



SOLID WASTE MASTER PLAN: *Achieving Zero Waste*

EXECUTIVE SUMMARY

August 2019



METROPOLITAN NASHVILLE AND DAVIDSON COUNTY

Metropolitan Nashville and Davidson County
Solid Waste Master Plan: *Achieving Zero Waste*

Acknowledgements

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Metropolitan Government of Nashville and Davidson County Office of the Mayor

Metropolitan Council Public Works Committee

Metro Nashville Public Works

Davidson County Solid Waste Region Board

Solid Waste Master Plan Task Force

Tennessee Department of Environmental and Conservation

Project Team Partners:

Resource Recycling Systems (RRS)
Skumatz Economic Research Associates (SERA)
Wilmot, Inc.
LDA Engineering

Bring Urban Recycling to Nashville Today

Recycling Advocates of Middle Tennessee

Natural Resources Defense Council

Introduction

Purpose of the Solid Waste Master Plan



In June 2017, the Metro Public Works Department and the Davidson County Solid Waste Regional Board began working on a Solid Waste Master Plan that will serve as a roadmap to achieving Zero Waste over the next 30 years. **The primary objective of Zero Waste is to minimize waste generation and maximize the diversion of materials from landfills by implementing sustainable solid waste management practices.** Simply put, Zero

Waste is moving from disposing of waste to managing waste as a resource.

Zero Waste necessitates a change in mindset and philosophy. Only then can the current reliance on landfilling be replaced with resource management practices such as waste minimization, reuse, recycling, composting, digestion, and waste-to-fuels technologies.

As Davidson County advances along the path toward Zero Waste, it will establish a sustainable local market economy that will provide new employment and other benefits for the residents of the County.

The Plan has been developed to provide general direction for achieving diversion goals with the key to success driven by the timely and successful implementation of the strategies. The Plan's strategies are organized into three scenarios—conservative, moderate, and aggressive with implementation to occur in phases over 20-30 years. The aggressive

SOLID WASTE MASTER PLAN PRIORITIES



Reach Zero Waste—defined as 90% diversion from landfill disposal



Increase recycling, food waste reduction and recovery, and composting programs throughout Davidson County



Adopt recycling and recovery programs targeted toward Nashville's growing construction and demolition waste stream



Strengthen public education and outreach programs



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scenario includes all the strategies required to achieve 90% diversion while the moderate and conservative scenarios omit specific programs that are considered more difficult to implement but still allow for modest improvement in diversion.

Because buy-in from a diverse group of stakeholders and building momentum for the plan is vital in the beginning, the Plan allows for flexibility in the implementation schedule. Implementation of the Plan can be adjusted to account for changing priorities, funding, or preferences. Recognizing the potential for change, the Plan includes an extended schedule that allows more time in the early years for establishing policies, authority, and funding to support the Plan strategies.



THE MASTER PLAN

- ✓ *Evaluates the deficiencies and successes of the existing waste management system*
- ✓ *Analyzes the financial, environmental, and social impacts (Triple Bottom Line) of existing and proposed strategies*
- ✓ *Develops diversion goals that meet or exceed the State of Tennessee 2025 Material Management Plan*
- ✓ *Recommends strategies that have been proven to be effective in existing zero waste communities*
- ✓ *Provides the framework for measuring progress towards meeting the Zero Waste goal.*



Understanding the Solid Waste Master Plan

Municipal Solid Waste (MSW) includes discarded materials generated by residences, businesses, institutions, and manufacturing. MSW consists of: paper, plastics, glass, metals, yard waste, food scraps, textiles, electronics, appliances (white goods), and household hazardous wastes (HHW).

Solid Waste Management Services Today

Davidson County has a two-tiered service system composed of the Urban Services District (USD) and General Services District (GSD). In the USD, Metro Public Works (MPW) provides waste collection to single family residences, multifamily residences, Metro-owned buildings, public housing, and parts of the central business district (CBD). Recycling collection is also provided to single family residences, Metro-owned buildings and Metro waste customers in the CBD. MPW residential waste collection is provided weekly and recycling collection is monthly. Construction and demolition (C&D) waste collection is provided exclusively by private waste haulers.

In 2010, the Solid Waste Code, which hadn't seen significant change since the early 1960's, was updated to emphasize landfill diversion, waste reduction, and improved access to recycling services throughout the county. As set forth in the revised code, bans were established for yard waste, electronics, cardboard, and C&D waste (residents only). Trash carts were limited to a maximum of two carts per address to encourage recycling and private waste haulers were required to offer recycling services.

Despite these improvements landfill diversion rates in Davidson County have remained low—out of the 1.5 million tons of waste generated in 2016, less than 25 percent was recycled or composted. In researching the causes of the low diversion rate the following were determined to be the most pressing challenges:

- 80% of all collection services are provided by private waste haulers
 - Private waste haulers have no incentive to encourage diversion
 - MPW lacks the authority to monitor or control private waste hauler services
- Funding for solid waste education and compliance is inadequate for promoting recycling and enforcing landfill bans
- Recycling of MSW and C&D waste is not mandatory
- Current options to landfilling food waste are limited



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25%
Waste Generated

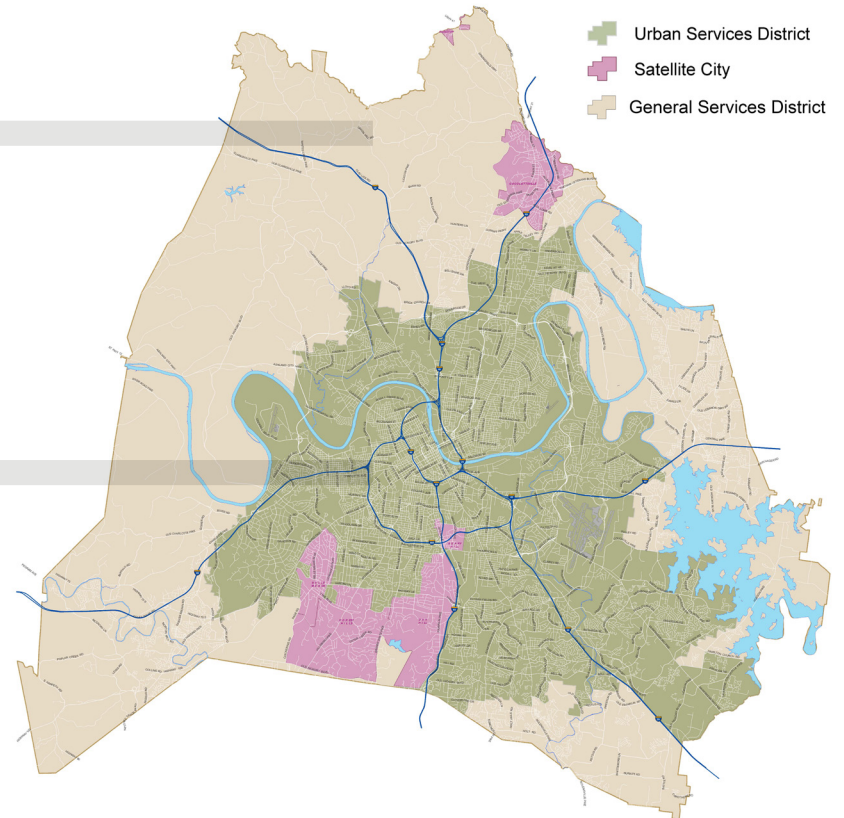
GENERAL SERVICES DISTRICT

195,000 residents
Suburban and rural; lower tax rate

75%
Waste Generated

URBAN SERVICES DISTRICT

496,000 residents
Higher tax rate; more municipal services, including trash & recycling

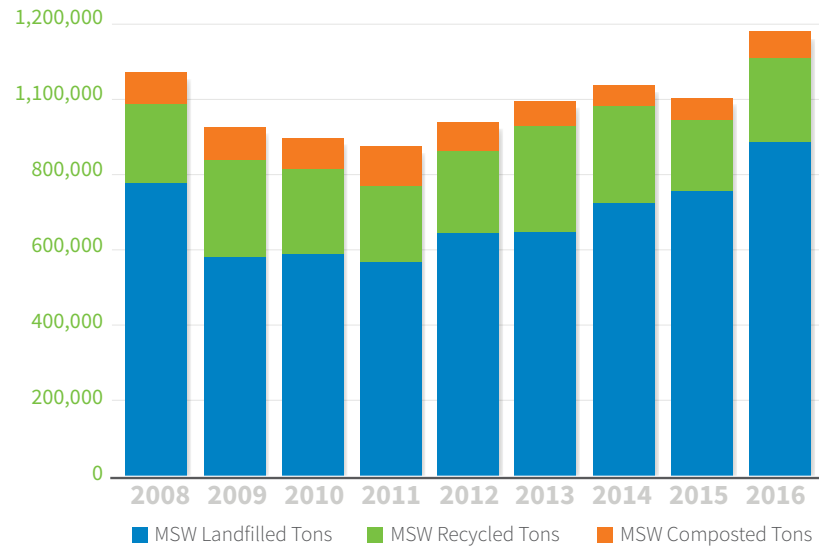


Understanding the Solid Waste Master Plan

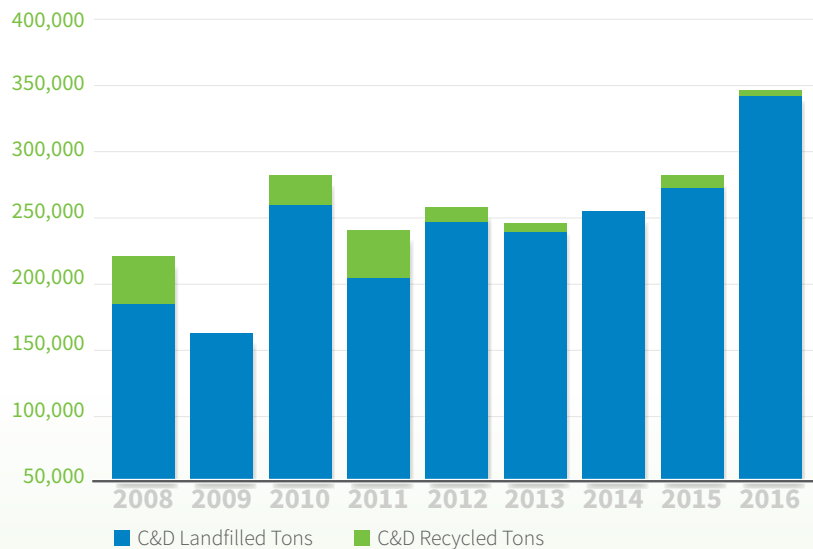
ZERO WASTE is the conservation of resources by means of responsible production, consumption, reuse and recovery of products, packaging and materials.

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MSW Waste Landfilled, Recycled, & Composted



C&D Waste Landfilled & Recycled



2016 Waste Management Breakdown

82%

Landfilled



12%

Recycled



6%

Composted



Waste Generated by Sector



33%

Residential

67%

Commercial

23%

of Total Waste Stream

AMOUNT OF
**CONSTRUCTION &
 DEMOLITION**
 WASTE IN 2016



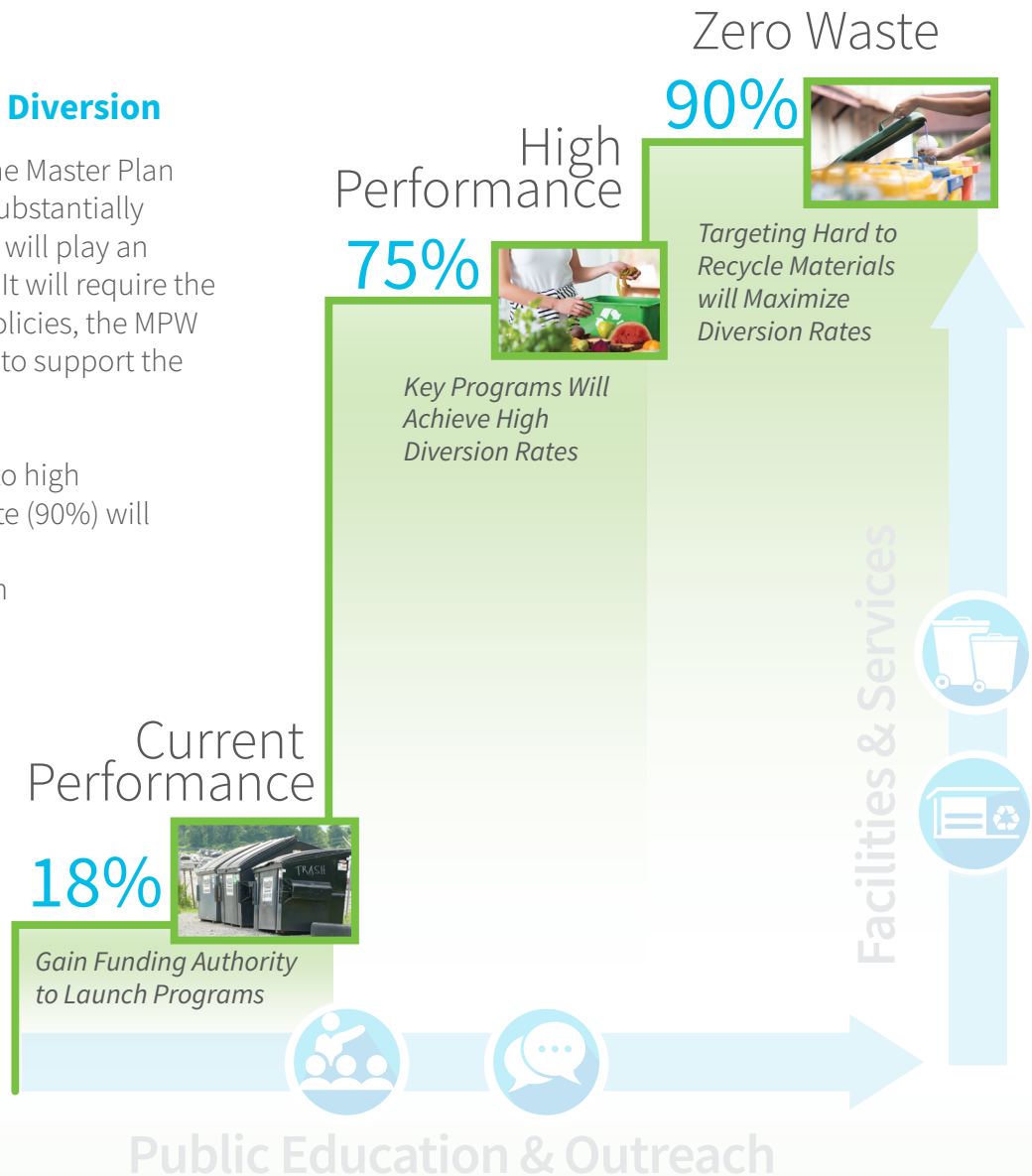
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How to Get to Zero Waste

Creating a Roadway to Waste Reduction and Diversion

Zero Waste cannot be achieved with a single strategy. The Master Plan outlines the various policies and programs required to substantially increase waste reduction and diversion. All stakeholders will play an important role in achieving the goals of the Master Plan. It will require the collaboration of the elected officials to enact effective policies, the MPW to implement zero waste strategies, and the community to support the policies and participate in the new programs.

Increasing waste diversion from its current level of 18% to high performance (75%) and ultimately to reaching Zero Waste (90%) will take time and careful planning. A three-phase approach has been developed for the 30-year planning period with diversion goals for each phase.



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Engaging the Community

As part of the planning process, Metro assembled a task force of various agencies, organizations, educational institutions, and individuals to provide input in each phase of the process and ensure Metro develops a community-driven, implementable plan. Meetings were conducted with the Solid Waste Region Board, Solid Waste Master Plan Task Force, Metro Council Public Works Committee, local environmental groups, and the Tennessee Department of Environment and Conservation.

In addition, six public meetings were conducted throughout the Metro service area and an online survey was performed to provide stakeholders unable to attend a public meeting a convenient way of participating in the outreach activities. Stakeholder engagement and public outreach were important components of the Master Plan's development and will be critical to the implementation of strategies to reach Zero Waste. **Outreach efforts provided a method to garner stakeholders' opinions and thoughts about aspects of the Master Plan, develop innovative ideas, and identify issues and challenges.** Stakeholders provided input on the programs and services needed to increase landfill diversion through recycling, composting, recovery, and reuse programs.

Master Plan Public Meetings



Understanding the Solid Waste Master Plan

During preparation of the Plan, workshops were held with a **Solid Waste Task Force** consisting of representatives from local businesses, restaurants, environmental groups, builders, and state regulators.

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Resident and Business Online Solid Waste Survey

The survey results provided valuable insights for preparation of the plan.



Section 4 of the Master Plan provides details on the results of the public engagement efforts.

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Key Policy and Program Recommendations



Understanding the Solid Waste Master Plan

WASTE DIVERSION minimizes solid waste generation through source reduction, recycling, reuse, or composting. Waste diversion reduces disposal costs and the burden on landfills.

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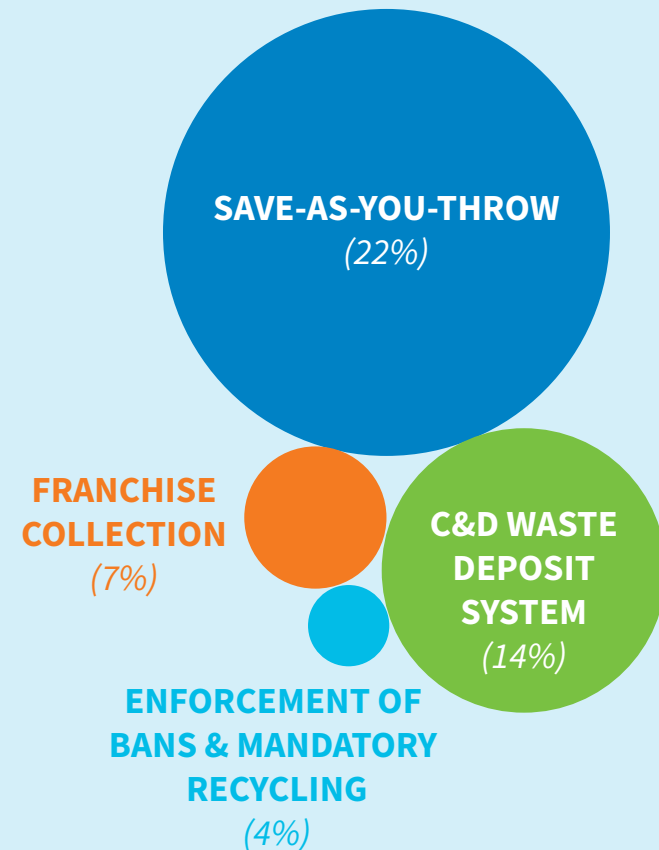


The first step in bringing about change is to establish a set of policies that will become the foundation of Metro's solid waste management program. These changes will not be easy because they require fundamental change to the way waste is currently managed. However, without them, Davidson County can expect only minor improvements to the existing 18% diversion rate. Policies commonly adopted by Zero Waste model cities were evaluated and screened to identify the most critical elements for developing a successful high diversion program. Once the foundational policies are in place, Metro will be in position to implement strategies that build on the success of the existing recycling program and raise the public's expectations for diversion.

Perhaps the most essential policy is the formation of a **Solid Waste Authority** that is inclusive of the USD, GSD, and satellite cities and has the authority to assess household and business solid waste fees across all of Davidson County. An authority will provide the governance structure needed to develop, implement and oversee the new programs.



Access and price incentives provide a strong motivation for diversion; however these types of strategies usually plateau at diversion levels of 40-50%. Mandates and bans are needed to move toward 75% diversion as they provide the motivation that drives increased participation. Fortunately, Metro already has some bans in place. The most important modification is introduction of a **food scraps ban** as this material represents the largest single item remaining in the waste stream. The second modification is to make **recycling mandatory countywide**. Recycling should be made mandatory for both residential and commercial sectors and recycling should be required at all construction sites with specifications stating responsibilities, enforcement, and escalating penalties.



***Diversion in Davidson County
can reach 65% by
implementing the top four
recommended program
strategies plus existing
18% diversion.***

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The most impactful strategy recommended in the master plan is a **Save-As-You-Throw (SAYT)** collection service that provides recycling and food scraps collection service to all residences and businesses in the County. Each household and business receives a large bin for recycling, a large bin for diverting yard waste and food scraps, and a bin for trash, with the size of trash bin selected by each household/business. Smaller trash bins cost less than larger bins. The pricing differential for the trash bins will be set to encourage waste reduction, recycling, and diversion of food scraps.

The goal of this strategy is to increase diversion through increased access and economic incentive. The largest barrier to diversion is that trash plus recycling and food scraps collection costs more than trash alone under the existing program. This strategy reverses the economics by embedding the costs of recycling and food scraps collection within the trash collection fee. In a SAYT program customers save money by diverting more materials and using a smaller trash bin.



The very high tonnages of C&D waste generated by the explosive growth of the Nashville area warrants special attention in the diversion plan. The most effective C&D waste diversion programs in place nationally use a **C&D waste recycling deposit program**. Developers filing for a construction or demolition permit are required to leave a financial deposit that is reclaimed only when they provide documentation at the end of the project that they recycled or reused a threshold amount of the material generated on-site. Many communities require 50% diversion. Diverting that much C&D material from existing landfills will spur development of new C&D waste processing facilities—reversing the recent trend of



declining C&D waste processing capacity in the area. A landfill ban for select components of C&D waste would further support the deposit system.



Replacing the current direct-subscription collection services for non-MPW customers with **franchised collection** would provide significant opportunities for increasing diversion as well as provided other social benefits. This strategy eliminates the routing of multiple haulers operating on the same streets, reducing noise and emissions and improving pedestrian and biker safety. Additionally, a countywide collection program under the control of a solid waste authority would streamline outreach, improve quality of service and benefit from greater economies of scale.

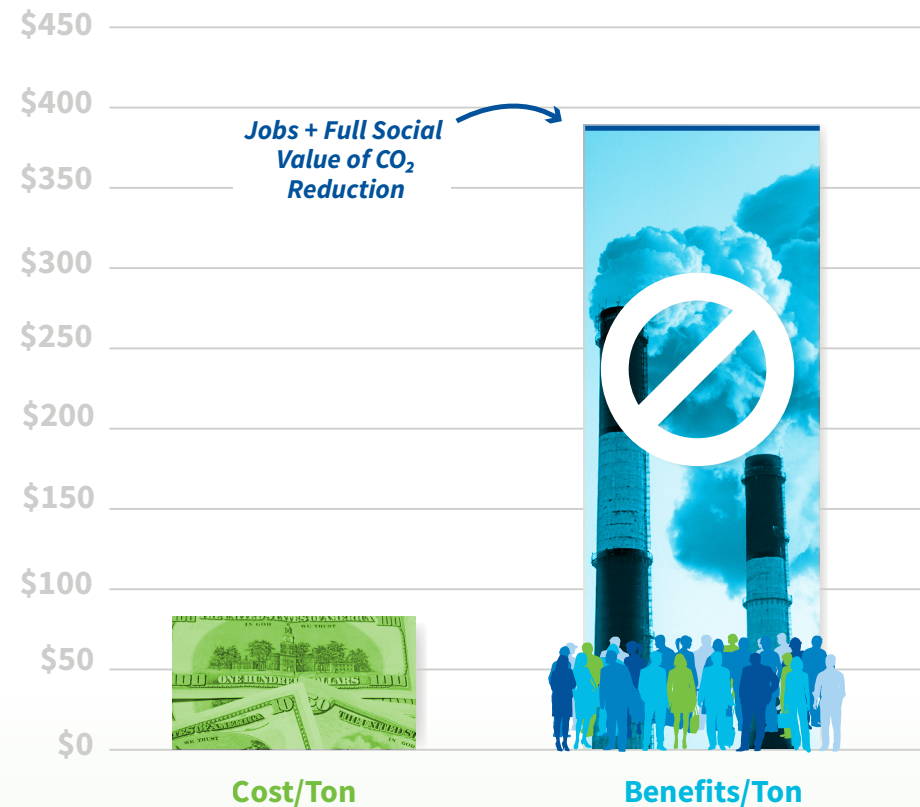
Optimization of collection frequency for incentivizing recycling and organics collection would be another benefit of this strategy. It has been demonstrated in other cities that if trash collection is provided less frequently than recycling and organics collection, the diversion rates will increase substantially.

Section 6 provides details on all of the proposed strategies in the master plan.

Triple Bottom Line

Environmental and social benefits are often overlooked when considering advancements to waste management programs. Implementation of the Solid Waste Master Plan will provide multiple benefits to the region. Moving towards diversion will attract sustainable businesses to the area. Additionally, food waste diversion will help address Metro's meal gap through the enhancement of local donations of fresh foods.

The Master Plan accounts for these benefits through a Triple Bottom Line (TBL)—Economic, Environmental, and Social—analysis which accounts for broader environmental and societal effects. **The TBL analysis of the aggressive portfolio of programs shows the benefits of implementing the new programs exceeds the costs.**



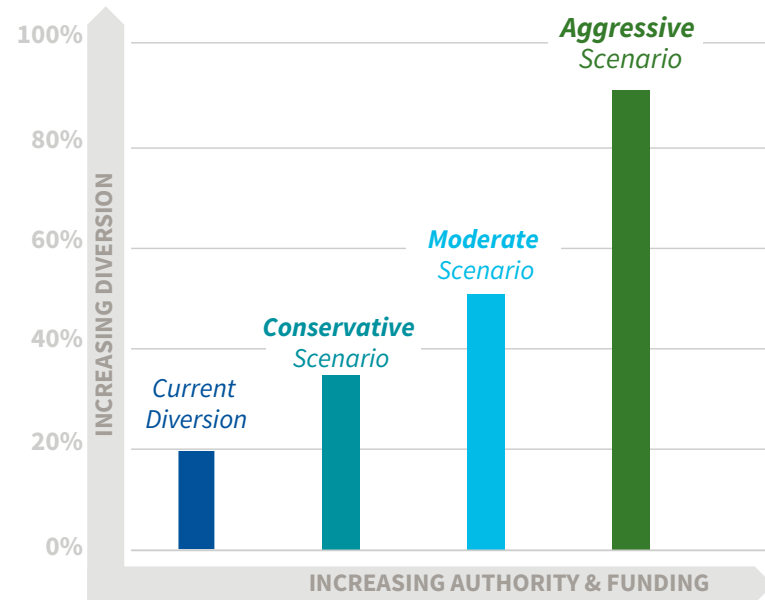
Funding Approach

Arguably the biggest challenge of the Master Plan is determining how to fund new programs that serve both the USD and GSD. Funding of the Master Plan across the entire county is currently hindered by the varying tax rates of the USD and GSD and the exclusion of collection services in the GSD tax rate. Under the current scenario MPW is unable to generate sufficient revenues to support a high diversion plan.

Another challenge of the solid waste program is its reliance on General Fund revenues. With public service priorities for General Fund revenues shifting from year to year, MPW lacks a consistent funding source for planning diversion programs.

MPW solid waste funding is further stressed by its commitment to serving the downtown business area where the increasingly high quantities of generated waste far exceed the requirements in the Code and are a strain on funding.

The proposed solution to these challenges is the creation of a solid waste authority. Establishment of an authority provides the opportunity to address funding (through residential and commercial fees) free of the limitations associated with the current tax structure. The ability of an authority to collect adequate fees is paramount to establishing a long-term, sustainable source of funding that would allow the program to move forward.



An authority would administer solid waste management services as a utility similar to how water services are provided by Metro Water Services; and would serve as the lead entity responsible for implementation of the Master Plan including policies, programs, services and funding. The authority could eventually expand into a regional authority that would take advantage of processing infrastructure in adjoining counties resulting in potential savings.

Reliance upon General Fund revenues to support the Master Plan's programs is one of the biggest challenges to successful implementation.

One Metro, One Plan

Metro has demonstrated its commitment to taking progressive actions and embracing change beginning with the installation of a new form of government in 1963 and continuing with more recent aggressive investments in infrastructure improvements to attract professional sports teams and cultural venues. These changes have resulted in substantial growth in the Metro area.

The continued growth of Davidson County and the Middle Tennessee region means waste management at both the local and regional levels must be viewed as a priority by all stakeholders—residents, businesses, and elected officials. Addressing the waste management needs becomes a focal point that will impact the quality of life that Metro residents enjoy.

One Metro, One Plan is the theme of the Solid Waste Master Plan. It succinctly captures Metro’s intention to unify service delivery and program implementation across Davidson County. It reiterates Metro’s commitment to increase waste reduction, diversion and recycling and move the area to achieving Zero Waste. This Solid Waste Master Plan is similar in nature to the progressive character by which Nashvillians have approached prior transformative plans and decisions that have, and will, continue to benefit residents for generations to come.



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PHASE 1 (Yrs 1-4)

\$360,000 HP1 Planning & Funding Authority, and Tracking System
\$24,120,000 HP2 Residential Save-As-You-Throw Collection
\$310,000 HP5 Education
\$20,000 HP6 Code Support for Compost from Yard Waste & Food Scraps
\$510,000 HP7 Enhanced Public Space Recycling
\$2,990,000 HP8 C&D Waste Recycling Containers and Public Bid Recycle Mandates
\$28,310,000 *Total Phase 1 Annual Cost*

PHASE 2 (Yrs 3-6)

\$880,000 HP4 Enforcement of MSW Mandates and Bans
\$1,380,000 HP9 Improved Access to Convenience Sites
\$2,260,000 *Total Phase 2 Annual Cost*

PHASE 3 (Yrs 6-9)

Savings! **\$8,720,000** HP11 Contracted Franchise Zone Collection for Residential Sector with EOW trash collection
\$30,000 HP12 Adding New Materials to Curbside Recycling
\$20,000 HP13 Incentive Pricing
\$17,030,000 HP3 Commercial Save-As-You-Throw Collection
\$10,000 HP14 C&D Waste Recycling Deposit System
\$8,370,000 *Total Phase 3 Annual Cost*

PHASE 4 (Yrs 9-20)

\$17,200,000 HP10 Multifamily Strategies
\$240,000 HP15 Contracted Franchise Zone Collection for Commercial Sector
\$17,440,000 *Total Phase 4 Annual Cost*

PLAN IMPLEMENTATION

The Plan has been developed to allow Metro to adjust strategy and project implementation through the planning period in response to changes in available revenue and funding, population, environment, technology, and regulatory pressure. The schedule considers that a great deal of flexibility exists within the Plan, so that Metro can adjust the schedule based on changing priorities, preferences, funding, or immediate needs. The Plan must be flexible and modifiable to address the potential for unknown setbacks and delays. Ultimately, the Plan provides general direction with the key to success driven by the timely and successful implementation of the strategies.

Based on Metro’s solid waste goals and the Plan’s recommended strategies and options, the schedule must balance an aggressive timeline with realistic expectations. The overarching implementation plan is to develop and execute both strategy portfolios (aggressive and extended) on parallel tracks. The Plan indicates the primary high-performance and zero waste strategies needed to reach 90% diversion will be implemented in four phases over 20 years. Each phase is designed to build upon the previous one.

EXTENDED IMPLEMENTATION SCHEDULE

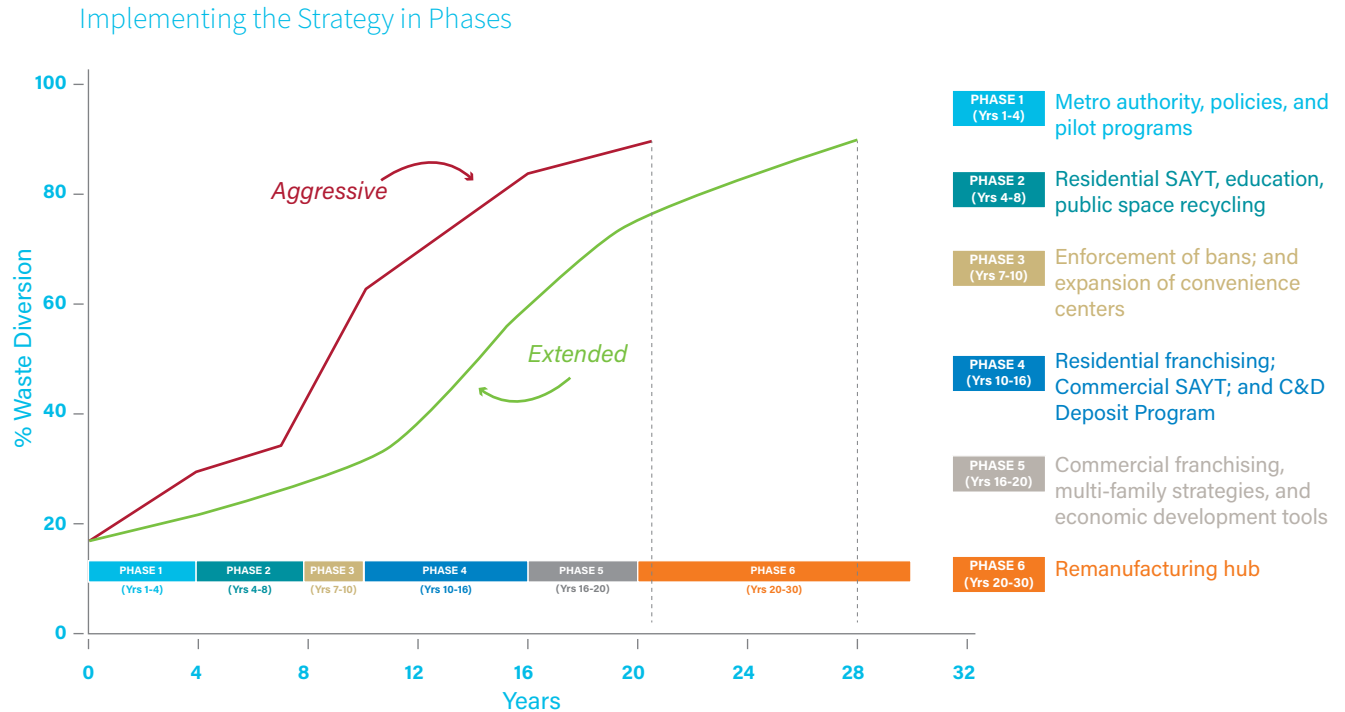
The phases will help guide Public Works and Metro Nashville toward successful diversion; however, implementing the strategies, policies, and projects will vary over the time period. The table to the right compares the aggressive and extended schedules regarding the implementation of key diversion strategies. The primary difference between the aggressive and extended schedules is that the extended Phase 1 activities focus solely on developing and implementing Metro authority, policies, and pilot programs; delaying rollout of the key diversion programs. Even with the technical, financial, and environmental components considered in developing the Plan, success will depend on the early adoption of the policy, authority, and funding requirements that are the key diversion strategies’ foundation.

Comparison of Aggressive and Extended Schedules

KEY DIVERSION STRATEGIES	AGGRESSIVE SCHEDULE (20 YEARS)	EXTENDED SCHEDULE (30 YEARS)
Metro authority, funding and policies	Phase 1	Phase 1
Residential SAYT	Phase 1	Phase 2
Public Space Recycling	Phase 1	Phase 2
Enforcement of bans and mandates	Phase 2	Phase 3
Expansion of convenience centers	Phase 2	Phase 3
Residential franchising; commercial SAYT; and C&D deposit program	Phase 3	Phase 4
Commercial franchising and multi-family strategies	Phase 4	Phase 5
Re-manufacturing hub	Phase 5	Phase 6

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The figure to the right depicts the two proposed implementation schedules: aggressive and extended. The aggressive scenario strategies were developed with the idea that full implementation of the anticipated diversion benefits will take 20-30 years. The extended schedule's 30-year timeline is more pragmatic given the significant change to the waste management system the Plan requires. The anticipated diversion is more gradual under the 30-year timeline and reflects the challenges associated with establishing sustainable funding, gaining proper authority and control over the waste stream, and achieving the required changes in the waste management behaviors of residents and businesses.



CURRENT PROGRESS TOWARDS HIGHER DIVERSION

Because change is required throughout the County, the successful, long-term implementation of the program needs to allow for consistent delivery of services. The current steps being implemented by Metro Public Works combined with Phase 1 activities will provide a significant start toward increased waste reduction, diversion, and recycling; and form the building blocks for growing new strategies and programs to drive increased diversion towards a Zero Waste Nashville.

Section 13 provides a detailed discussion on Plan Implementation.

