **source-reduce 400 tons** of waste annually by 2026.

## 4.4 Recommendations: Construction and Demolition Materials

With more than 515,000 tons diverted from the landfill, C&D materials accounted for more than 60 percent of all materials recycled, composted, or otherwise recovered in 2015. This large quantity was a function of the weight and density of these materials (e.g., concrete) and the favorable economics of diverting these heavy materials rather than paying to dispose of them. With an 81 percent diversion rate in 2015, the construction industry contributed significantly to the County's current 49 percent aggregate

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diversion rate. Nonetheless, the waste characterization study showed that nearly 60 percent of the remaining 124,000 tons of C&D waste disposed was currently or potentially recoverable.

The four recommended activities for the C&D sector are projected to recover an additional **55,000 tons**, resulting in an 89 percent diversion rate for this segment of the waste stream. These activities are described below.

### Waste Reduction and Reuse Campaign

Targeted education and outreach on how to reduce and reuse C&D materials promotes activities such as salvage, deconstruction, and construction techniques that minimize waste. This program is projected to result in **1,700 tons of source reduction** annually in 2026.

### Reuse of Materials in Road Construction

Expanding the effort to use asphalt shingles in road construction and maintenance is projected to **divert 5,300 additional tons** annually in 2026 and ensure sustainability of this market for years to come. Recycled asphalt shingles are already allowed in the Kentucky Department of Transportation's construction specifications for asphalt pavement.

### C&D Debris Processing Ordinance

Implementing and enforcing an ordinance to require that all C&D materials be sent for processing would focus on corrugated cardboard, metals and appliances, asphalt shingles, clean wood, and aggregates. These materials are found in such significant quantities in the C&D waste stream that this action alone could **divert 49,000 new tons** annually by 2026. This strategy diverts the single largest number of tons among all actions recommended in this Study.

The success of the County's yard waste disposal ban demonstrates the efficacy of this approach as well as its acceptability to the public with the proper level of education and outreach. Jefferson County could expect similar results from this ordinance and the emergence of private-sector processors and end-markets that are willing and able to take this material.

### Expanded Marketing Campaign for Recycling, Composting, and Green Building

Two additional recommended programs would together **divert an additional 620 tons annually**: expanding the C&D debris marketing program (600 tons) and promoting green building (20 tons). While not a big producer of additional recycled material in the near term, the green building initiative would result in less waste generated over time and increased energy and water efficiency, all of which would contribute to a more resilient and prosperous city and county.

## 4.5 Summary Impacts and Estimated Costs of the Recommendations

### 4.5.1 Increased Diversion: All Sectors Contribute; New Service Standards and Requirements Are Most Effective

If all the recommended programs are successfully implemented and achieve their expected outcomes, Jefferson County's diversion rate in 2026 will increase from a business-as-usual level of 876,000 tons or 49 percent to over 1 million tons, resulting in a 58 percent diversion rate as summarized in Table 5. In addition, Jefferson County would generate nearly 6,000 fewer tons of waste than in the business-as-usual scenario.

Table 5. Diversion Tons and Rates in 2026 (with and without new strategies)

Sector	Business as Usual		New Strategies		Difference	
	Tons Diverted	Diversion Rate	Tons Diverted	Diversion Rate	Change in Tons Diverted	% Increase in Tons Diverted
Residential	72,000	18%	123,000	30%	51,000	71%
ICI	251,000	42%	274,000	46%	23,000	9%
Self-haul	9,000	7%	54,000	44%	45,000	502%
C&D	544,000	81%	599,000	89%	55,000	10%
<b>Total</b>	<b>876,000</b>	<b>49%</b>	<b>1,051,000</b>	<b>58%</b>	<b>175,000</b>	<b>20%</b>

*Note: figures may not sum to totals due to rounding; excludes approximately 6,000 tons of source reduction from the new strategies.*

As shown in Figure 7, all sectors will contribute significantly to this achievement, with the C&D sector accounting for just under one-third of the total diverted tons, residential at 29 percent, self-haul at 26 percent, and the ICI sector at 13 percent. C&D diversion will increase the most in tonnage terms, reflecting the relatively dense and heavy nature of this material, although the material is relatively low value. The lower percentage for ICI reflects the fact that this sector already does a good job of recycling and composting, especially compared to the residential sector. In percentage terms, the greatest increase will come from self-haul, with diversion rising from 7 to 44 percent. Most of the self-haul diversion increase will result from providing adequate recycling infrastructure and requiring separation at transfer and disposal sites.

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Figure 7. Source of Additional Tons Diverted and Source Reduced in 2026, by Sector

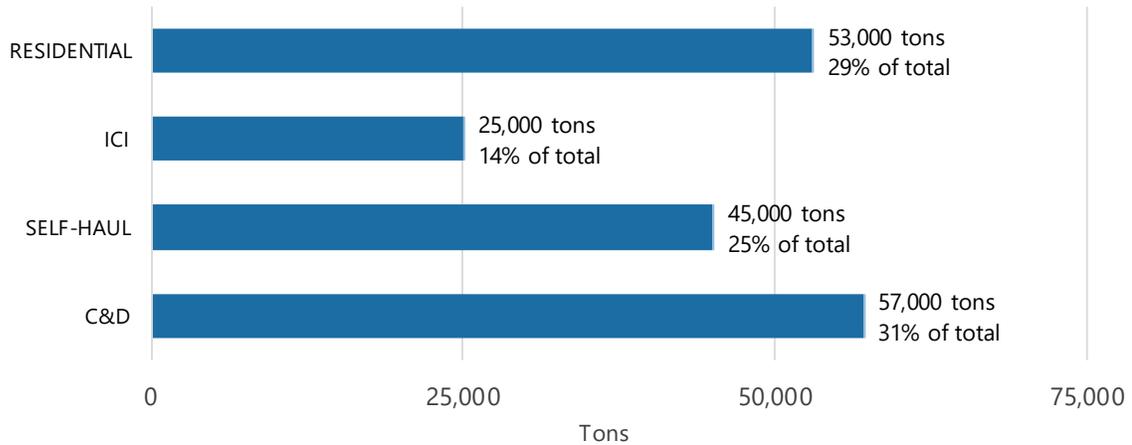
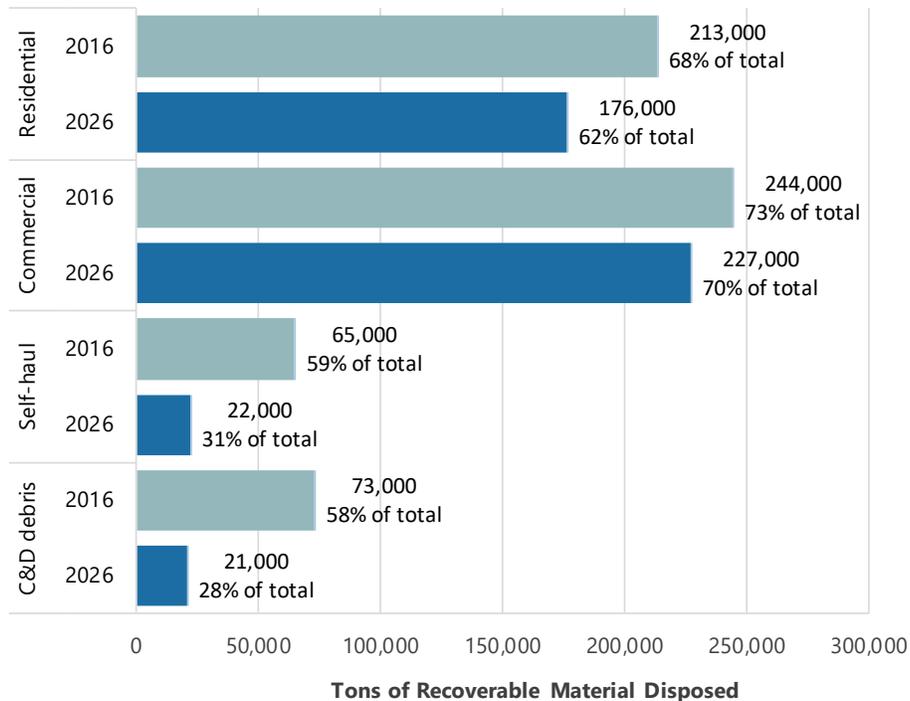


Figure 8 shows the projected change in disposed waste between 2016 and 2026 by sector. The quantity of waste sent to landfills declines across the board, most notably among recoverable waste from the self-haul and C&D sectors. This figure also shows that opportunities will remain for additional diversion, with a substantial portion of both residential and commercial disposed waste streams still recoverable in 2026.

Figure 8. Projected Recoverable Disposed Waste 2016 and 2026



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Finally, Table 6 organizes the strategies into three key program types rather than the sector affected:

- Developing and implementing new **service standards** for residential and self-haul as well as standardizing signage and infrastructure for businesses.
- Adopting and enforcing **ordinances and contracts** regarding separation of self-haul materials, processing of C&D and bulky waste materials, and yard waste disposal.
- Conducting **education and marketing campaigns**, consisting of several programs benefiting all sectors.

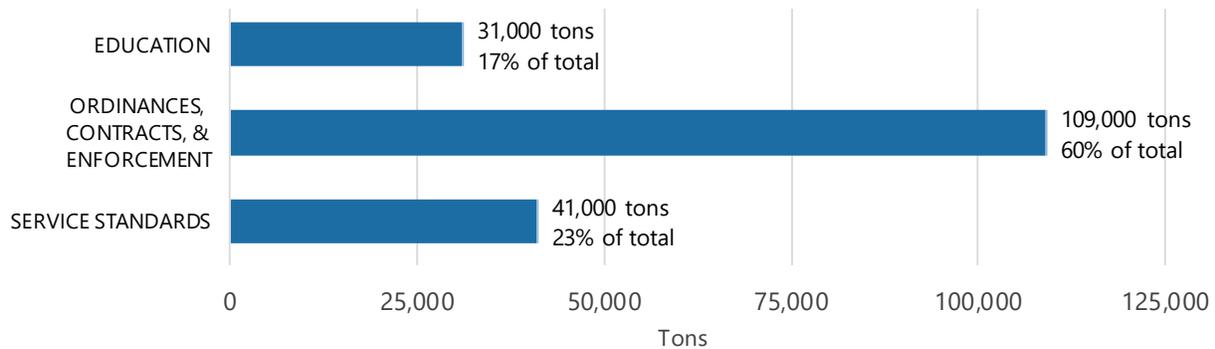
Table 6. Strategies by Program Type

<b>Service Standards</b> <ul style="list-style-type: none"><li>• County-wide service level standards for single-family recycling</li><li>• County-wide service level standards for self-haul facilities</li><li>• Signage standards and adequate infrastructure for multifamily residential and ICI</li></ul>
<b>Ordinances, Contracting, and Enforcement</b> <ul style="list-style-type: none"><li>• Enforcement of yard waste disposal ban for residential, self-haul, ICI, and C&amp;D<sup>7</sup></li><li>• Bulky waste processing of “junk and bulk” trash collected from USD customers</li><li>• C&amp;D ordinance that requires processing of all C&amp;D materials</li><li>• Self-haul separation requirement</li></ul>
<b>Education and Marketing</b> <ul style="list-style-type: none"><li>• Waste reduction and reuse education for residential, ICI, self-haul, and C&amp;D</li><li>• Partnerships with local reuse retailers for residential and self-haul</li><li>• Expanded marketing programs for residential, ICI, self-haul, and C&amp;D</li><li>• Technical assistance for multifamily and ICI</li><li>• Business awards and recognition</li><li>• Promoting green building</li><li>• Reuse materials in road construction</li></ul>

<sup>7</sup> Enforcement of the yard waste disposal ban applies to all sector but would not divert meaningful quantities from the C&D sector because C&D debris generators currently dispose minimal quantities of yard waste in landfills.

Figure 9 depicts the new tons diverted by type of program. Requirements and service standards are expected to divert the most additional tons, contributing over three-fourths of the total, followed by education and marketing. However, it is important to realize that many of these programs and policies are synergistic; for example, service level standards are more effective with a strong education and marketing campaign, and an education program will be less effective without service standards that ensure adequate infrastructure is available.

Figure 9. Source of Additional Tons Diverted and Source Reduced in 2026, by Program Type



### 4.5.2 Estimated Program Costs

The total cost to the County to implement the recommended policies, programs, and infrastructure in the 10-year term of this Study is estimated to be approximately \$7.5 million over 10 years (2016 to 2026), measured in 2016 dollars, as shown in Table 7.<sup>8</sup>

As summarized in Table 7, the average cost per ton is estimated to be \$6, with a high of \$33 per ton for developing and implementing new educational programs to a low of \$1 per ton for developing and enforcing service standards, ordinances, and contracts.

It is important to note that these costs do not include collection services costs impacts for individual residential customers. For example, in the short term, if the County adopted single-family service-level standards that require all haulers to provide cart-based recycling service bundled with garbage service, residential customers who do not currently subscribe to recycling would bear a new cost for the added service. Based on data collected in Volume 2 of this Study (*Collection System Assessment*), roughly 77 percent of households in the unincorporated area and 25 percent of households in incorporated cities outside the Urban Services District are expected to need to begin paying for new recycling services. The average cost of every-other-week recycling services is \$2 per month in incorporated cities and \$5 per month in unincorporated areas, although the exact cost to a specific household will vary given the wide

<sup>8</sup> A discount rate of 4.09% was applied to future costs to estimate the net present value in 2016 dollars.

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range of rates charges by haulers in the current system. Costs to unincorporated residents could be entirely offset if the County moved to a more efficient collection system with exclusive, competitive contracts in unincorporated areas, as discussed in Section 4.7.2 on page 49. These costs are external to the County's budget presented in Table 7.

The estimated costs incurred by the County also do not include any labor cost offsets from repurposing existing staff. Louisville Metro currently has five staff members currently assigned to recycling drop-off centers who could be repurposed for education, outreach, and technical assistance programs. This repurposing would offset some of the estimated education costs of this recommendation.

Table 7. Cumulative Costs 2016 to 2026 by Program Type (in 2016 dollars)

Program Type	Cost (2016 dollars)	Cost Per Ton
Service Standards	\$346,000	\$1
Ordinances, Contracts, & Enforcement	\$1,258,000	\$1
Education	\$5,847,000	\$33
<b>Overall</b>	<b>\$7,451,000</b>	<b>\$6</b>

Table 8 reallocates the costs shown in Table 7 to indicate how they align with customer class. Most of the costs borne by the County are associated with new programs and initiatives for the commercial sector, primarily associated with providing technical assistance. The self-haul and C&D sector costs are relatively low and are considered to be highly cost-effective. This is because the materials generated in these sectors are heavy and dense (though low value). In addition, private-sector processing costs are expected to be substantially offset by avoided landfill disposal costs.<sup>9</sup> The cost per ton for new residential sector programs is also relatively low, although these estimates do not include new subscription costs for household who currently lack curbside recycling service that meets service standards.

Table 8. Cumulative Costs 2016 to 2026 by Sector (in 2016 dollars)

Sector	Cost (2016 dollars)	Cost Per Ton
Residential	\$2,137,000	\$5
ICI	\$3,583,000	\$22
Self-haul	\$939,000	\$3
C&D	\$792,000	\$2
<b>Overall</b>	<b>\$7,451,000</b>	<b>\$6</b>

<sup>9</sup> Processing of bulky waste and C&D debris is estimated to cost approximately \$30 per ton (per local C&D waste processing expert), offsetting the current landfill cost of approximately \$30 per ton (per Waste Management). The per-ton processing cost is assumed to include any infrastructure costs required to establish processing.

## 4.6 Recommendations: Implementation Schedule

Table 9 presents the implementation schedule for new strategies. Medium blue cells indicate years in which the program is being implemented and shifting new tons from disposal to diversion or source reduction; light blue indicates that the program continues to divert material after full implementation. Most implementation activity and new costs occur in the medium blue cells.

Table 9. Implementation Schedule of New Strategies

Strategy		2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
<b>Single-family and Multifamily Residential</b>											
Waste reduction and reuse education	Design campaign #1	Implement	Design and implement campaign #2	Implement	Implement	Design and implement campaign #3	Implement	Implement	Implement	Implement	Implement
Partnerships with local reuse retailers	Start Partnerships	Continue Partnerships	Continue Partnerships	Continue Partnerships	Continue Partnerships	Continue Partnerships	Continue Partnerships	Continue Partnerships	Continue Partnerships	Continue Partnerships	Continue Partnerships
Expanded marketing program	Design campaigns	Implement	Implement	Implement	Implement	Implement	Implement	Implement	Implement	Implement	Implement
County-wide service level recycling standards		Develop and adopt standards	Roll out service	Roll out service	Roll out service	Enforce (ongoing)	Enforce (ongoing)	Enforce (ongoing)	Enforce (ongoing)	Enforce (ongoing)	Enforce (ongoing)
Signage standards, adequate infrastructure		Develop and implement standards	Continue to implement	Continue to implement	Continue to implement	Enforce (ongoing)	Enforce (ongoing)	Enforce (ongoing)	Enforce (ongoing)	Enforce (ongoing)	Enforce (ongoing)
Technical assistance	Design program	Implement	Implement	Implement	Implement	Implement	Implement	Implement	Implement	Implement	Implement
Bulky waste processing for USD		Procure/roll out processing	Continue to roll out processing	Continue processing	Continue processing	Continue processing	Continue processing	Continue processing	Continue processing	Continue processing	Continue processing
<b>Industrial, Commercial, and Institutional (ICI)</b>											
Waste reduction and reuse education	Design campaign	Implement	Implement	Implement	Design and implement	Implement	Implement	Implement	Implement	Implement	Implement
Expanded marketing program	Design campaigns	Implement	Implement	Implement	Implement	Implement	Implement	Implement	Implement	Implement	Implement
Signage standards, adequate infrastructure		Develop and adopt standards	Roll out standards	Roll out standards	Roll out standards	Enforce (ongoing)	Enforce (ongoing)	Enforce (ongoing)	Enforce (ongoing)	Enforce (ongoing)	Enforce (ongoing)
Technical assistance	Design program	Implement	Implement	Implement	Implement	Implement	Implement	Implement	Implement	Implement	Implement
Business awards and recognition		Design and implement	Implement	Implement	Implement	Implement	Implement	Implement	Implement	Implement	Implement

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Strategy	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
<b>Self-haul (Residential and ICI)</b>										
Partnerships with local reuse retailers	Start Partnerships	Continue Partnerships	Continue Partnerships	Continue Partnerships	Continue Partnerships	Continue Partnerships	Continue Partnerships	Continue Partnerships	Continue Partnerships	Continue Partnerships
Expanded marketing program for self-haul	Design campaign	Implement	Implement	Implement	Implement	Implement	Implement	Implement	Implement	Implement
County-wide service level facility standards		Develop and adopt standards	Roll out standards	Enforce (ongoing)	Enforce (ongoing)	Enforce (ongoing)	Enforce (ongoing)	Enforce (ongoing)	Enforce (ongoing)	Enforce (ongoing)
Self-haul separation requirement		Develop and adopt requirement	Roll out requirement	Roll out requirement	Enforce (ongoing)					
<b>Construction and Demolition (C&amp;D)</b>										
Waste reduction and reuse education	Design campaign	Implement	Implement	Implement	Implement	Implement	Implement			
Expanded marketing program	Design campaign	Implement	Implement	Implement	Implement	Implement	Implement	Implement	Implement	Implement
Promoting green building	Design campaign	Implement	Implement	Implement	Implement	Implement	Implement	Implement	Implement	Implement
Reuse materials in road construction	Design and implement	Design and implement	Design and implement	Design and implement	Implement (minimal ongoing)					
C&D processing ordinance			Develop and adopt ordinance	Start-up enforcement	Start-up enforcement	Enforce (ongoing)				
<b>Cross-cutting</b>										
Yard waste disposal ban enforcement	Enhance enforcement	Enhance enforcement	Enforce (ongoing)	Enforce (ongoing)	Enforce (ongoing)	Enforce (ongoing)	Enforce (ongoing)	Enforce (ongoing)	Enforce (ongoing)	Enforce (ongoing)

### 4.7 Future Considerations

This section presents metrics to help Louisville Metro track progress on the 10-Year recommendations from this Solid Waste Study and inform decisions on which long-term strategies to implement in 2026. It also describes recommended long-term strategies, which include additional expansion of education and outreach programs or incorporation of new regulations that introduce mandatory recycling for select materials.

#### 4.7.1 Evaluation Metrics

To create a set of metrics to guide the development of the Solid Waste Study and measure progress towards all established goals, Cascadia reviewed metrics and performance measures used by high-diversion jurisdictions. These additional metrics will enable Louisville Metro to better understand its program performance and determine when and how to reallocate resources from areas of success to areas of challenge. These metrics will be particularly important to measure in 2026 when Louisville/Jefferson County reaches the decision point.

Recommended key metrics are:

- **Separate recycling rates for municipal solid waste recycling and composting by sector and for construction and demolition debris diversion**—both in total and by the individual sectors of residential; industrial, commercial, and institutional (ICI); and self-haul.
- **Per capita disposal, recycling, composting, and generation quantities**—which help normalize measurements to separate population and employment growth over time from trends in waste generation and recycling.
- **Diversion participation rates**—the percentage of garbage customers that have and use recycling and composting collection service, by sector.
- **Recoverability potential**—the percentage and tons of waste disposed of as garbage that could be recycled or composted, in total and by sector.
- **Capture rates**—the percentage of material recovered from the waste stream (recycled and composted tons divided by total generated tons) for targeted material(s), overall and for selected sectors.
- **Tons of materials reused or alternatively used**—for durable and/or reusable products that would otherwise be destined for disposal.

These recommendations are based on a mix of metrics that are tracked by other high-diversion programs nationwide and that can provide insights into challenging materials and areas of opportunity for the solid waste program. Tracking recoverability potential and capture rates will require future waste

composition studies to obtain necessary data. Many jurisdictions conduct waste characterization studies approximately every five years. Additional detail regarding metrics can be found in Appendix B.

### 4.7.2 Long-term Strategies

The strategies recommended in the previous sections are projected to move Louisville Metro to a 58 percent diversion rate in 2026 with an 80 percent participation rate and 70 percent diversion of recoverable materials. In 2026, Louisville Metro will reach a decision point at which it will need to reassess program performance, system infrastructure, waste stream components, and capture rates in order to select the next suite of strategies to reach a 90 percent participation rate with 90 percent diversion of recoverable materials. Long-term strategies are expected to continue education and outreach efforts and to increase regulation and processing options.

Long-term programmatic strategies recommended for consideration in 2026 include the following.

#### New Education and Outreach

Build on the expanded education and outreach efforts with new programs.

- **Reuse events.** Establish and promote community reuse events and repair cafés.
- **Online material exchange forum.** Establish and promote online forums for material exchange.

#### Expanded Collection Services

Expand basic recycling and yard waste services to collect more materials and, when appropriate, reduce garbage collection frequency.

- **Expand the list of materials accepted in curbside recycling** to include items such as rigid plastics, scrap metals, or clean and bagged films.
- **Provide universal food scrap composting.** Provide food scrap and compostable paper collection to all residential customers.
- **Every-other-week garbage collection.** Reduce garbage collection to every other week, in combination with weekly food and yard waste collection.
- **Expand two-bin wet/dry collection system** currently implemented in the Central Business District to more large food-generating businesses and potentially to single-family and multifamily residential customers.

### Additional Processing Options

Support additional processing options to sort and divert remaining waste.

- **Dry waste processing.** Implement dry waste collection by establishing special dry waste routes and then processing the dry waste to recover recyclable materials.
- **Mixed waste processing.** Process disposed waste loads to recover recyclable or compostable materials.

### Additional Policies and Regulations

Adopt additional policies and regulations to take diversion to the next level.

- **Additional landfill disposal bans.** Expand the landfill ban on yard waste by adopting ordinances to ban specific recyclable or toxic materials from entering local transfer stations and landfills.
- **Require collection of yard waste and food scraps.** Require all licensed haulers to provide access to collection of yard waste and food scraps.
- **Mandatory recycling, yard waste, and food scraps composting.** Implement and enforce laws that require waste generators to recycle and compost target materials (e.g., paper, glass, metals).
- **Product stewardship programs.** Promote national and regional product stewardship by supporting extended producer responsibility programs.

### Stronger Incentives

Use market principles and pricing signals to promote diversion and waste reduction.

- **User fees for waste service.** In cities that do not currently charge user fees for waste service, eliminate the inequity and lack of transparency that arises from providing this service through taxes by coordinating a conversion to a system of user fees with a concurrent and equivalent reduction in taxes. User fees would present baseline solid waste services as a total cost and assess additional charges at specified rates for special and additional services. As with other utilities, such as water and electricity, customers would be expected to pay for the waste management services they use. Cities can also set rates to encourage waste diversion.
- **Implement pay-as-you-throw (PAYT) collection fees** (i.e., you pay more the more you dispose). The two main PAYT rate structures are three or more different cart sizes with varying rates and pay-by-the-bag systems.

### More Efficient Collection System

Although efficiency improvements do not directly increase diversion, there are significant opportunities in the long term to make the county-wide collection system more efficient and less costly to customers—and to apply the cost savings to expanding curbside recycling service.

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Over the long term, this Study contemplates an eventual move towards exclusively provided collection in the unincorporated areas of Jefferson County. The County would need to address many important details with the local hauling community regarding the number and mix of suburban and rural districts, length of the transition time to avoid stranded collection infrastructure, and other key considerations to address hauler concerns. This Study concludes that exclusively provided collection results in more efficient routing, which in turn would reduce the cost of the existing level of service compared to the current open system.

For example, based on the research performed in Volume 2 (*Collection System Assessment*), the average household in unincorporated areas currently pays \$18 per month for garbage-only collection in the open market system and might pay only \$11 or \$12 (or less) per month in an exclusive system—a saving of \$6 to \$7 per month.

Unlike garbage collection, recycling service is not currently mandatory in unincorporated areas, so the potential cost impact of converting to exclusive collection combined with the addition of new service-level standards that make recycling service universal is slightly different for recycling collection.

The *Collection System Assessment* found that the average cost for recycling collection in the unincorporated area was \$5 per month in the current open market with optional recycling subscription. In incorporated cities where exclusive, universal recycling collection is already provided, residents pay \$2 per month for every-other-week collection. Therefore, if the unincorporated areas converted to exclusive collection with recycling service bundled with garbage service, residents in these areas who are currently subscribing to recycling collection would stand to save \$3 per month. Residents without recycling collection could receive the service with no increase in their overall collection bill.

It is not possible to calculate the exact savings from converting to exclusive solid waste collection and requiring universal recycling collection because of the wide variety of existing services and rates. However, both cost savings and increased diversion can be achieved for many, if not all, residents in unincorporated areas if the County (a) requires that recycling service be bundled with garbage service as the minimum standard, and (b) transitions over time to exclusive collection.

As a first step to reducing costs to customers by adopting exclusive collection with competitive bidding in unincorporated areas of Jefferson County, Louisville Metro can:

- **Pilot regional collection.** Pilot testing could take several forms. One option is to pilot test exclusive garbage collection to validate the expected level of cost savings from increased efficiency. A second option is to pilot test universal garbage and recycling collection, incorporating the single-family service-level standards. This second option would improve diversion and expand services while also obtaining competitive pricing.

Currently, unincorporated areas are served by an open collection system, where multiple haulers overlap in the same geographic area. Residents in unincorporated areas pay in the range of \$25 to \$40 per

## 4. RECOMMENDATIONS

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month for weekly garbage, recycling, and yard waste collection service within the current subscription fee structure, compared to \$12 to \$15 per month in Louisville and other incorporated cities (most of which have established an exclusive collection system for residents).

Strictly from an operational standpoint, a well-managed, competitively bid exclusive (i.e., single provider) collection program will be less expensive than an equally well-managed open collection system. Single-provider systems are more efficient because they coordinate delivery of standardized collection services for all customers within a defined service area, which enables the most efficient routing, which in turn lowers costs.

Strategies for implementing exclusive collection include:

- Contracts between a municipality and a single waste hauler.
- Franchises that grant a single hauler the right to serve a geographic area, with governmental oversight and competitive procurement.
- Municipal collection provided by the local jurisdiction.

It will be critical to involve all existing stakeholders when attempting this type of transition. Contracts or franchises can be designed with input from the hauling community to minimize impacts for existing service providers, although some industry reduction or consolidation will occur naturally as the system becomes more efficient. However, while this solution may reduce the size of, and therefore the employment level and gross revenue generated by these local solid waste companies, the result is less expensive services for every household and other businesses in addition to reductions in air emissions, road surface wear and tear, and heavy truck traffic. Further, haulers may recoup some of this business through the increased requirements for recycling services.