

DC Food & Yard Waste Diversion Progress & Plans

September 2017

DISTRICT OF COLUMBIA
DEPARTMENT OF PUBLIC WORKS
dpw
"The Preferred Choice"

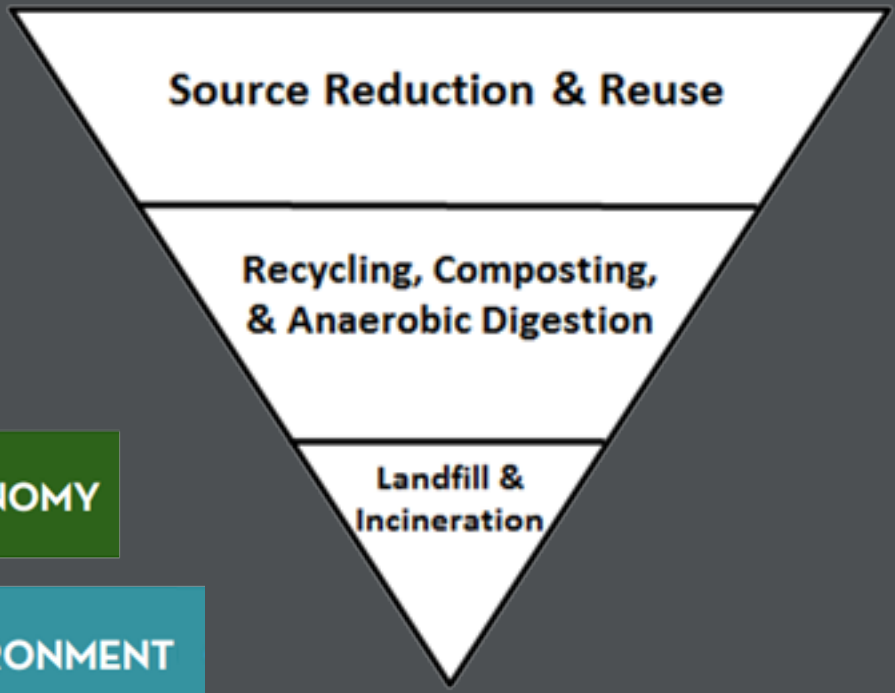
ZERO WASTE DC

SUSTAIN ABLE DC

ORGANIC WASTE DIVERSION BENEFITS AND SUSTAINABLE DC

SUSTAINABLE DC

- FOOD
- NATURE
- WASTE
- JOBS & THE ECONOMY
- CLIMATE & ENVIRONMENT



PLANNED STUDIES TO ASSIST WITH ZERO WASTE & INFRASTRUCTURE PLANNING

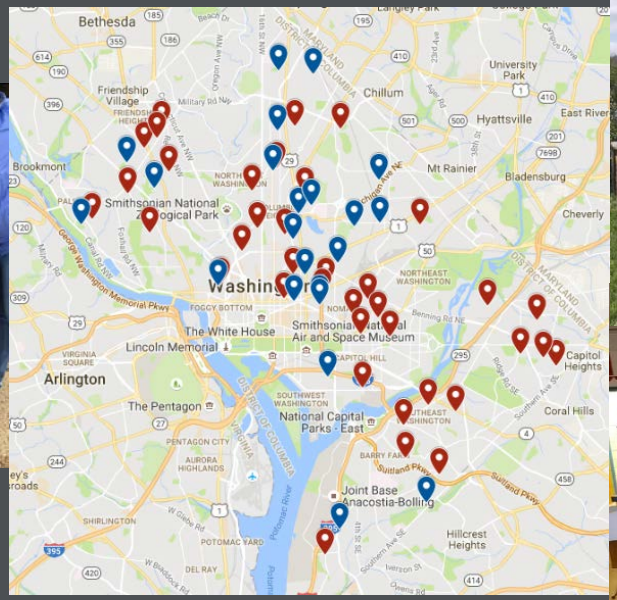
COMPOST COLLECTIONS & FEASIBILITY STUDY (05/17)

BLUE PLAINS CODIGESTION STUDY (FY 17 & FY18)

WASTE CHARACTERIZATION STUDY (FY 18)

SUSTAINABLE DC PLAN 2.0 (FY 18) & ZERO WASTE PLAN (FY 19+)

ORGANICS RECOVERY IN THE DISTRICT



Food Waste Drop-Off Program
8 Farmers Market Locations
> 400 households/wk participating
>3500 lbs/wk collected in Aug.

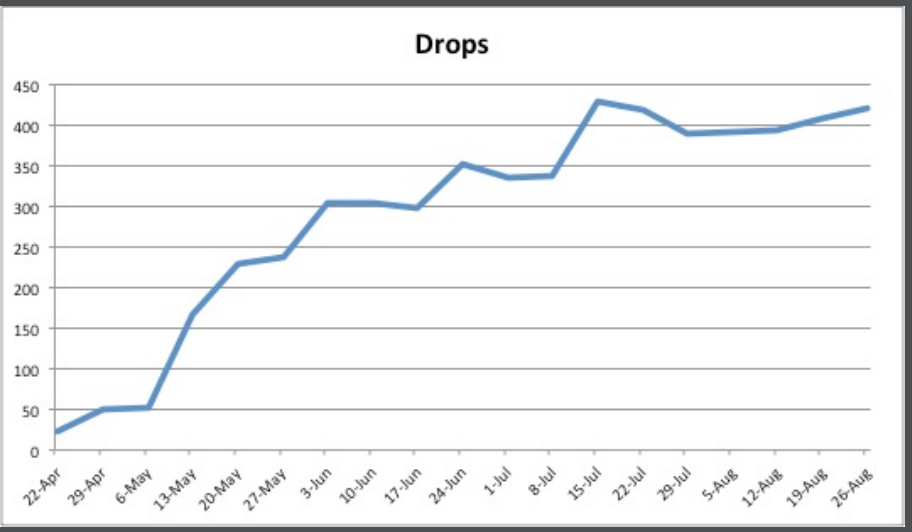
Cafeteria composting in 60 DC Public Schools this school year

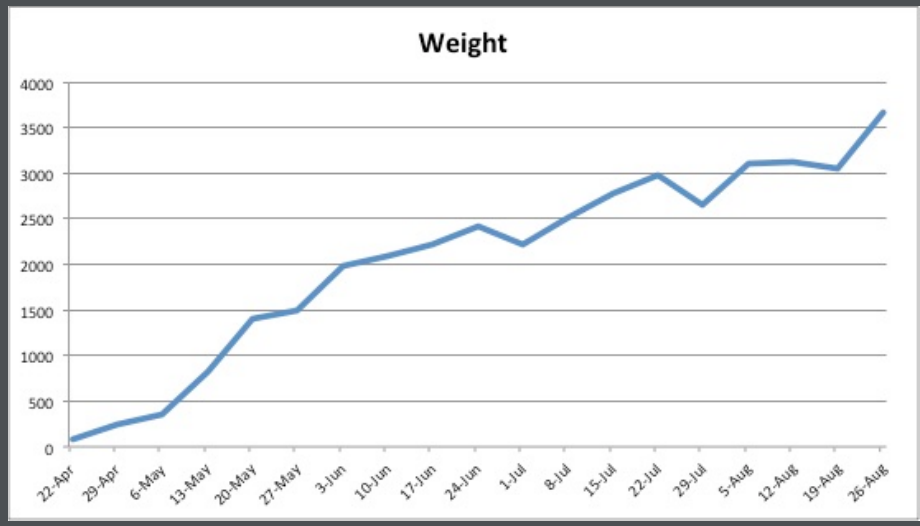
50 DPR community composting sites

FOOD WASTE DROP OFF

FOOD WASTE DROP OFF

FOOD WASTE DROP OFF DATA





Compost Feasibility Study

May 2017

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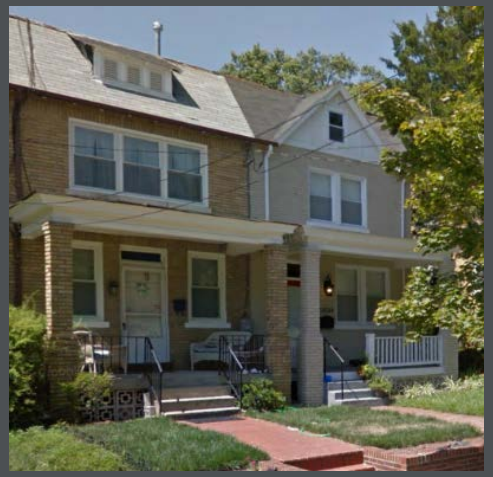
RRS recycle.com

WASTE SERVICES IN THE DISTRICT



DPW COLLECTION SERVICES

- Single-family homes and apartment buildings with three or fewer living units; ~ 105,000 households
- Semi-automated trucks; three-person crews
- All materials transfer to long-haul trucks at DPW's Ft. Totten and Benning Road facilities

COMMERCIAL COLLECTION SERVICES

- Apartment buildings with four or more units, mixed-use buildings, and commercial properties; including more than half of DC households
- Materials taken to DPW transfer stations, private transfer stations, composting, waste to energy, landfill, and material recovery facilities (MRF)

CURBSIDE ORGANICS COLLECTION PROGRAMS: MODEL PROGRAM

- Residents receive three bins: black, blue and green.
- Green bin is for food and yard waste that the city hauls to a nearby composting facility.
- Food and yard waste is comingled and collected via new dedicated routes.
- Material direct-hauled to compost facility

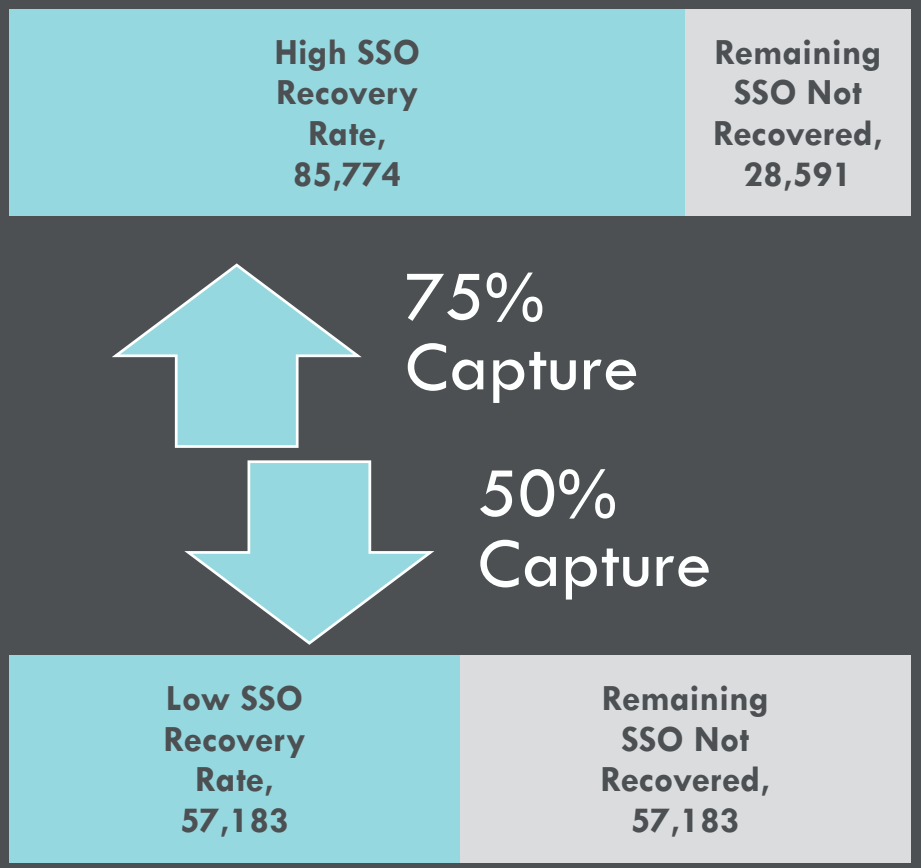
ORGANICS GENERATION

SSO = Source-Separated Organics (food waste & yard waste)

SECTOR	GENERATION (TONS/YEAR)	RECOVERY POTENTIAL LOW (TONS/YEAR)	RECOVERY POTENTIAL AVERAGE (TONS/YEAR)
SSO Curbside Collection Program	21,056 to 59,221	10,719	30,490
Commercial Landscapers Drop-off Potential	13,427	13,427	13,427
Multi-family Diversion Potential	17,962 to 47,761	7,185	19,105
Commercial and Institutional	114,365	57,183	85,774
Total Generation	**234,774**		
Total Diversion Potential		**88,513**	**148,796**

COMMERCIAL AND INSTITUTIONAL SECTOR

Commercial & Institutional Generation (tons)	
Supermarkets and Grocery Stores	9,692
Full Service Restaurants	35,987
Limited Service Restaurants	12,205
Colleges/Universities	28,954
Elementary and Secondary Schools	3,038
Large Hotels	10,770
Assisted Living and Nursing homes	2,460
Hospitals	10,226
Grocery Store Distributors	1,033
Commercial Total	114,365



Source: ReFED supported generation rates

DCDPW CURBSIDE COLLECTIONS

BASE CASE OF ANTICIPATED COLLECTION SERVICES			
		For Low Generation	For Average Generation
Program Details	Organics diversion	10,719 tons	30,490 tons
	Required number of new trucks	21 trucks	35 trucks
Capital Costs	Total startup capital cost of containers	$4,342,008	$4,342,008
	Total capital cost of trucks	$4,110,000	$6,960,000
Annualized Costs	Total annual cost of program	$5,912,459	$9,024,618

REGIONAL PROCESSING CAPACITY: LIMITED EXCESS CAPACITY

FACILITY NAME	MILEAGE FROM DCDPW TS	ACCEPTING FOOD WASTE	CAPACITY	THROUGHPUT	TIP FEE
Prince George's	25	Yes	Expanding to 8,000 tons/year FW & 60,000 tons/year YW	4,000 tons/year FW & 50,000 tons/year YW	$35
Balls Ford Road Facility Operated By Free State Farm	35	Yes	80,000	Expanding, currently accept less than half that	$35
Loudoun Composting	42	**NO**	~45, 000 tons/year		$35
Harvest Recycled Green Industries	41	**NO**	~ 30,000 – 40,000 tons/year		Based on Truck Size
ACME	20	**NO**	10,000		$32

Note: This includes facilities accepting yard waste; not a comprehensive list. Summer 2016 data

JUSTIFICATION FOR IN-DISTRICT COMPOSTING

- Current transfer stations not set up to separate three waste streams
- Current transfer stations would require significant investment to upgrade for organics transfer
- The cost to transfer is $37/ton plus $2.3 million (approx.) to build new transfer station.
- Reduction in annual transfer costs ($1.13M) is sufficient to build a facility in-District.
- There is currently limited regional capacity to accept food waste.

CURBSIDE COMPOSTING STUDY RECOMMENDATIONS

- Collection costs are substantial and efficiencies require improvements
- Residential co-collection of FW and YW is recommended
- FW and YW should not be transferred
- In-District Organics Processing Facility is preferred

CURBSIDE COMPOSTING FEASIBILITY FINDINGS SUMMARY

DIVERSION POTENTIAL
- 30k tpy of commingled food and yard waste from DPW serviced households
- 45% - Projected residential diversion rate with adoption of collection program
- Opportunity to recover 150k tpy with policy and new infrastructure

JOB CREATION
- 6 – 12 fulltime facility operation jobs plus additional staff required for collection

ANNUALIZED COST OF CURBSIDE PROGRAM
- $5.9M - $9.0M

INFRASTRUCTURE
- Proposes in-city covered aerated static pile facility
- 10-20 acres
- Capacity: 30k – 150k tpy
- $7-$12M

ROLL-OUT SCHEDULE
- Five year roll-out plan to all DPW-Serviced households

DISTRICT NEXT STEPS

- Continued investment in existing District compost programs
- Solicit feedback on study to inform zero waste plan.
- Update food waste regulations
- Conduct co-digestion feasibility study
- Collaborate with neighboring jurisdictions and Office of Public Private Partnerships to encourage organics recovery infrastructure development

*As outlined in DPW letter accompanying compost study.

ZERO WASTE DC

QUESTIONS, COMMENTS & FEEDBACK

ANNIE WHITE
(202) 438.8277
ANNIE.WHITE4@DC.GOV

ASSUMPTIONS - SOURCE SEPARATED ORGANICS (SSO) CO-COLLECTION MODEL

GENERATION RATES

Food Waste: Low: 200 and Average: 525 pounds/household/year
Yard debris: Low: 200 and Average:600 pounds/household/year

TIP FEE

$35/ton

PARTICIPATION RATES: Expected Participation Scenario Assumptions*

	Route Number							
	107-112	207-209	314-330	404-424	508-527	604-618	711-716	813-816
FW Participation Rate	50%	50%	50%	50%	30%	30%	30%	30%
YW Participation Rate	70%	70%	70%	70%	50%	50%	50%	50%
Set-Out Rate	80%	80%	80%	70%	70%	70%	70%	70%

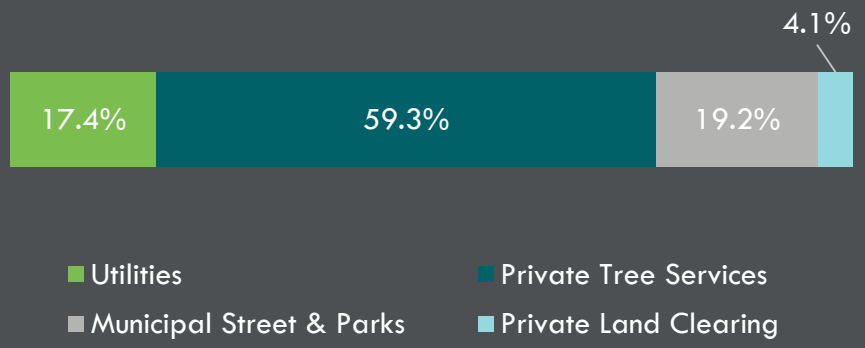
*Participation rates are based on observed recycling rates on recycling routes

TRUCKS AND CONTAINERS

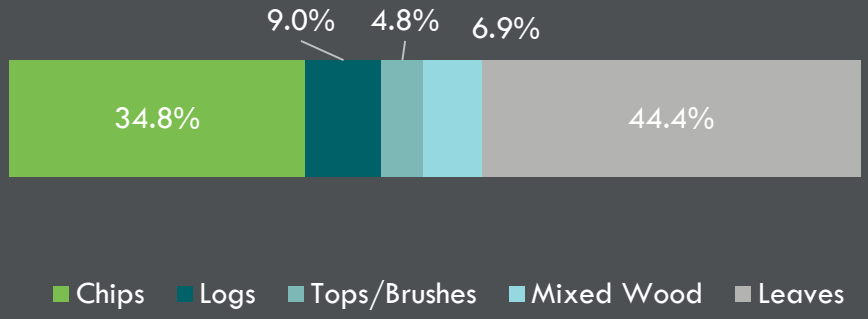
Inner-District Wards 1, 2, and 6: 48 gallon carts, 13 cubic yard trucks
Outer-District Wards 3, 4, 5, 7, and 8: 64 gallon carts, 16 cubic yard trucks

COMMERCIAL LANDSCAPER YARD WASTE DROP OFF

Commercial Sources of Yard Waste in the District	
Source	Tons per Year
Utilities	2,334
Private Tree Services	7,961
Municipal Street & Parks	2,583
Private Land Clearing	549
Total	13,427



Commercial Wood Type Generation in the District	
Wood Type	Tons per Year
Chips	4,670
Logs	1,208
Tops/Brushes	649
Mixed Wood	932
Leaves	5,968
Total	13,427



COSTS FOR VARIOUS TECHNOLOGIES

TABLE A3: COSTS FOR VARIOUS TECHNOLOGIES						
Compost System	Debt Service $/ton	O&M $/ton	Gross	Revenue	Required Tip Fee	Site Requirements
Backyard	N/A	N/A	N/A	N/A	N/A	N/A
Windrowing	4	54	58	$12 - $20	46	20 - 25 acres
Static Pile	5	55	60	$12 - $20	48	20 - 25 acres
Aerated Static Pile (ASP)	6	55	61	$12 - $20	49	10 - 25 acres
Wet Anaerobic Digestion	26	65	91	$22 - $26	69	5 - 10 acres
Dry Anaerobic Digestion	47	48	95	$18 - $23	77	5 - 10 acres
Co-Digestion	46	55	101	$10-$15	91	5 - 10 acres

CONSIDER DEVELOPING REQUIREMENT FOR LARGE QUANTITY FOOD WASTE GENERATORS TO COMPOST ONCE FACILITY IS IN OPERATION

GENERATION TONS/YEAR	114,365
POTENTIAL RECOVERY 50% TONS/YEAR	57,183
POTENTIAL RECOVERY 75% TONS/YEAR	85,774

- Connecticut 2010 Commercial Organics Recycling Law
- Vermont 2012 Universal Recycling Law
- California 2014 Mandatory Commercial Organics Recycling (MORe)
- Massachusetts 2014 Commercial Food Waste Disposal Ban

TRANSFER STATIONS CURRENT CONDITIONS

DPW-operated transfer stations do not have space to handle source separated food waste or additional source separated yard waste.

ORGANICS TRANSFER COSTS

TRANSFER STATION COST	
Transfer Station Capital Cost	$2,295,000
Transfer Station Capital Cost (Annualized)	$238,678
Transfer Station Operating Cost (Annualized)	$540,150
Total Annual Transfer Station Cost	$778,828
Management Allowance (10% of total cost)	$155,766

NEW TRANSFER STATION:

- The cost of new organics transfer station is nearly $2.3 million
- New transfer station tip floor would require 13,000 to 17,000 square feet in tipping floor space, plus 5 to 8 acres for site
- Or need to add 15,000 square feet onto current transfer stations

The cost of operations of a transfer station receiving SSO: $33.70 per ton with an additional $2.00 per ton for trucking 40 miles.

TRADE OFF: TRANSFER STATION VS. COMPOST FACILITY

PROCESSING FACILITY COST AND ADDITIONAL CAPITAL ANALYSIS		
	Transfer	No Transfer
Organics Diversion	30, 490 tons	30,490 tons
Transfer Cost	$37/ton	$0/ton
SSO Processing Tip fee	$35/ton	$35/ton
Total SSO Processing Cost	$72/ton	$35/ton
Annual Cost of Transfer	**$1.13M**	

Processing Capital:
Reduction in annual transfer costs ($37/ton) provides 1.13M annual savings for investment alternatives that can reduce operating costs