

Solid Waste Master Plan Update

Nashville and Davidson County

CLEAR GLASS
CLEAR GLASS

BROWN GLASS
BROWN GLASS

GREEN GLASS
GREEN GLASS



December 6, 2017

**CDM
Smith**

Presentation Outline



- Metro Public Works Updates
- Waste & Recycling Characterization
- Public Engagement
- Residential Online Survey Results
- Summary of Research Recommendations
- Solid Waste Funds

Metro Public Works Updates



- Organics
 - Natural Resource Defense Council research
 - Food Waste drop-off sites for residents
 - Mayor's Food Waste Challenge & Kroger
 - Food waste collection contract for Metro buildings
 - School food waste pilots
 - TDEC Organics Management Grant

Metro Public Works Updates



- Glass
 - Honky Tonk Glass Bottle Recycling
- Education
 - Refocus from “Recycling” to “Reduce, Reuse, Recycle”
- Regional Efforts
 - TDEC and Greater Nashville Regional Council

Public Engagement



- Interviews with key environmental groups
 - BURNT/SOCM
 - RAM
 - Tennessee Environmental Council
- Conduct an online survey of Nashville residents and businesses
- Meetings with TDEC and waste management staff of surrounding counties
- Gathering input from Metro Public Works Committee members



Statistical Survey – Services, Satisfaction, Support



- Statistical web survey of random set of:
 - Residences - Single family (SF) and Multifamily (MF) (200+ responses)
 - Commercial businesses. Business survey still on-going; some additional residential surveys to be completed.
- Preliminary responses to key topics
 - Green generally top 2 responses; red are biggest barriers or opposition or not sure.
 - On support for strategies, the most important responses -- “support” (strong and moderate) vs. “strongly oppose”.

Statistical Survey – Services, Satisfaction, Support



How often is your service collection for...	Trash				Recycling			
	All SF	All MF	SF- USD	SF- GSD	SF all	MF all	SF -USD	SF-GSD
Every Week	86%	88%	90%	85%	21%	53%	13%	35%
Every Other Week	3%	2%	9%	6%	17%	7%	11%	27%
About once a month	2%	0%	2%	3%	59%	27%	76%	35%
N/A Self-haul or other	9%	4%	0%	4%	3%	13%	0%	4%

Summary: Trash reportedly collected Weekly; recyclables collected Weekly or monthly.

The majority of residents

- Have their trash containers provided for them free of charge
- Only use 1 cart for trash
- Have the same hauler/ service provider for trash and recycling
- Use 96g carts for recycling
- Have recycling containers provided for free (but 23% of SF-GSD say they have to pay)
- Have single stream recycling

Statistical Survey – Services, Satisfaction, Support



Which materials do you recycle or compost regularly?

	All SF	All MF	SF-USD	SF-GSD
Glass bottles	33%	40%	31%	37%
Plastic bottles	72%	73%	78%	74%
Aluminum cans	72%	40%	80%	67%
Tin/steel cans	39%	20%	42%	41%
Milk cartons	37%	20%	38%	41%
Newspaper	62%	33%	67%	59%
Cardboard	86%	60%	93%	81%
Cereal boxes	61%	33%	62%	59%
Other paper	55%	40%	58%	56%
Yard/green waste	7%	7%	7%	7%
Food Scraps	7%	0%	9%	4%
Household hazardous waste	4%	0%	2%	4%
Electronics	8%	7%	2%	19%
None, don't recycle	1%	7%	0%	0%

Summary: There is high recycling of cardboard, bottles, and cans, and various paper grades. There is little organics diversion, glass recycling, or cartons.

Statistical Survey – Services, Satisfaction, Support



Summary: Most food goes into the trash.

What do you do with most of your FOOD WASTE?

- Put in garbage disposal
- Curbside service takes food scraps
- Put in trash
- Home compost bin
- Drop off at East and Omohundro Convenience Centers
- Feed to the dog/pet

All SF	All MF	SF-USD	SF-GSD
33%	29%	31%	35%
5%	3%	2%	6%
67%	78%	76%	62%
9%	3%	10%	9%
1%	1%	2%	1%
10%	5%	7%	12%

Statistical Survey – Services, Satisfaction, Support



Support for Program Changes

- Add curbside glass collection
- Add weekly food-waste & yard waste programs
- Backyard composting training & discounted backyard compost bins
- Encourage more recycling by builders and re-modelers
- Increase curbside recycling from monthly to every-other-week
- Metro's goal for Zero Waste to Landfills
- Programs and incentives to encourage more recycling by businesses

Somewhat & Strongly Support				Strongly Oppose			
All SF	All MF	SF-USD	SF-GSD	SF all	MF all	SF - USD	SF - GSD
69%	57%	76%	63%	1%	1%	0%	1%
61%	51%	70%	52%	2%	1%	0%	4%
63%	52%	71%	56%	2%	0%	2%	3%
76%	68%	81%	70%	1%	1%	0%	1%
65%	58%	74%	56%	2%	1%	0%	3%
71%	64%	79%	62%	1%	0%	2%	1%
76%	61%	84%	68%	1%	3%	0%	1%

*USD –trash service from Metro/ GSD- non Metro trash service

Summary: There is strong support for, and minimal objections to, a variety of service refinements.

Statistical Survey – Services, Satisfaction, Support



Support IF trash service not in taxes (or if pay for service)

- Require haulers include curbside recycling in trash rates
- One Hauler- Metro uses bid process to select 1 hauler
- Require haulers include curbside yard-waste in trash rates
- Save-As-You-Throw (pay less for smaller cans, incl. recycling)
- Require trash haulers to offer yard waste service (extra fee)

Somewhat & Strongly Support				Strongly Oppose			
All SF	All MF	SF-USD	SF-GSD	SF all	MF all	SF - USD	SF-GSD
64%	48%	71%	55%	3%	3%	0%	6%
61%	43%	67%	55%	2%	1%	0%	4%
59%	42%	62%	53%	3%	1%	2%	4%
55%	47%	55%	51%	3%	1%	5%	3%
47%	34%	55%	43%	6%	3%	2%	8%

Summary: Strong support for: city-wide mandatory recycling (and yard waste) in trash rates; single hauler, and SAYT programs.

Statistical Survey – Services, Satisfaction, Support



Consider an Advantage IF trash service not in taxes and Metro selected only 1 hauler

- Potential lower curbside service bills (through Metro wide contract)
- Fewer trash trucks on streets (noise, wear & tear)
- More uniform collections (containers types, days set out)
- Customer service (everyone calls same hauler/ number)
- Customer no longer chooses their own hauler
- Some haulers don't win/ might lose customers/ move to commercial service

Advantage				Strong Disadvantage			
All SF	All MF	SF-USD	SF-GSD	SF all	MF all	SF - USD	SF- GSD
74%	55%	77%	71%	4%	4%	2%	6%
56%	53%	56%	51%	6%	8%	4%	9%
57%	55%	58%	53%	4%	5%	4%	5%
52%	38%	50%	51%	3%	5%	2%	4%
33%	20%	32%	32%	7%	11%	4%	9%
26%	18%	23%	30%	11%	7%	7%	16%

The main arguments for single hauler are lower rates and uniform collection.

There are only limited concerns about small haulers and loss of choice of service provider.

Waste & Recycling Characterization Study



- Understanding of the disposal and recycling habits in the Metro Nashville area
- Identify waste materials that will significantly impact landfill diversion
- What materials are contaminating single stream recycling?



Waste & Recycling Characterization Study



- Sampling and Sorting was performed in two seasons:
 - Summer (July) and Fall (October)
 - Peak Tourist Season and Schools are in Session
- Each event lasted 2 weeks (1 week for waste, 1 week for recyclables)
- Study was performed at:
 - Waste Management Antioch Transfer Station
 - Republic Services Transfer Station
 - Waste Management River Hills Materials Recovery Facility



Waste & Recycling Characterization Study



- Set Up



Waste & Recycling Characterization Study



- Identify waste load



Waste & Recycling Characterization Study



- Extract a sample



Waste & Recycling Characterization Study



- Samples are sorted into 50 categories



Waste & Recycling Characterization Study



- Samples are sorted into 50 categories
 - **Paper** – Newsprint, Office Paper, Magazines/Catalogs, Uncoated OCC/Kraft, Boxboard, Mixed Paper

Mixed Paper



OCC

Magazines



Waste & Recycling Characterization Study



- Samples are sorted into 50 categories
 - **Plastics** - #1 Pet Bottles/Jars, #1 Other Pet Containers & Packaging, #2 HDPE Bottles/Jars – Clear, #2 HDPE Bottles/Jars – Color, #2 Other HDPE Containers & Packaging, #6 Expanded Polystyrene Packaging (EPS), #3-#7 Other, Rigid Plastic Products, Grocery & Merchandise Film Bags, Trash Film Bags, Commercial & Industrial Film, Other Film, Composite Plastic

#1 PET



#2 HDPE Clear

Other Film



Waste & Recycling Characterization Study



- Samples are sorted into 50 categories
 - **Glass** - Glass Bottles and Jars clear/brown/green/blue, Flat Glass, Other Glass

Brown Glass Bottles and Jars



Clear Glass Bottles and Jars

Waste & Recycling Characterization Study



- Samples are sorted into 50 categories
 - **Organics** - Yard Waste, Food Scraps, and Compostable Paper



Food Scraps



Compostable Paper



Yard Waste

Waste & Recycling Characterization Study



- Samples are sorted into 50 categories
 - **Metals** - Aluminum Beverage Containers, Other Aluminum, HVACs Ducting, Ferrous Containers (Tin Cans), Other Ferrous, Other Non-Ferrous, Other Metal



Aluminum Cans



**Ferrous Containers
(Tin Cans)**

Waste & Recycling Characterization Study



- Samples are sorted into 50 categories
 - **HHW** - Latex Paint, Oil Paint, Weed and Pest Control, Used Oil/Filters, Other Automotive Fluids, Mercury-Containing Items, Sharps & Infectious Waste
 - **Textiles** – Carpet, Carpet Padding, Clothing, Other Textiles



Sharps



Clothing

Waste & Recycling Characterization Study



- Samples are sorted into 50 categories
 - **C&D** - Clean Lumber, Wood Pallets, Painted Wood, Treated Wood, Concrete, Reinforced Concrete, Asphalt Paving, Rocks, Bricks, Gypsum Board, Asphalt Shingles, Other Roofing, Plastic Materials, Ceramics/Porcelain
 - **Inorganics** – Televisions, Computer Monitors, Computer Equipment, Electronic Equipment, White Goods, Lead-Acid Batteries, Household Batteries, Tires, Household Bulky Items, Fluorescent Lights;

**Clean
Dimensional
Lumber**



**Household
Batteries**



**Electronic
Equipment**



Waste & Recycling Characterization Study



- Categories are weighed and recorded



Waste & Recycling Characterization Study



- Total number of samples: 298
- Total tons sampled: 20+ tons MSW 10+ tons Recovered Materials
- Sector Distribution: 50/50 Res/ICI

MSW Samples by Waste Sector

Sampling Group	Sample Count		Total Sample Wt.
	No.	%	(pounds)
Residential	96	50%	20,586
<i>USD</i>	67	69.8%	13,899
<i>GSD</i>	29	30.2%	6,687
ICI	96	50%	21,551
<i>USD</i>	83	86.5%	18,662
<i>GSD</i>	13	13.5%	2,888
Total Res/ICI	192	100%	42,136

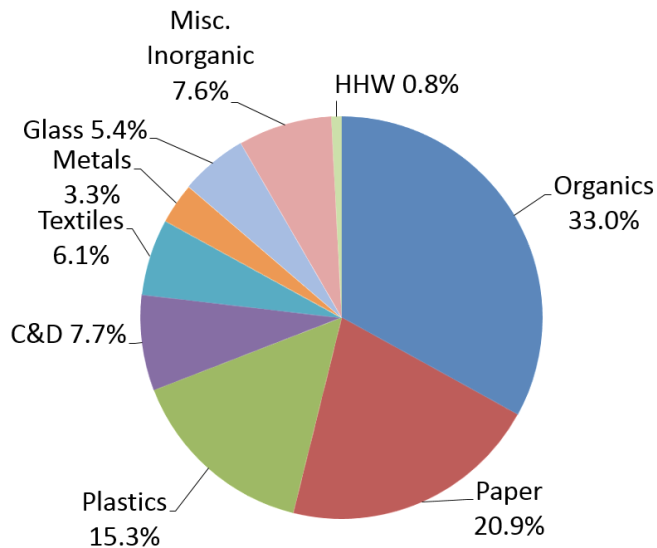
MRF/Recovered Samples by Waste Sector

Sampling Group	Sample Count		Total Sample Wt.
	No.	%	(pounds)
Residential	53	57%	12,245
<i>USD</i>	42	79.2%	9,751
<i>GSD</i>	11	20.8%	2,493
ICI	40	43%	9,630
<i>USD</i>	33	82.5%	7,958
<i>GSD</i>	7	17.5%	1,672
Total Res/ICI	93	100%	21,874

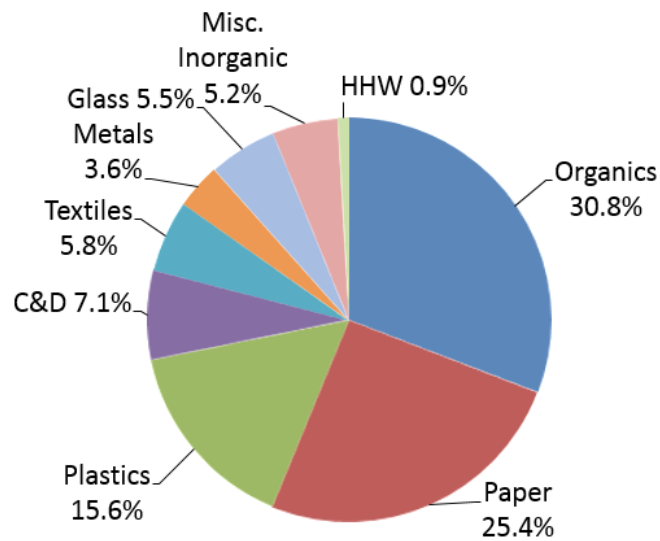
Waste Characterization Study



- Summer vs Fall Results: Residential Landfilled Waste



Summer



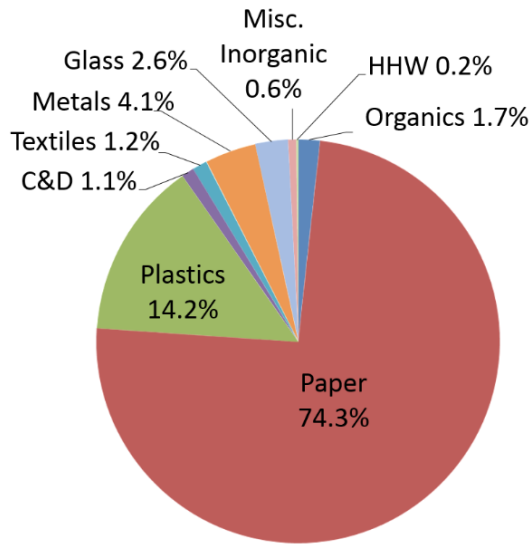
Fall



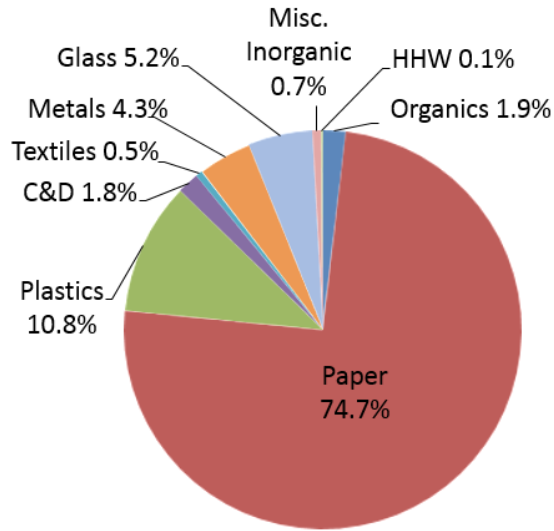
Recycling Characterization Study



- Summer vs Fall Results: Residential Recovered Waste



Summer



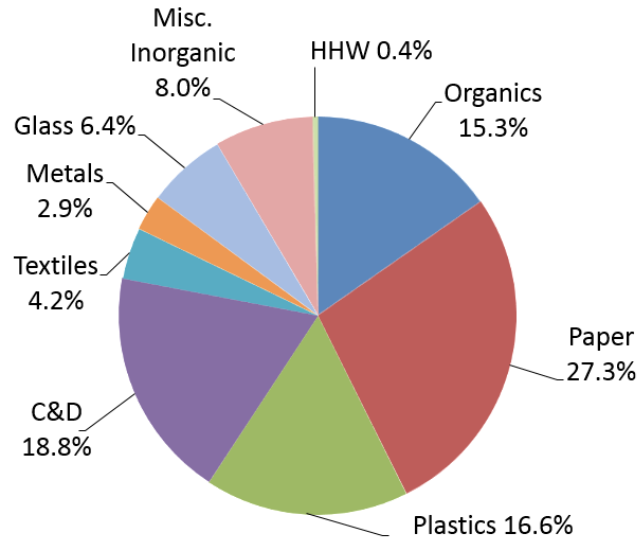
Fall



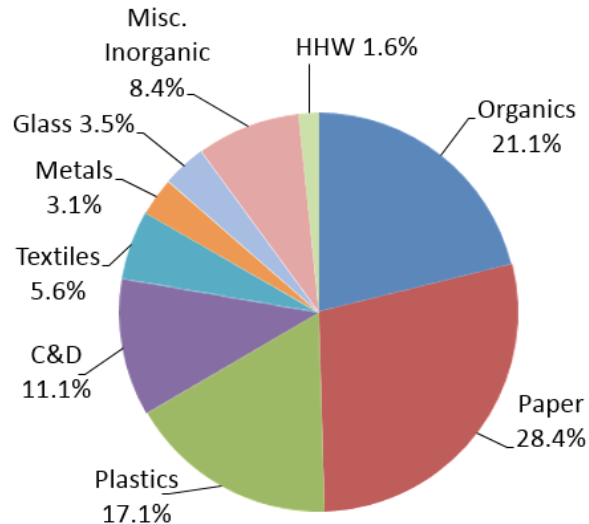
Waste Characterization Study



- Summer vs Fall Results: ICI Landfilled Waste



Summer



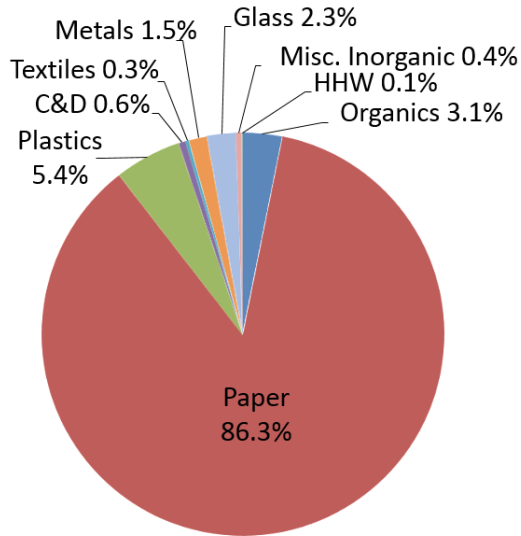
Fall



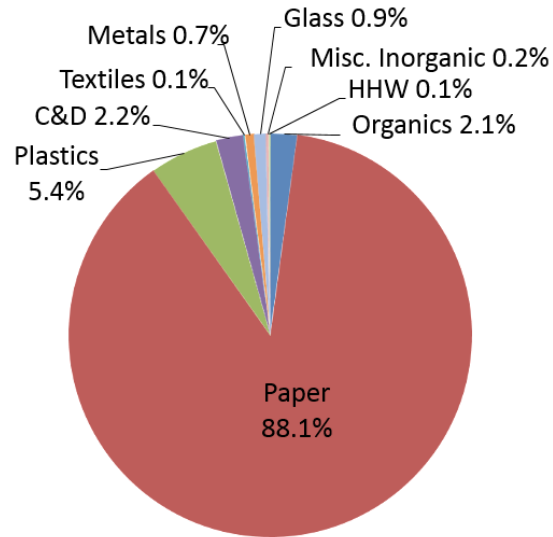
Waste & Recycling Characterization Study



- Summer vs Fall Results: ICI Recyclables



Summer



Fall



Top Ten Components



- Combined Seasons Results
 - Waste has lots of food, compostables, C&D and cardboard
 - Recyclables are largely cardboard and a variety of paper

Top Ten Components, Residential/ICI

Component	Waste Composition %
Food Scraps	15.4%
Construction and Demolition	12.2%
Compostable Paper and 'other'	9.3%
Uncoated OCC	7.9%
Household bulky items,	6.1%
Clothing and other textiles	4.7%
Boxboard	3.2%
Yard Waste - Compostable;	2.6%
Other Film	2.3%
Diapers	2.3%
Total	66.1%

Landfilled Waste

Top Ten Components, RES/ICI

Component	Waste Composition %
Uncoated OCC	37.6%
Magazines/Catalogs	9.7%
Newsprint	8.0%
Boxboard	7.7%
High Grade Office Paper	5.3%
Mixed Paper - Recyclable	5.0%
#1 PET Bottles/Jars	3.0%
Compostable Paper and 'other'	2.8%
Kraft	1.6%
Construction and Demolition	1.5%
Total	82.1%

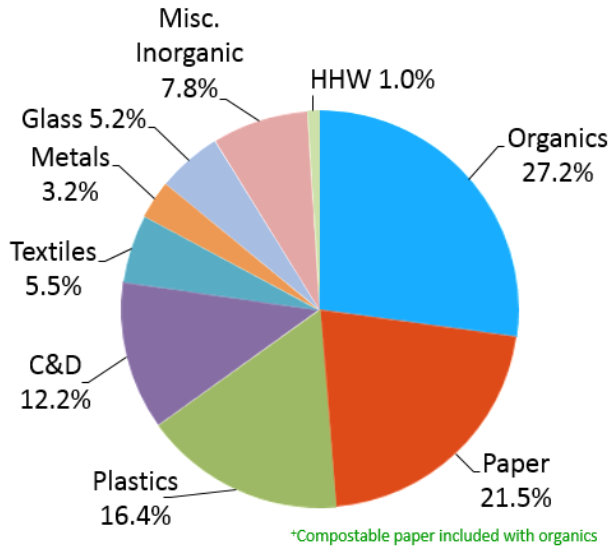
Recovered Waste



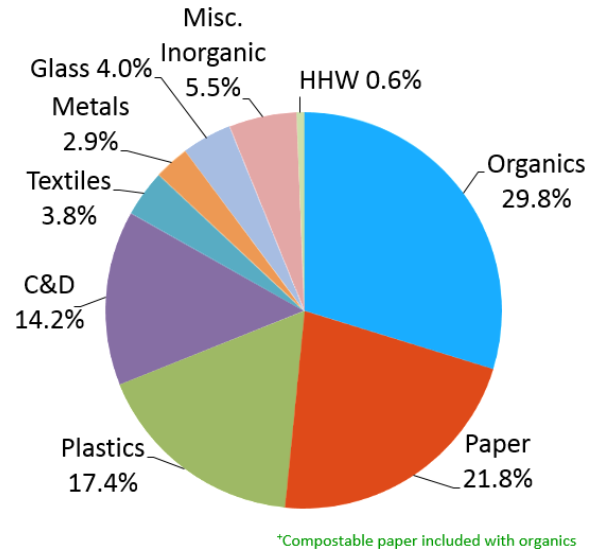
Waste Characterization Study



- Combined Seasons Results for USD and GSD are similar



• USD (Res+ICI)



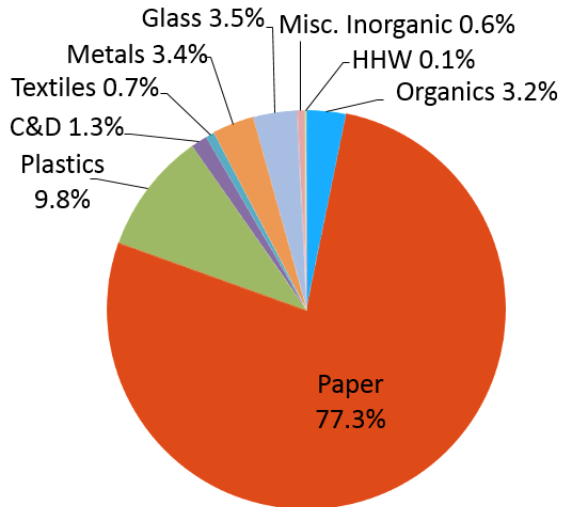
GSD (Res+ICI)



Recycling Characterization Study

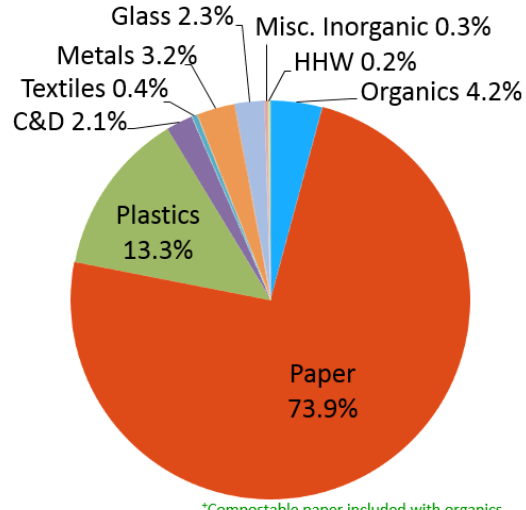


- Combined Seasons Results
 - Cardboard is half of paper
 - Contaminants are 8+%



*Compostable paper included with organics

USD (Res+ICI)



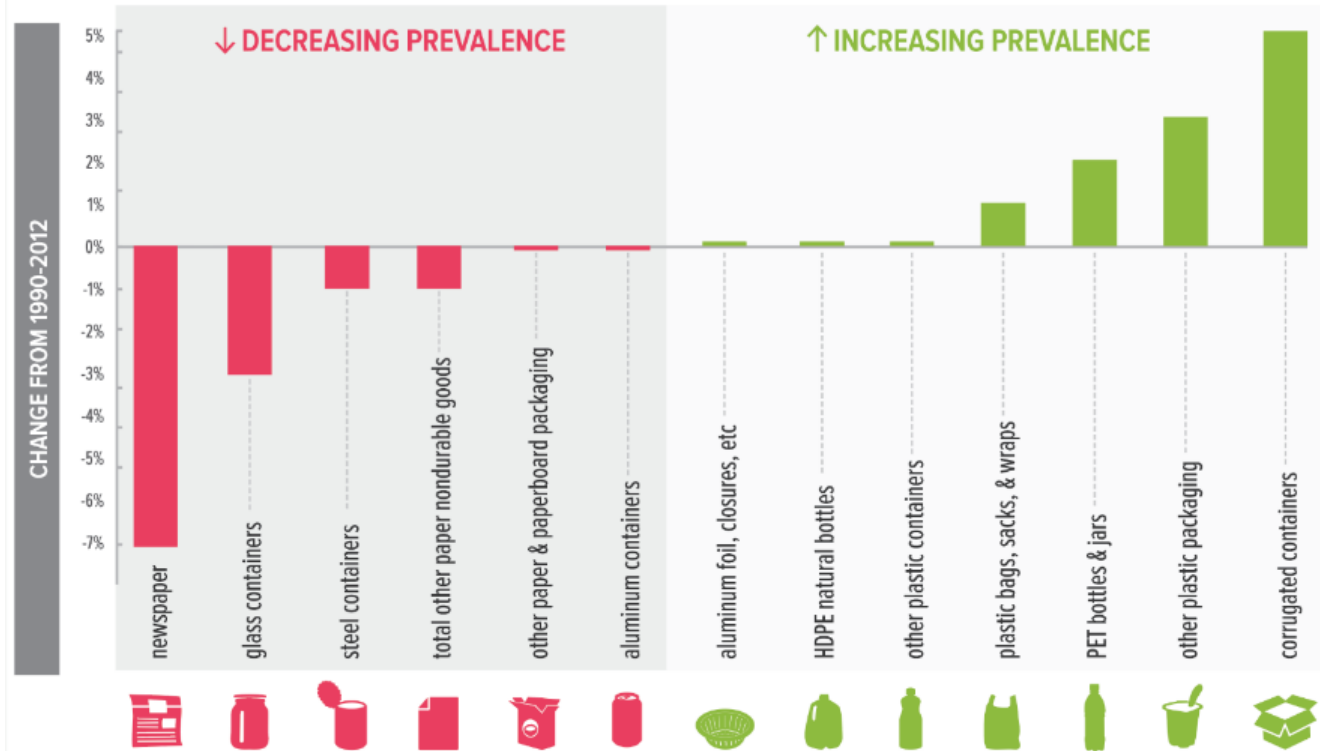
*Compostable paper included with organics

GSD (Res+ICI)



The Recycling Stream is Evolving

1990 to 2014 Trend



Getting To High Performance

75%

HIGH PERFORMANCE

- Getting to 75%
- Funding structure
- Policies
- Commercial

90%

ZERO WASTE

- Zero Waste Options
- Collection and MRFs



FACILITIES

- Organics
- Transfer Stations
- New technologies



Identification of Leading Policies



- Inventory of strategies from leading national and international communities
 - Policies, mandates, incentives, metrics, reporting, etc.
- Multi-step screening process
 - Key criteria for Nashville
 - Pass/fail score;
 - Potential performance scale from very high to very low
- Next step for best options
 - Tonnage estimates, cost, funding analysis, implementation needs

Criteria Used:

- *Diversion*
- *Cost to City*
- *Generator cost*
- *GSD/USD Suitability*
- *Sector suitability*
- *Existing infrastructure*
- *Fundability*
- *Proven*
- *Sustainability*
- *Equity between groups*
- *Target materials*
- *Fatal Flaws*

High Commercial Sector Concepts



Opportunities

- Significant divertible tonnage available
- Opportunity / (need) to manage costs
- Potential inefficiencies
- Set policy
- Improve equity

Challenges

- Mix of services with USD/GSD
- Resistance to change
- Limited experience in this sector
- Business-based barriers
- Funding

- **Highest Scoring Policy Concept(s):**
 - SAYT Area-wide
 - Enforce and Expand Existing Bans
 - Mandatory Recycling
 - Targeted mandatory food scraps

- ABC Law
- Transparent Billing / Bidding Info
- Surcharges / Tax Concessions
- Small Business Strategies
- Downtown Alleys Program

High Single Family Residential Concepts



Opportunities

- Significant divertible tonnage available
- Inefficiencies in collection
- Improve equity, incentives
- Can build on infrastructure, familiarity

Challenges

- Mix of services, funding USD / GSD,
- Resistance to change; motivation / imperfect information
- Service entitlements
- Funding

Highest Scoring Concept(s):

- SAYT Area-wide (best practices)
- Recycling EOW Mandatory / Optimized Collection
- Mandatory organics – phased
- Allow / encourage EOW trash
- Prescriptive approaches / aggressive policies if goals not met in cities
- Convenience system policies

High Multi-Family Sector Concepts



Opportunities

- Significant portion of the residential sector (20% in large buildings; fortunately smaller buildings usually treated similarly to SF)
- Divertible tonnage available

Challenges

- Lack of success elsewhere / lack of known solutions
- Mix of services with USD/GSD,
- Motivations and barriers (split incentive, turnover, space, etc.)
- Funding

Highest Scoring Policy Concept(s):

- Changing codes:
 - Recycling space in new construction / remodel work
 - Change required service computations
- SAYT, recycling embedded (a la commercial SAYT recommendation)
- Require haulers to work with City to run pilots; research other cities; have tried hauler incentives, champions, technology... Focus of longer term

High Public Sector Gov't & Schools Concepts



Opportunities

- Significant divertible tonnage available – higher education schools in Nashville
- Inefficiencies in collection
- Improve equity, incentives
- Training in schools – trains youth
- Walk the Talk for government

Challenges

- Authority to require, enforce
- Public / private
- Economics an issue
- USD/GSD
- Funding

Highest Scoring Concept(s):

- Campuses could be offered elements mentioned elsewhere / business svcs
 - Surcharges / Tax incentives
 - Enforcing bans
 - Technical assistance
- Government procurement, bins, events

High C&D Sector Concepts



Opportunities

- Significant divertible tonnage available; growing, lost opportunity
- Numerous opportunities, materials
- Some high quality / valuable materials

Challenges

- Not primary business focus
- Service entitlements
- Funding
- Facilities

- **Highest Scoring Concept(s):**
 - Deposit /Plan system
 - Require on-site sale before demolition / removal
 - C&D plans covering disposition of materials
 - Green building codes (and/or point system a la LEED) and developer incentives system

Moving on to Zero Waste



75%

HIGH PERFORMANCE

- Getting to 70/75%
- Funding / financial structure
- Policies / mandates
- Commercial

90%

ZERO WASTE

- Zero Waste Options
- Also discuss Collection and advanced recycling



FACILITIES

- Capacity and expansion
- New technologies

Zero Waste Strategies: Building the Base to 75% and going Beyond 75% Diversion



PHASE 1

**Access
to Services**

YEARS 1-5

PHASE 2

**Building
Participation**

YEARS 6-9

PHASE 3

**Recovering
Whatever's Left**

YEARS 10+

Zero Waste Communities strategize deployment of services and policies through phases.

Zero Waste Strategies: Going Beyond 75% Diversion



- Political Leadership
 - Establishment of Zero Waste plan, goals and benchmarks with funding support
- Vision/Mission
 - Practices Highest and Best Use hierarchy
- Policies/Ordinances
 - Construction recycled content ordinance
- Implementation Direction
 - Recycling economic development focus to support local recycling infrastructure

Evaluation of Program Strategies for Zero Waste



- Residential solid waste collection franchise
 - Standard service delivery across all service providers
 - Lower collection and disposal costs from efficiencies and competition for long term contracts
 - Leverage technology
- Recyclable materials processing and marketing
 - MRF for recyclables processing and marketing of curbside and commercial recyclables
 - Process recycled materials to the highest value and share the revenue from end markets (Regional MRF)
- Wet/Dry collection systems (two-can collection system):
 - One can for Organics (wet) including yard trimmings and food waste
 - One can for Recyclables (dry) including current and expanded list of recyclables
 - No trash can

Important Supporting Components of Zero Waste



- Citizen convenience center drop-off recycling
 - Important part of overall system (equity, access)
- Public space recycling
 - Demonstrates consistency in messaging to public / citizens
 - explore new options for Expanded away-from-home recycling
- Public education and outreach
 - High quality education and outreach efforts can boost collection and reduce contamination
 - Focus on motivation and addressing barriers, recycling awareness – Social marketing and targeted market research
 - Strategies to contribute to the sustainability of long term collection programs

Tonnages & Largest Targets - Estimated



Est Tons 2018	USD-LF	USD-Recy	USD-Orgs	GSD-LF	GSD-Recy	GSD-Orgs	Total Gen	Percent of Generation
SF	115,500	11,800	11,400	76,300	4,100	3,600	222,700	14%
MF	14,600	600	-	9,900	300	-	25,400	2%
Com'l	522,100	144,400	34,400	129,800	37,500	9,000	877,200	56%
CBD	7,300	100	-	-	-	-	7,400	0%
ConvenCtr	18,100	8,700	23,900	-	-	-	50,700	3%
Gov't	19,700	300	-	7,300	100	-	27,400	2%
C&D	80,200	2,400	-	255,400	8,400	-	346,400	22%
Total	777,500	168,300	69,700	478,700	50,400	12,600	1,557,200	100%
Percent of Total Gen	50%	11%	4%	31%	3%	1%	100%	

EST 2018 Tonnage – (Baselines) – Some refinements of USD vs. Metro being conducted

Tonnages & Largest Targets Recoverables in Landfill - Estimated



	=	SF	MF	Com'l	Other	Total	Percent
Paper		28,400	36,700	149,400	11,700	226,200	19%
Plastic		19,900	26,700	87,600	8,100	142,300	12%
Glass		6,800	4,800	27,200	1,600	40,400	3%
Bulky		6,600	8,000	35,800	2,200	52,600	4%
Electronics		1,200	1,700	9,200	500	12,600	1%
Metals		4,200	3,700	16,500	1,200	25,600	2%
Organics Non-food		13,900	12,100	28,700	4,100	58,800	5%
Food		25,400	19,500	67,200	6,600	118,700	10%
Textiles		7,600	5,100	27,700	1,600	42,000	4%
C&D*		10,400	25,500	329,400	87,400	452,700	38%
Other		900	500	6,100	300	7,800	1%
Total		125,300	144,300	784,800	125,300	1,179,700	100%
Percent		11%	12%	67%	11%	100%	

*EST 2018 Tonnage – (Baselines) – Some refinements of USD vs. Metro being conducted- * Reconfirming C&D – includes C&D directly LF and C&D in Res and Com'l sorts*

Sample High Performance (HP) Program Package – (Draft)



TABLE 1: Mandates, Com'l, & High Performing Strategies" - Tons & Pct's PRELIMINARY WORKING DRAFT - Conservative Case

Diversion Option / Program - Results from SERA WDAM/ZW Model	All Res	All Com'l	Tons						Total Gen=>	1,557,200	
			USD			GSD			Total USD & GSD Tons Diverted		Pct of Total Generation Diverted
			Res	Com'l	Total	Res	Com'l	Both			
1 Tracking, Goals, Measurement PRR	0	0	0	0	0	0	0	0	0	0.0%	
2 Residential SAYT with 3-Stream and Food Waste Ban (charging methods vary by district)	95,400		59,200		59,200	36,200		36,200	95,400	6.1%	
2b Add EOW Trash (improves FW)	7,600		4,700		4,700	2,900		2,900	7,600	0.5%	
3 Com'l SAYT with Targeted 3-Stream, ABC Law, and Food Waste Ban		214,900		64,500	64,500		150,400	150,400	214,900	13.8%	
4 Enforce Existing Bans					-			-	-	0.0%	
5 C&D Deposit System		226,400		67,900	67,900		158,500	158,500	226,400	14.5%	
6 Convenience Access Mins	9,400		5,800		5,800	3,600		3,600	9,400	0.6%	
7 Incentive Surcharges		48,100		14,400	14,400		33,700	33,700	48,100	3.1%	
8 Contracted Collection					-			-	-	0.0%	
9 Small Business Policies		3,200		1,000	1,000		2,200	2,200	3,200	0.2%	
10 Public Space Recycling					-			-	-	0.0%	
11 Public Education	2,800		1,700		1,700	1,100		1,100	2,800	0.2%	
12 More Aggressive Res Incentives	7,100		4,400		4,400	2,700		2,700	7,100	0.5%	
13 MF Pilots	2,000		1,200		1,200	800		800	2,000	0.1%	
14 Add Glass - Res	4,100		2,500		2,500	1,600		1,600	4,100	0.3%	
15 Add Glass - Com'l		16,300		4,900	4,900		11,400	11,400	16,300	1.0%	
15 Add Textiles-Res	1,500		900		900	600		600	1,500	0.1%	
16 Add Textiles- Com'l		5,500		1,700	1,700		3,900	3,900	5,500	0.4%	
16 Multiple Add'l Programs and Calcs		-		-	-		-	-	-	0.0%	
T1 NEW / ADDED DIVERSION	129,900	514,400	80,600	154,300	234,900	49,300	360,100	409,400	644,300	41.4%	
T2 BASE DIVERSION	73,200	102,700	45,400	30,800	76,200	27,800	71,900	99,700	175,900	11.3%	
T3 BASE DIVERSION C&D		10,800		2,400			8,400	8,400	10,800	0.7%	
T4 NEW TOTAL DIVERSION	203,100	627,900	126,000	187,500	313,500	77,100	440,400	517,500	831,000	53.4%	
NEW TONS TO FACILITIES ==>											
									to MRF	293,900	
									To composting	90,800	
									to C&D	226,400	
									To Reduction	32,900	
									FROM Landfill	644,000	

Share of "generation" for proper percentages

Res & Com'l, USD & GSD analyzed – (some programs not yet modeled)

Diversion – base & new (including red'n)

New Tons to /from Facilities

DRAFT only

Facilities

75%

HIGH PERFORMANCE

- Getting to 70/75%
- Funding / financial structure
- Policies / mandates
- Commercial

90%

ZERO WASTE

- Zero Waste Options
- Also discuss Collection and advanced recycling



FACILITIES

- Capacity and expansion
- New technologies



Recycling Processing Capacity



Regional Processing Capacity

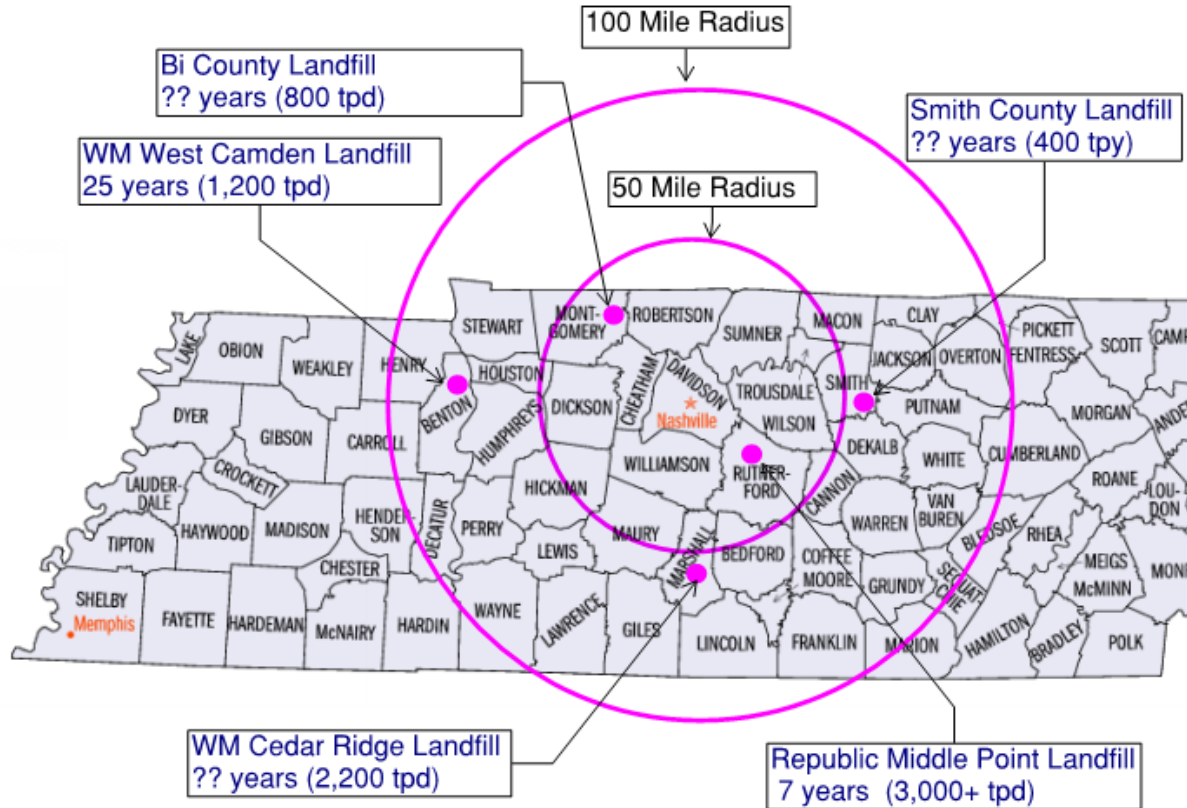
Facility	Materials Accepted	2016 Tons Reported to TDEC	Current Operating Capacity Tons/Yr	Available Operating Capacity Tons/Yr. (3 shifts)
Nashville RRC River Hills Facility	Fiber, Plastic, Aluminum, Metal Cans	33,343	48,000	144,000
Nashville RRC River Gate Facility	Fiber	N/A	30,000	90,000
Southeastern Recycling	Textiles, Aluminum, Fiber	4,850	X	X
Caraustar Recycling	Fiber, Plastic	4,085	X	X
Southern Recycling	Metal	25,310	X	X
Flom Corporation	Fiber	2,644	X	X
Pratt Industries	Fiber, C&D	6,000	29,000	72,000
West Rock	Fiber, Plastic	11,168	51,600	66,000
Combined Resources	Paper, Plastic	N/A	21,000	
Dynamic Recycling TN, LLC	Electronics	N/A	1,250	1,250
Interstate Batteries of Middle Tennessee	Batteries	755	38	40
Shapiro Recycling Systems	Metal	5,122	5,123	20,800
Strategic Materials	Glass	18,318	X	X
PSC Metals	Metal	64,353	252,420	420,000

Organics Processing Capacity



Regional Processing Capacity				
Facility	Materials Accepted	Current Operating Capacity Tons/Yr.	Available Operating Capacity Tons/Yr.	Capacity After Facility Expansion Tons/Yr.
Ground Up Recycling	Tires & Wood Pallets	21,000	30,000	N/A
AEP Inc.	Wood	13,505	unknown	N/A
The Compost Company, LLC	Food Waste, Yard Waste, Brush	6,000	2,000	11,000

MSW Landfilling



After Middle Point LF closes
WM has ample capacity
How to address lack of disposal competition?



High Level Siting Guidelines for Processing Facilities



Working with Metro Planning Department and Public Property Division to identify potential sites:

- Easy access to major roadways
- Heavy industrial zoned area
- Located outside 100-year floodplain



New Single Stream Materials Recovery Facility



BASIC SPECIFICATIONS	
Tons per Hour (TPH)	35
Tons per Year (TPY)	70,000
Sq. ft. Tipping Floor	6,000
Sq. ft. Building	60-75,000
Acreage	10-15



New Transfer Station



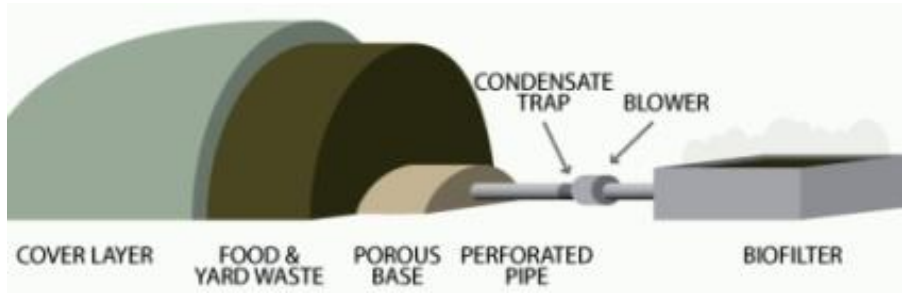
BASIC SPECIFICATIONS	
Ventilated Building	Odor Control
Tons per Hour	100
Tons per Year	80,000
Sq. ft. Tipping Floor	15,000
Acreage	10



New Covered Aerated Static Pile Composting



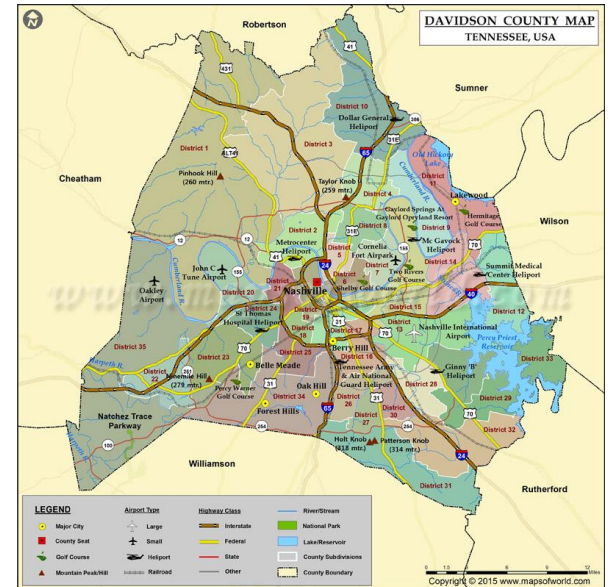
BASIC SPECIFICATIONS	
Covers or Building	Odor Control
Aeration Process	Faster Decomposition
Tons per Year	80,000
Sq. ft. Tipping Floor	15,000
Acreage	15



Other Facility Siting Options



- Expand existing facilities
- Private properties
- Regional Partnerships



Solid Waste Fund Structure



- Waste Management Program Funds
 - Solid Waste Operations – Special Revenue Fund
 - Solid Waste Grant – Special Purpose Fund
 - Tire Waste Grant – Special Purpose Fund
- Special Revenue Fund
 - Required by Solid Waste Management Act for municipal garbage services
 - Does not generate enough revenue to cover all expenses.
 - Any new fees charged under this fund must benefit the entire fee base
- Prior Landfill Enterprise Fund
 - Brush and recycling service are legacy services that were not part of the original tax base.

Solid Waste Fund Structure



- Program Revenue Sources – 22% of operating revenues
 - FY18 budget = \$5,500,000
 - Waste generation fees
 - Convenience center fees
 - Sale of Recyclables
- General Fund Transfers – 78% of operating revenues
 - FY18 budget accounts for approx. \$20,000,000
 - USD – 71%
 - GSD – 29%
 - Funding levels subject to annual budget process

Funding Structure Challenges



- General Fund limitations
 - Metro Charter doesn't allow separate charges for waste collection or disposal
 - Charter amendment required to implement new fees
- Lack of revenue generating facilities
- Funding options to consider
 - Countywide annual household fees
 - Self-funding programs
 - Public-private partnerships
 - Enterprise Fund

On-going Solid Waste Master Plan Efforts



- Finalize residential and commercial statistical surveys and review support for strategies
- Continue working on tonnage diversion forecasts
- Crafting and optimizing “high performing” program portfolios designed to achieve 70-75% diversion
 - Assess tonnage and costs (city and generator) for strategies / portfolio
 - Provide net changes in tons to facilities to other tasks
 - Funding / financing
 - Metrics analysis
- Finalize evaluation of facility needs