City of Philadelphia

Municipal Waste Management Plan 2019–2028

MSW CONSULTANTS

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  - Neil Garry, City Planner

- City of Philadelphia Solid Waste and Recycling Advisory Committee (SWRAC):
  - Fern Gookin, Revolution Recovery (Co-Chair)
  - Kelly Offner, Keep Philadelphia Beautiful (Co-Chair)
  - Members of the SWRAC (detailed in Chapter 13)

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GLOSSARY OF ACRONYMS & KEY TERMS

Abbreviation	Explanation
CY	Cubic Yard
C&D	Construction and Demolition Waste
EPA	United States Environmental Protection Agency
EPS	Expanded Polystyrene (#6 plastic)
E-Waste	Electronic Waste
FY	Fiscal Year
GHG	Greenhouse Gas
GPD	Gallons per Day
HDPE	High-Density Polyethylene (#2 plastic)
HHW	Household Hazardous Waste
ICW	Infectious and Chemotherapeutic Waste
KAB	Keep America Beautiful
KPB	Keep Philadelphia Beautiful
LDPE	Low-Density Polyethylene (#4 plastic)
MGD	Million Gallons per Day
MRF	Materials Recovery Facility
MSW	Municipal Solid Waste
MTCE	Metric Tons of Carbon Equivalent
MTCO2E	Metric Tons of Carbon Dioxide Equivalent
OCC	Old Corrugated Containers (cardboard)
ONP	Old Newspaper
O&M	Operation and Maintenance
PADEP	Pennsylvania Department of Environmental Protection
PBR	Permit by Rule
PEC	Pennsylvania Environmental Council
PET	Polyethylene Terephthalate (#1 plastic)
PHA	Philadelphia Housing Authority
PHL	Philadelphia International Airport
PMBC	Philadelphia More Beautiful Committee

GLOSSARY OF ACRONYMS & KEY TERMS

Abbreviation	Explanation
PP	Polypropylene (#5 plastic)
PPR	Philadelphia Parks and Recreation Department
PWD	Philadelphia Water Department
RFP	Request for Proposals
RMW	Regulated Medical Waste
RMP	Residential Mixed Paper
SDP	School District of Philadelphia
SEPTA	Southeastern Pennsylvania Transit Authority
SWEEP	Streets and Walkways Education and Enforcement Program
SWRAC	Solid Waste and Recycling Advisory Committee
MWMP	Municipal Waste Management Plan
TPD	Tons per Day
TPY	Tons per Year
WARM	Waste Reduction Model (EPA)
WTE	Waste-to-Energy
WWTP	Wastewater Treatment Plant

E. EXECUTIVE SUMMARY

E.1 INTRODUCTION AND PLAN REQUIREMENTS

Pennsylvania counties and the City of Philadelphia (City or Philadelphia) are required to develop a Municipal Waste Management Plan (MWMP or Plan) in accordance with the Municipal Waste Planning, Recycling and Waste Reduction Act of 1988 (also known as Act 101 of 1988), and based on guidance issued by the Pennsylvania Department of Environmental Protection (PADEP).

MWMP updates are required every 10-years, or upon request by PADEP. The overarching requirements of the MWMP are to: 1) demonstrate that Philadelphia has secured adequate disposal or processing capacity for all City-generated municipal solid waste over a 10-year planning period, and 2) to demonstrate City efforts to implement feasible recycling initiatives to advance waste diversion to the Act 101 recycling goal of 35 percent diversion of solid waste to recycling. PADEP requires an open planning process by which the public and stakeholders, through the City's Solid Waste and Recycling Advisory Committee (SWRAC), can provide input and comments pertaining to Plan development and revisions.

This Plan update was initiated by the City in response to a request by PADEP to complete a "non-substantial Plan revision" to incorporate information pertaining to the waste disposal and recyclables contracts that were executed between the City and regional waste and recyclables processors in July 2019. This Plan covers the 2019 – 2028 planning period. Under this non-substantial Plan revision, the City does not propose to develop, own or operate new or expanded municipal solid waste disposal or processing infrastructure, and no major recycling programs are being introduced or discontinued.

While a primary purpose for this Plan update included updating information for the City's current disposal and recyclables processing contracts, the Plan additionally updates solid waste generation, disposal and recycling data, waste generation projections, and recycling initiative information. This Plan update aligns with the goals and objectives identified in broader City policy documents, including the Zero Waste and Litter Action Plan (2017) and Philadelphia GreenWorks (2016 update).

This Executive Summary presents how the Plan document is organized, summarizes City's solid waste generation data, identifies the facilities used for processing City-generated municipal waste (including recyclables), and highlights Philadelphia's municipal waste planning initiatives.

E.2 PLAN ORGANIZATION

This Plan is organized to follow the requirements as laid out Pennsylvania Code and in guidance documents from PADEP regarding the development of municipal waste plans. It is comprised of the following 13 chapters and appendices:

Introduction: Introduces plan development requirements per Act 101, Pennsylvania Code and PADEP guidelines. Provides the City history of the previous planning process and identifies City strategic goals and initiatives pertaining to waste management.

Chapter 1 – Description of Waste: Presents the City's generation profile for municipal wastes, construction and demolition debris, and biosolids. Details municipal waste disposal and recycling by sector and by waste composition from 2007 until present day.

Chapter 2 – Description of Facilities: Details facilities that have accepted City-generated waste in 2018, facilities contractually obligated to accept and process City residential waste, and any State-permitted facilities identified in the region with available capacity for City-generated commercial and institutional wastes including those delivered by private collectors or haulers.

Chapter 3 – Estimated Future Capacity: Provides an analyses of the City's total municipal waste generation, accounting for materials diverted to recycling, to estimate the annual disposal capacity needed by the City over the 10-year planning period.

Chapter 4 – Description of Recycling Programs: Inventories the City's recycling programs and initiatives including City-provided curbside collection programs, City recycling and litter initiatives, recyclables processing, commercial and multi-family waste management requirements, organics collection and recycling programs. Quantifies recycling efforts by material type and presents the environmental benefits of recycling.

Chapter 5 – Selection and Justification of Municipal Waste Management Programs: This chapter identifies and evaluates selected waste management programs and initiatives. The chapter also discussed solid waste management alternatives.

Chapter 6 – Location: The inventory of locations of available waste disposal and processing facilities.

Chapter 7 – Implementing Entity Identification: Addresses and certifies that Streets Department is responsible for implementing the plan on behalf of City.

Chapter 8 – Public Function: Addresses private and public sector ownership and activities in collection, disposal, and processing of City's municipal waste.

Chapter 9 – Implementing Documents: These include municipal ordinances, codes, regulations, executive orders, contracts, and other documents that identify the City's authority to execute the MWP.

Chapter 10 – Orderly Extension: Description of how the City's waste management system is coordinated with other county plans, ordinances, and programs.

Chapter 11 – Methods of Disposal other than by Contract: Describes disposal methods for City municipal waste that are not under the purview of the City via contract. Primarily this includes the allowance of private haulers serving the city to use State-permitted disposal or processing facilities.

Chapter 12 – Non-Interference: Addresses how the City's plan will not interfere with existing private sector facilities.

Chapter 13 – Public Participation: Confirms participation by a diversely represented advisory listing of SWRAC members, SWRAC meetings notices, agendas, and backup and other public information documents.

Appendices: These include contracts, ordinances, codes, regulations, and other documents for reference. The appendices are list below in order of reference within the plan document.

- **Appendix A –** Philadelphia Disposal and Recyclables Processing Contracts
- **Appendix B –** City Council Bills, Ordinances, Codes, and Executive Orders
- **Appendix C –** 2019-2020 SWRAC Meeting Minutes and Materials
- **Appendix D –** SWRAC Comments on 2019-2028 Plan

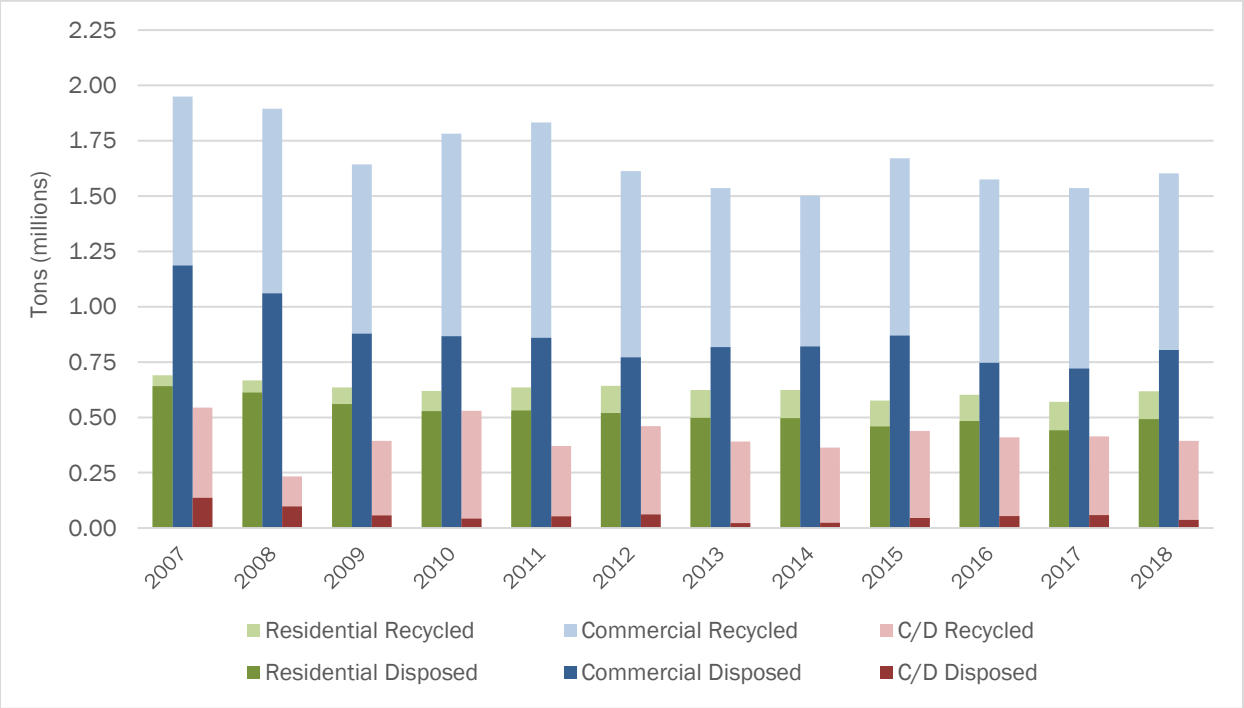
E.3 SUMMARY OF PHILADELPHIA'S WASTE SYSTEM

The City of Philadelphia's Streets Department (Streets Department) operates one of the largest solid waste collection systems in the U.S. The Department provides weekly collections of trash and recyclables to approximately 540,000 households (residential structures of six dwelling units or less), offers seasonal leaf waste collection services, and operates multi-material recyclables drop-off centers at six sanitation convenience centers. Streets Department and Philadelphia Parks and Recreation crews also collect trash and recyclables from City facilities, parks, and public spaces fitted with litter baskets and BigBelly smart compaction receptacles.

Businesses, institutions, and large multi-family properties including the School District of Philadelphia and colleges and universities, primarily contract independently for solid waste and recycling services with one or more private hauling companies serving the City.

Figure E-1 below shows the 2007 to 2018 generation of residential, commercial, and construction and demolition wastes broken down to show the amounts disposed and estimated recycled for each waste stream.

Figure E-1 Municipal Waste and C/D Generation (2007 – 2018)



Source: MWMP Tables 3-1 through 3-5.

E.3.1 MUNICIPAL SOLID WASTE (MSW) GENERATION

"Municipal solid waste" (MSW) refers to routinely generated conventional garbage and source-separated recyclables from households, businesses, and institutions. In 2018, a combined 2.2 million tons of MSW (including recyclables) were generated by Philadelphia's 1.58 million residents, and 50,000 businesses and institutions. Of this total, approximately 1.6 million tons, or 72 percent originated from commercial and institutional sources, while nearly 619,000 tons, or 28 percent, originated from residential sources. 2018's tonnages by generating sector are detailed in Table E-1. The City's estimated diversion rate for standard recyclable materials is 41.6 percent, which exceeds the Act 101 diversion rate target of 35 percent. When estimated C&D recycling quantities are included, the City's diversion increases to 49 percent.

Table E-1 Philadelphia MSW Generation (2018)

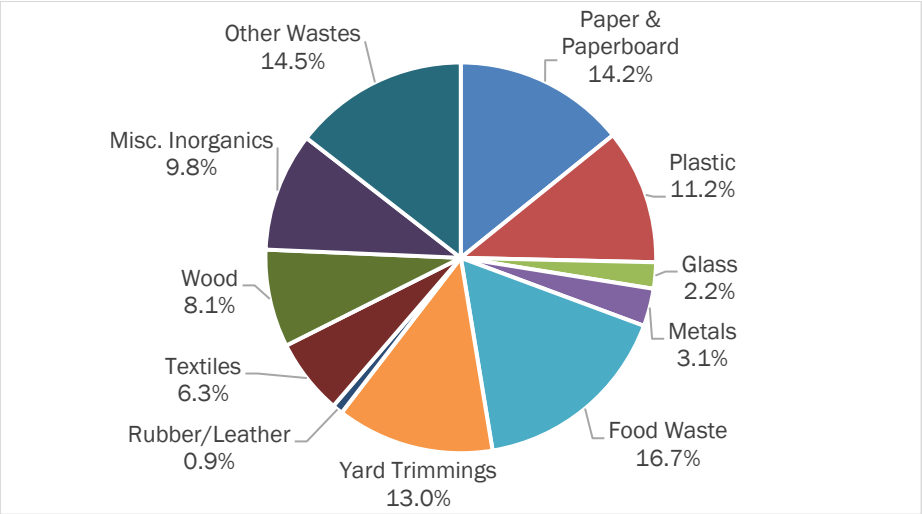
Parameter	Residential	Commercial	Total
Recycled MSW (tons)	126,802	798,075	**924,877**
Disposed MSW (tons)	491,710	804,133	**1,295,843**
Generated MSW (tons)	**618,512**	**1,602,208**	**2,220,720**
Estimated Diversion Rate	20.5%	49.8%	**41.6%**
% of Total MSW Generation	27.9%	72.1%	**100.0%**

Source: MWMP Tables 3-1 through 3-5.

E.3.2 COMPOSITION OF RESIDENTIAL SOLID WASTE

To assess opportunities to recycle and to understand the composition of City-generated MSW, the City periodically performs waste composition studies. Waste stream characterization, or composition studies guide long-term planning for solid waste and recycling programs. The most recent study in 2017 was performed over two seasons and analyzed over 200 residential waste samples originating from the City's 13 sanitation districts. The waste was sorted into more than 40 materials categories. The results are summarized in Figure E-2.

Figure E-2 Residential Waste Composition



Source: City of Philadelphia 2017 Waste Characterization Study

E.3.3 CONSTRUCTION AND DEMOLITION WASTE GENERATION

Construction and demolition (C&D) waste is municipal waste resulting from the construction, reconstruction, renovation, and demolition of buildings and other structures, including, but not limited to, wood, plaster, metals, asphalt, bricks, block and unsegregated concrete.

Special attention is given to C&D generation, disposal, and recycling because it accounts for a significant portion of the City's overall solid waste stream and represents opportunities for diversion to reuse and recycling. C&D recycling is counted towards the City's 2035 Zero Waste and Litter goal. C&D tonnage generation, including total disposed, and estimated recycled amounts, are presented in Table E-2.

Table E-2 C&D Waste Generation in Philadelphia (2018)

Parameter	Quantity of C&D Waste (tons)
Total C&D Waste Disposed	36,971
Reported C&D Waste Recycled	356,358
Total C&D Waste Generated	**393,328**
Estimated C&D Waste Recycling Rate	90.6%

Source: MWMP Table 1-7.

E.3.4 CURRENT FACILITIES

The City's contracted waste disposal facilities, as well as contracted recyclables processing facility, are detailed in Table E-3. Private haulers rely on State-permitted waste and recyclables processors in the Philadelphia region.

Table E-3 Residential Disposal and Processing Facilities

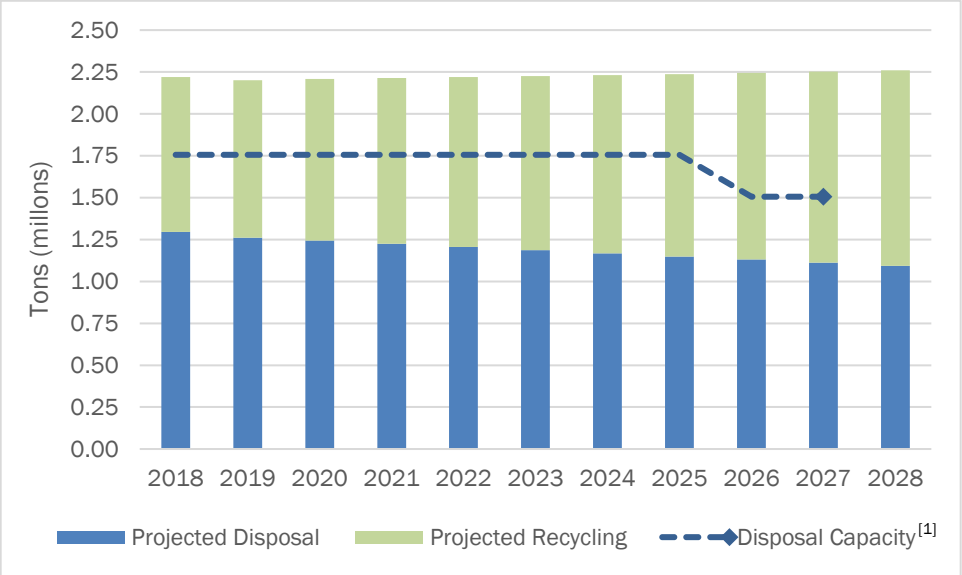
Disposal Facilities	Daily Quantity (in Tons Per Day)
Waste Management of Pennsylvania, Inc.	
Forge Transfer Station/SpecFUEL™ Facility/Core Organics Recycling	950
Philadelphia Transfer Station and Recycling Facility	625
Covanta 4 Recovery, LP	
58th Street Transfer Station	665
Delaware Valley Resource Recovery Facility Covanta Plymouth Renewable Energy	270 [1]
Recyclables Processing Facility	**Daily Quantity**
Waste Management of Pennsylvania, Inc.	
Forge Materials Recovery Facility (Bleigh Avenue)	340
Philadelphia Transfer Station and Recycling Facility (Grays Ferry Avenue)	60

Source: MWMP Table 5-1.
[1] Combined Maximum Daily Quantity for Delaware Valley Resource Recovery Facility and Covanta Plymouth Renewable Energy.

E.4 FUTURE MSW GENERATION AND DISPOSAL CAPACITY

To confirm the City has adequate disposal capacity for its MSW, the City must estimate future MSW generation and incorporate the 10-year waste projections within its Plan. Residential municipal waste generation rates are projected on a per-capita basis, and commercial municipal waste generation rates are projected on a per-employee basis. Population and employment forecasts from the Delaware Valley Regional Planning Commission (DVRPC) are used with the per-capita and per-employee generation rates to calculate gross municipal waste quantities for the 10-year planning period. Diversion rates for residential and commercial sources are projected based on steadily increasing recycling to achieve the City's 50 percent overall recycling goal by the end of the planning period. Figure E-3 presents the projected MSW generation, including disposed and recycled quantities. Through the combination of executed contracts for City-collected waste and the regional disposal capacity utilized by private haulers, the City has sufficient disposal capacity available through the end of the planning period.

Figure E-3 Projected MSW Generation (2018 – 2018)



Source: See Tables 3-1 through 3-5.
[1] The City intends to survey regional facilities to assess available processing capacity for years beyond 2027.

E.5 MSW MANAGEMENT AND PLANNING INITIATIVES

The City employs comprehensive and integrated waste management strategies that strike balance between City-provided collection and managements services and many private collectors and processors serving Philadelphia and the surrounding region. MSW management, including education and enforcement, and planning initiatives to increase diversion and preserve natural resources are reinforced by the City's extensive codes, ordinances, agencies, staff and programs. This Plan and City MSW initiatives align with the goals and objectives identified in broader City policy documents, including the Zero Waste and Litter Action Plan (2017), and Philadelphia GreenWorks (2016 update). Some more recent planning initiatives are highlighted in Table E-4.

Table E-4 MSW Planning Initiatives

Continue Efforts to Improve Recyclables Materials Quality	Volatile recovered materials end market conditions of the past few years have underscored the importance of recyclables quality. Recyclables quality will continue to be a key focus of the Streets Department's outreach programs. This will include a curbside recycling bin monitoring and tagging outreach program slated to begin in summer/early fall of 2020. These efforts will be supported by a resumption of regular composition studies of the City's curbside recycling stream.
Monitor the Changing Municipal Solid Waste Stream	The City will continue to monitor changes to the MSW stream's volume and composition so it can make informed waste management policy and program decisions, including reviews of recycling program effectiveness. The Streets Department is scheduled to perform a revised residential solid waste characterization study in 2020.
Evaluate Organics Recycling Opportunities	Organic wastes (yard wastes and food wastes) are the largest components of the City's solid waste stream. The City will continue to champion diversion programs targeting food waste recovery, such as the

	successful food waste composting program managed by the Philadelphia Prisons System, as well as examine other opportunities to recover organics, such as increasing the recovery of organics from the residential waste stream.
Continue Educational and Outreach Initiatives to Improve Recycling & Reduce Litter	The City has developed many resources, initiatives and incentives to support its recycling program, including the CleanPHL website, a commercial recycling toolkit, public space recycling (BigBelly), and comprehensive anti-litter campaigns. In addition, the City has employed integrated media approaches using transit advertising, television commercials, print advertising, direct mail and social media. The City will continue its strong commitment to recycling and litter education and outreach, and continue collaboration with its broad range of stakeholders.
Enhance Commercial Recycling Reporting	The ability to obtain and process data is critical in all recycling programs – particularly so in those with zero waste goals. As noted in this Plan, the City has experienced challenges with obtaining timely recycling data and reports from many large generators, and will continue to examine mechanisms to improve data gathering and analyses.

E.6 CONCLUSIONS

The City of Philadelphia operates and regulates a proven solid waste system that serves about 540,000 residential households. Philadelphia's waste management programs are complemented by an open market system of private sector-provided services for hauling, and processing of waste, recyclables, organics and special items for commercial and institutional establishments. The City facilitates a comprehensive and integrated waste management program that promotes proper disposal and recycling through education and outreach, technical guidance, ordinances and enforcement for commercial establishments, City buildings, schools and public spaces. Moreover, the City has a Solid Waste and Recycling Advisory Committee (SWRAC) made up of representatives from environmental groups, civic organizations, the recycling and solid waste industry, and City agencies that meets regularly on solid waste and recycling issues and provides input on City solid waste challenges and initiatives.

Philadelphia's waste system has consistently met or exceeded the 35 percent recycling goal established by Act 101 of 1988. The City's role within an integrated waste management system is consistent with PADEP guidelines and Commonwealth Court decisions supporting county involvement in solid waste management as part of protecting public health, safety and welfare and responsibly managing solid waste system costs. The City's comprehensive residential curbside collection programs for wastes, recyclables, and seasonal leaf waste along with submitting annual recycling reports to PADEP satisfy Philadelphia's primary recycling requirements under Act 101 of 1988. Philadelphia continues to be vested in evaluating, improving and implementing responsible waste management programs that benefit the City, its residents and businesses.

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I. INTRODUCTION & PURPOSE OF PLAN

I.1 BACKGROUND

The 2019-2028 Municipal Waste Management Plan (Plan) for the City of Philadelphia (City) has been prepared in accordance with the Pennsylvania Municipal Waste Planning, Recycling, and Waste Reduction Act of 1988 (Act 101), the Pennsylvania Department of Environmental Protection (PADEP) January 2010 Guidance Document "*Guidelines for the Development and Implementation of County Municipal Waste Management Plan Revisions*" (Document Number 254-2212-504), and based on discussions with PADEP during Plan preparation.

On July 3, 2013, in accordance with Section 271.252 of Title 25 of the Pennsylvania Code, the City provided written notification to PADEP that a substantial Plan revision would be prepared by the City's Streets Department. The notice stipulated that the plan revision would cover a ten-year planning horizon, and would provide for updates to all components of the City's solid waste management system, specifically including incorporation of results from the Streets Department's Request for Proposals (RFP) process for the selection of new solid waste disposal contracts commencing in July, 2012. After a comprehensive planning process and considerable stakeholder engagement, the City submitted a draft plan to PADEP in March 2017. On June 29, 2017, following consultation with PADEP, the City agreed to withdraw the March 2017 draft plan and submit a **non-substantial plan revision** to incorporate the City's existing disposal contracts and update its list of designated disposal facilities. This revised non-substantial plan update includes and coincides with the issuance of a Request for Proposals in 2018 for disposal of City-collected waste (the contracts were awarded and became effective July 1, 2019), and an update of facilities designated for disposal of privately-collected waste. This plan update also includes more recent program data and analysis, including the City's Zero Waste goals.

I.2 PLAN REQUIREMENTS

The City of Philadelphia and all other Pennsylvania counties are required by State law to develop a Municipal Waste Management Plan (Plan) and to perform an update to it every 10 years. The Plan serves as an important guidance document that establishes the City of Philadelphia's goals and objectives for solid waste management, including strategies and programs for responsible management of municipal waste and recyclable materials in accordance with Commonwealth requirements.

The general and primary purposes of Municipal Waste Management Plans per PADEP regulations are to:

(1) Ensure the county has sufficient processing and disposal capacity for its municipal waste for at least 10 years.

(2) Ensure a full, fair and open discussion of alternative methods of municipal waste processing or disposal.

(3) Ensure maximum feasible waste reduction and recycling of municipal waste or source separated recyclable material.

(4) Shift the primary responsibility for developing and implementing municipal waste management plans from municipalities to counties.

(5) Conserve resources and protect public health, safety and welfare from the short and long-term dangers of transportation, processing, treatment, storage and disposal of municipal solid waste.

Plans must be updated every 10 years and are classified by PADEP as either:

- **Non-substantial Plan Revision**: Standard revisions to address a new 10-year planning period including updates to: waste and recycling program descriptions, waste generation data including waste diversion to recycling, waste projections and estimated disposal capacity requirements, and securing

(via contract(s)) adequate disposal capacity for county-generated MSW over the 10-year planning period. Public participation includes Solid Waste Advisory Committee (SWAC) meetings[1]. A non-substantial plan revision will be deemed approved within 30 days of receipt by PADEP, unless PADEP responds in writing.

- **Substantial Plan Revision**: This determination is made when 1) a county eliminates an in-county recycling program that results in reduced recycling volume, or 2) a county adds municipal waste streams not originally included in its existing Plan. Substantial updates require additional public participation and involvement for plan ratification due to changes to previous solid waste management conditions. The public comment period for a substantial plan revision is 90 days. The governing body of the county shall adopt the plan within 60 days of the end of the public comment period. Within 10 days of Plan adoption, the plan must be sent to the municipalities for ratification.

This Plan update covers the planning period 2019 – 2028 and is considered a **non-substantial revision**. Important elements of this plan revision include:

- Waste and recycling program descriptions
- Waste generation data including waste diversion to recycling
- 10-year waste projections and estimated disposal capacity requirements
- The combination of contractually secured disposal and processing capacity for City-collected municipal waste and regional capacity available for privately-collected municipal waste ensures capacity for all City-generated MSW for the 10-year planning period.
- Public participation including that of the City's Solid Waste and Recycling Advisory Committee (SWRAC) and meetings to provide feedback on solid waste issues.

I.3 INTEGRATED MUNICIPAL WASTE MANAGEMENT

Pursuant to Pennsylvania requirements and as described in this Plan, the City is obligated to implement its plan in support of an effective waste management system. The Commonwealth Court supports integrated waste management systems where counties implement programs to avoid the costs of waste disposal. Because of its size, the City of Philadelphia's waste management system operates at a regional scale and in part relies on collectors, disposal, and recyclables processors who may be located outside of the City's corporate boundaries. Municipal waste is managed primarily through collection, transportation, landfill disposal, waste-to-energy disposal, and recyclables processing. Some organics are diverted to compost facilities or grinding operations. Essential municipal waste operations are described below:

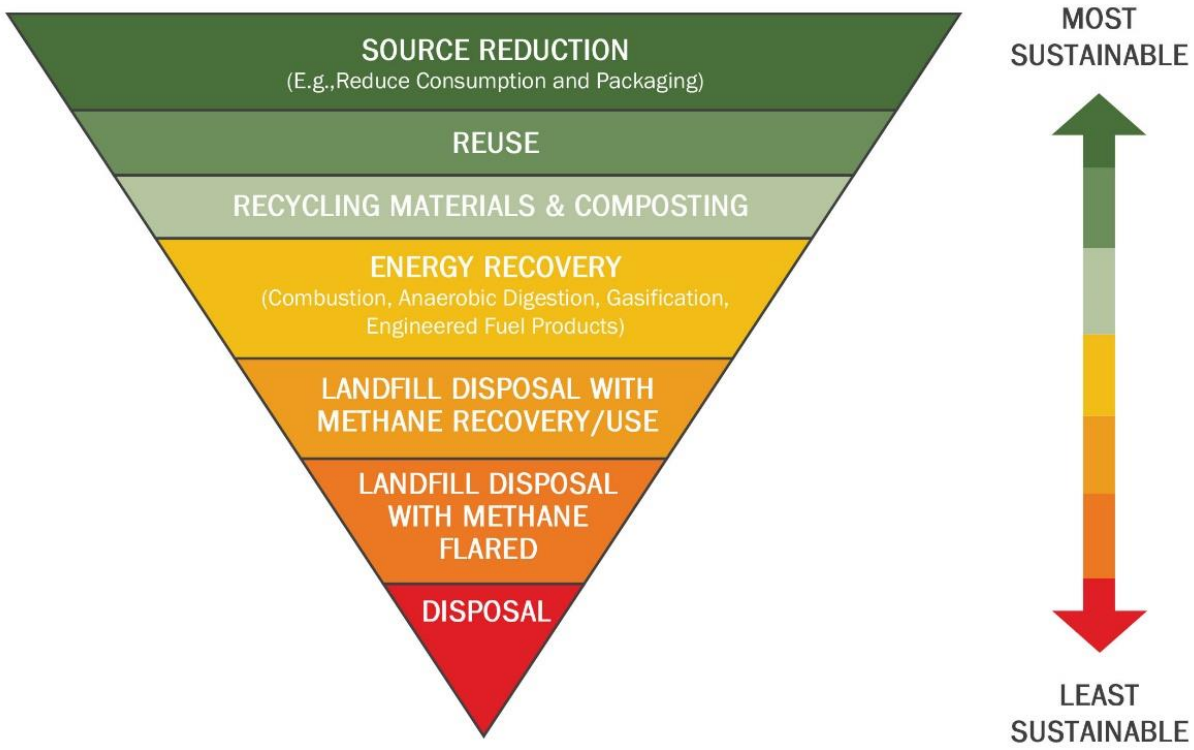
- **Collection:** The collection of municipal waste is performed by the private and public sector. The County, municipalities and private sector waste collectors determine collection methods and containers used at the collection point. County and municipal ordinances, along with Act 101 of 1988 and other solid waste regulations and market conditions influence municipal waste collection and service levels.
- **Transportation:** The transportation of municipal and residual waste generated in Pennsylvania to processing or disposal facilities is regulated by PADEP and the Pennsylvania Department of Transportation (PennDOT) under the Waste Transportation Safety Act (Act 90). Waste haulers, including companies who transport construction and demolition (C&D) wastes, roofing material, landscape wastes, and companies transporting significant quantities of materials form manufacturing operations are subject to regulation.
- **Processing/Disposal:** Public and private operators of municipal waste transfer, processing and disposal facilities in Pennsylvania must have permits from PADEP to build, operate, expand, and close

[1] Referred to as the Solid Waste *and Recycling* Advisory Committee (SWRAC) in Philadelphia.

facilities. Landfills, waste-to-energy facilities, compost facilities and recyclables processors require permits. Pennsylvania counties and local municipalities are required to direct waste to permitted disposal or processing facilities.

The U.S. EPA, PADEP, and Commonwealth Court support an integrated approach where waste reduction and avoided costs are prioritized. This approach is illustrated in Figure I-1 below, which shows the U.S. EPA's Solid Waste Management Hierarchy.

Figure I-1 U.S. EPA Solid Waste Management Hierarchy



The City of Philadelphia manages municipal waste and recyclables following the hierarchy of management and best practices presented below to the extent feasible:

- **Source Reduction:** Avoiding waste through waste elimination and/or reuse practices.
- **Recycling/Composting:** Recovering materials and then processing or converting materials, eventually to new or different products.
- **Avoided Costs:** Source reduction, recycling, and composting can avoid costs and impacts associated with solid waste collection, transportation, and disposal at landfills. In addition to avoided landfill disposal fees, diverting recoverable commodities including appliances, tires, and electronics that are commonly dumped reduces the high costs of clean up after they've been improperly discarded.

The City's role within an integrated waste management system is consistent with PADEP guidelines and Commonwealth Court decisions supporting county involvement in solid waste management as part of protecting public health, safety and welfare and responsibly managing solid waste system costs.

I.4 RELATED CITY GOALS, PLANS AND POLICIES

Philadelphia's MWMP is influenced and supported by additional City action plans which also establish solid waste and recycling related goals and policy recommendations. Specifically, these include:

I.4.1 ZERO WASTE & LITTER ACTION PLAN

Philadelphia Mayor James F. Kenny created the City's Zero Waste and Litter Action Plan through Executive Order in December 2016. The plan establishes a goal of Zero Waste to be achieved by 2035, and created a Zero Waste and Litter Cabinet to guide programs and report on progress. A primary focus of the Zero Waste and Litter Cabinet, as well as the City's Solid Waste and Recycling Advisory Committee (SWRAC) has been collecting baseline data and developing new metrics to help move Philadelphia towards a its Zero Waste and litter-free goals. Details about these metrics are available in the Zero Waste and Litter Cabinet Action Plan (see Appendix A) and annual progress reports.

I.4.2 PHILADELPHIA GREEN WORKS PLAN & UPDATE

Greenworks Philadelphia was initially launched in 2009 and served as the City's first comprehensive and cross-departmental sustainability plan. Greenworks Philadelphia had a six-year implementation timeline (through 2015) with goals that strive to provide benefits to the City and its citizens beyond 2015.

Greenworks Philadelphia addresses sustainability through five goal areas:

- Energy – Reduce the City's vulnerability to rising energy prices.
- Environment – Reduce the City's environmental footprint.
- Equity – Deliver more equitable access to healthy neighborhoods.
- Economy – Create a competitive advantage from sustainability.
- Engagement – Unite to build a sustainable future.

During the development and implementation of the initial Greenworks plan, the City took numerous steps to expand residential recycling services and to expand recycling to outdoor spaces and for special events. Specific initiatives included:

  - Transition to single-stream recycling and weekly recycling collections.
  - Implementation of the City's Recycling Rewards Program.
  - Addition of program recyclables such as #3 - #7 plastics, cartons and aseptic packaging to curbside collection.
  - Recycling program rebranding, as needed, to promote smarter and more successful recycling efforts City-wide.
  - Anti-littering campaigns with rebranding, as needed, to maintain effectiveness.
  - Expansion of leaf collection practices, including increasing the number of seasonal collection sites and re-establishing mechanical leaf collection in certain parts of the City in the fall of 2015.
  - Continued expansion of the Philly Spring Cleanup which now involves over 500 community organizations.
  - Deployment and maintenance of a network of more than 1,000 BigBelly solar compactor units throughout the City.
  - Solid waste contracts that have allowed the City to minimize the amount of municipal solid waste collected by the City that will be landfilled. These contracts utilize waste to energy (WTE) facilities and innovative waste processing technologies such as the SpecFUEL™ facility.
  - The City has also pursued and continues to examine the feasibility of expanded organics diversion through pilot programs and studies.
- The Philadelphia Food Policy Advisory Council (FPAC) was also established during the initial run of Greenworks, and has helped promote and drive food waste reduction initiatives and policy recommendations.

A key measurable goal that emerged from Greenworks was for the City to divert 70 percent of solid waste from landfill disposal. This targeted encompassed all waste generating sectors (residential, commercial and

institutional, and construction and demolition debris) and was first exceeded in 2010. Indeed, 100 percent of residential and illegal dump solid wastes collected by the Streets Department, are either recycled, used as an engineered fuel product (SPEC Fuel), or delivered to a waste-to-energy facility.

In 2016, the Office of Sustainability released an updated plan titled Greenworks: A vision for a sustainable Philadelphia that continues to guide long-term sustainability goals and policies. Solid waste and recycling related goals are rolled up into **Greenworks Vision 7: Zero Waste**, and include the following:

- A new litter index and better cross-departmental coordination to reduce litter.
- Municipal building waste audits designed to educate City building managers on opportunities to divert waste from disposal.
- Zero waste events, which includes a revision to the City's events permits to require recycling and promote options for zero waste.
- Expanded utilization of composting operations at Fairmount Park.
- Expanded hours at the City's sanitation convenience centers.
- A revised solid waste characterization study.
- Enhanced public outreach on proper recycling techniques.
- Upgraded and expanded coverage of the City's BigBelly public space litter and recycling containers.

I.5 STAKEHOLDER ENGAGEMENT

I.5.1 SOLID WASTE AND RECYCLING ADVISORY COMMITTEE

Updating this plan required engagement from among many City stakeholders to shape the planning process and help identify challenges, priorities, goals and strategies to maintain a sustainable solid waste management system. The primary stakeholder vehicle in this process in the City's Solid Waste and Recycling Advisory Committee, or "SWRAC".

Philadelphia's SWRAC was first established as the Solid Waste Advisory Committee in December 1988. The City followed this with the creation of a Recycling Advisory Committee. These two committees were consolidated as part of Mayoral Executive Order 15-08 in 2008. The 2008 consolidation also established guidelines for SWRAC membership by requiring representation from various stakeholder organizations, private industry, and City institutions.

Unlike other Pennsylvania counties, Philadelphia's SWRAC, is a permanent body. The current iteration of the SWRAC was first appointed in 2013 for the purpose of preparing the 2017-2026 plan update. That SWRAC has continued to meet regularly (typically every-other month) and has provided input on the 2019-2028 plan. Chapter 13 of this plan identifies SWRAC members and includes information on SWRAC participation between 2013 through the 2019-2028 plan submittal.

I.5.2 ZERO WASTE AND LITTER CABINET

In December 2016, the Mayor signed Executive Order 13-16 creating the Zero Waste and Litter Cabinet to move the City toward its Zero Waste and litter-free goals. The Cabinet released an action plan on August 7, 2017 with recommendations to enhance the cleanliness of streets and public spaces, and guide progress toward a goal of Zero Waste entering landfills or conventional incinerators by 2035. A copy of the action plan is provided in Appendix A. The Cabinet has five subcommittees:

1. Waste Reduction and Diversion
2. Litter Enforcement and Cleaner Public Spaces
3. Data
4. Behavioral Science

5. Communications and Engagement

The Zero Waste and Litter Cabinet has been instrumental in conducting research and experiments, analyzing program performance, and developing tools, resources, and education materials and platforms (e.g., City-wide Litter Index, the CleanPHL website) to engage stakeholders and to enhance waste measurement and diversion by the City.

I.6 BENEFITS OF PLAN

The City's initial Municipal Waste Management Plan and the subsequent adopted plan revisions, inclusive of this 2019-2028 plan revision, provide an organized framework for the City to plan for and implement a sustainable solid waste management system that is consistent with applicable policies, regulations, and industry practices. Some of the key benefits of the Plan to the City and its citizens and businesses are summarized below.

- The plan provides for documentation regarding waste generation and management practices, including recycling programs, providing a framework for the City to make ongoing planning decisions and to effectively implement appropriate practices.
- The plan addresses and incorporates long-term, cost-effective waste management and recycling strategies that provide for handling, transportation and disposal at permitted facilities with adequate capacity to meet the needs of the City.
- The plan incorporates programs, initiatives and strategies aimed at continuously maintaining or improving waste and recycling management practices, such as the City's anti-litter campaign and public space/public event recycling programs, providing City-wide benefits to public health and safety.
- The plan provides for increased public awareness and participation, providing citizens and businesses opportunities to build upon the sustainability goals of Greenworks Philadelphia and continue to serve as good environmental stewards of the City.

I.7 MAJOR COMPONENTS OF THE 2019-2028 PLAN REVISION

As a Non-Substantial Revision, the City's 2019-2028 Plan update will primarily serve as an update to initiatives, programs and contracts as outlined in Plan draft submitted for the 2017-2026 planning period. The combination of contractually secured disposal and processing capacity for City-collected municipal waste and regional capacity available for privately-collected municipal waste ensures capacity for all City-generated MSW for the 10-year planning period. More specifically, this plan update will address:

- Updates to solid waste generation, disposal and recycling tonnages (through calendar year 2018)
- Updates to the City's bio-solids management programs;
- The City's new solid waste disposal contracts;
- The City's new contract for recyclables processing;
- Updates to the City's residential waste composition;
- Updates on the City's Zero Waste and Litter plan and Greenworks initiatives;
- Updates on the City's recycling and waste reduction public outreach programs;
- Updated meeting records from the City's SWRAC.

CHAPTER 1– DESCRIPTION OF WASTE

1.1 INTRODUCTION

In Pennsylvania, waste originating from residential, commercial, municipal, and institutional establishments, construction and demolition (C&D) activities, medical waste from health care facilities, ash residue, asbestos, and sewage sludge are categorized as "municipal waste". "Municipal Solid Waste" is the waste generated within the City of Philadelphia by residences, retail and commercial establishments, municipal and institutional establishments, and from community events. Other municipal waste types include construction and demolition waste, infectious and chemotherapeutic waste, household hazardous waste, tires, ash, and biosolids. This Chapter describes the origins, contents, and quantities of municipal wastes generated by the City of Philadelphia.

1.2 CITY LOCATION, DEMOGRAPHICS AND HISTORY

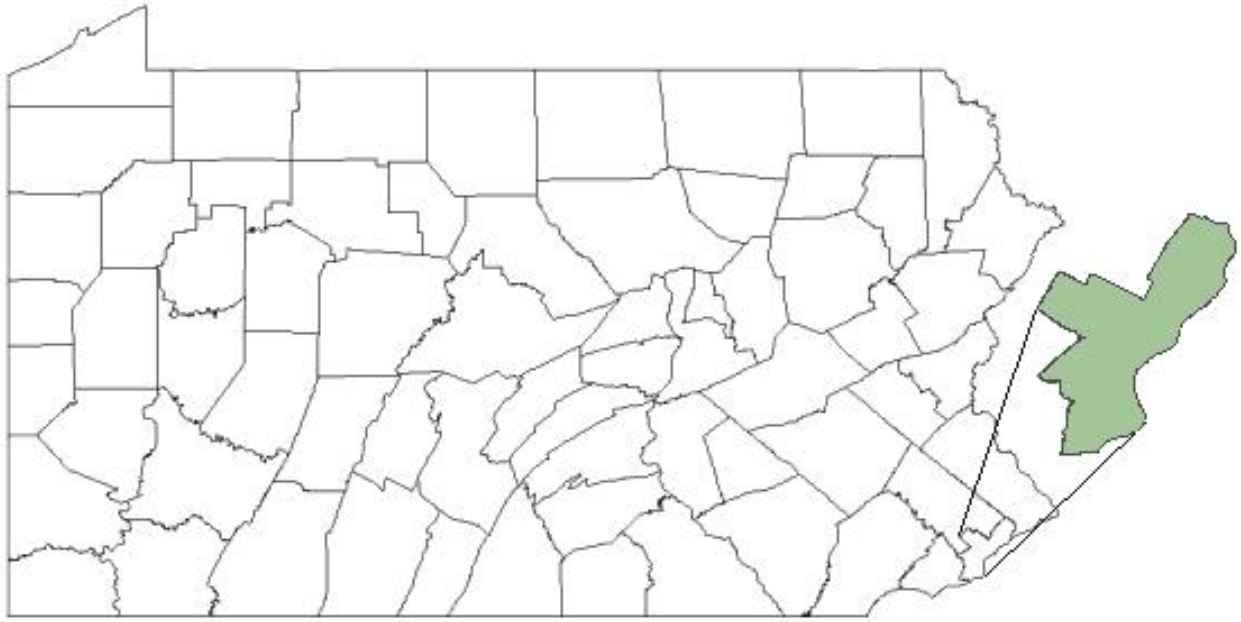
1.2.1 OVERVIEW

The City of Philadelphia is located in southeastern Pennsylvania, generally bordered to the northeast by Bucks County, to the west and northwest by Montgomery County, and to the southwest by Delaware County. The City's geographic boundaries are shown below in Figure 1-1. The Delaware River runs along the eastern and southern boundary separating the City from the State of New Jersey. While it is considered a consolidated city-county, the two entities have been coterminous since 1854, with the city performing all county government functions since 1952.

Philadelphia is the largest city in Pennsylvania and according to the U.S. Census Bureau's 2018 estimates is the sixth most populous city in the United States, with a population of some 1.584 million people. It has a land area of approximately 134 square miles, and a population density of approximately 11,813 persons per square mile. Philadelphia's population peaked at more than 2 million by the early 1950's, but as with many cities of the Northeast, a decades-long period of de-industrialization resulted in closed factories, job and population loss. Yet by 2010 the City's population loss had reversed, driven by reinvestment, economic diversification, and the sense that political reforms were taking place. The City's population has grown from approximately 1.526 million as of the 2010 U.S. Census to 1.584 million in 2018, a net increase of some 58,000 residents and growth rate of 3.8 percent.

The City of Philadelphia consists of numerous neighborhoods and other political, planning and service districts that encompass those neighborhoods. For purposes of waste collection and management, the City is divided into six service areas that are further subdivided into thirteen Sanitation Collection Districts.

Figure 1-1 City of Philadelphia Boundaries



From the time of its founding in the late 17th century, Philadelphia's growth has been shaped by innovative and thoughtful planning to make the most of its location, urban form, and access to resources. As the heart of a new nation, Philadelphia's port on the Delaware River was a center of commerce. In the early 19th century, the port was augmented by railroads that fed Philadelphia with raw materials for manufacture and distribution making it, for a time, the "Workshop of the World." In the mid-20th century the construction of interstate highways and an international airport increased the flow of goods and access to and from the City. By this time a rich transit network, including high-speed subways and elevated trains, commuter rail, buses, and trolleys was in place.

Today the city is the sum of its many assets – a strong metropolitan center, the engine of business/institutional/cultural output and employment; a fabric of diverse and authentic neighborhoods; and industrial-legacy areas ripe for a mix of new uses, all of which are supported by a dynamic foundation of transportation resources: highways, freight and passenger rail, public transit, seaports, and airports.

1.2.2 REGIONAL CONTEXT

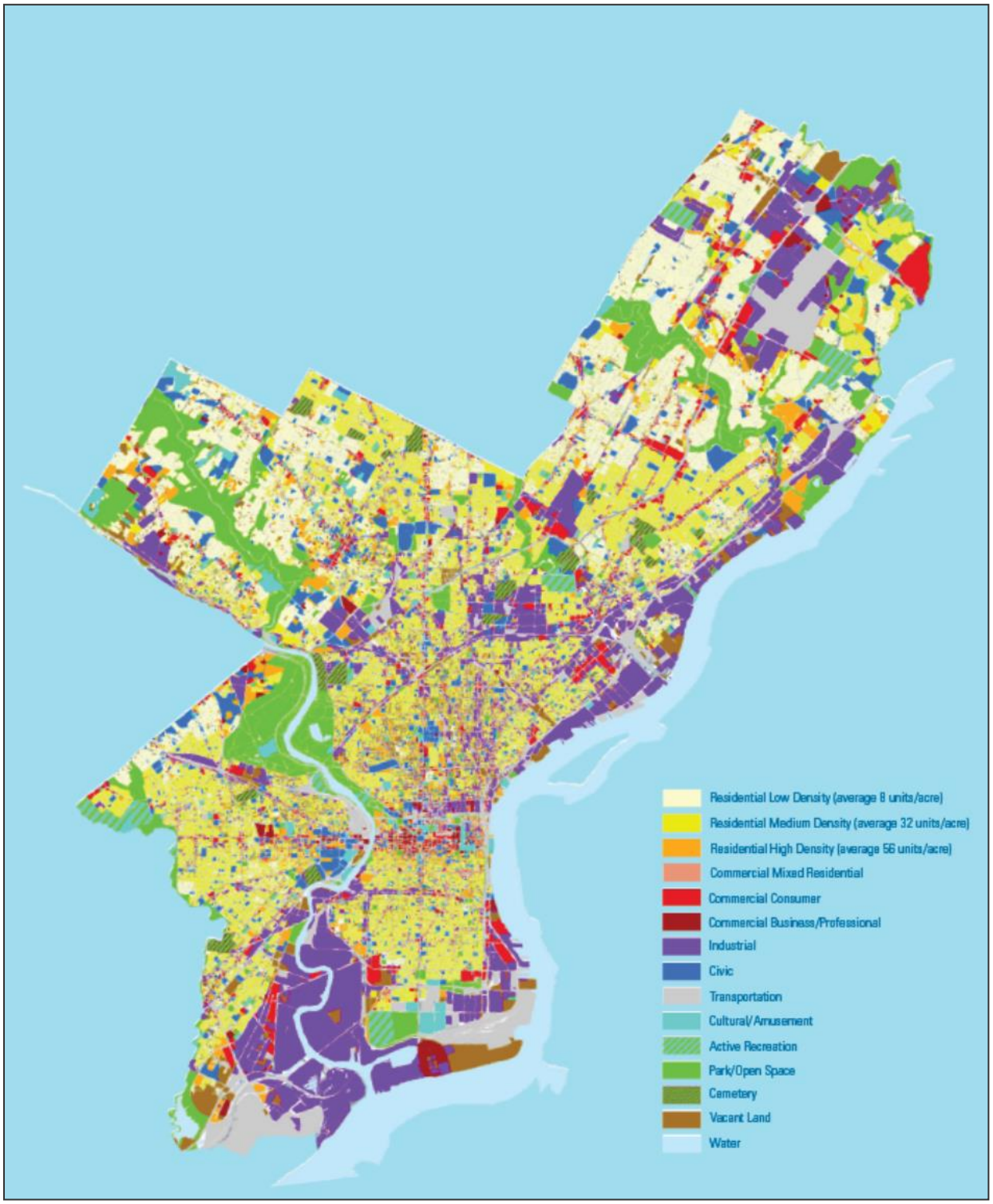
Philadelphia is the urban center of a four-state "Greater Philadelphia" region comprised of 12 counties in the Metropolitan Statistical Areas (MSA) of Philadelphia-Camden-Wilmington, PA-NJ-DE-MD, and Trenton-Ewing, NJ, as defined by the U.S. Census Bureau. Greater Philadelphia is projected to grow from its 2010 population of 6.3 million to about 7.0 million people between by 2035. Philadelphia is also the geographic hub of an "extended region" including Greater Philadelphia and 11 counties connected by proximity, trade, and culture. The population of this extended region is expected to increase from approximately 9.4 million to nearly 10.7 million residents over the next 25 years. At a larger scale, Philadelphia is centrally situated along the Northeast Megaregion corridor that extends from Southern Maine to Northern Virginia that estimated to grow to 60 million people by 2035.

Moreover, because of its population base and commerce base, more solid waste is generated in Philadelphia than any other jurisdiction in the commonwealth. While this can create unique challenges, Philadelphia's size and scale also gives it considerable influence over solid waste markets. Indeed, some of the facilities that process solid waste and recyclables generated in and around Philadelphia, are among the most technologically advanced in the U.S.

1.2.3 ENVIRONMENT

Philadelphia's location and development history strongly influence the City's environment. Direct access to both the Delaware and Schuylkill Rivers provides Philadelphia with a generally reliable quantity of water, yet extensive investment in treatment and watershed management is required to protect the quality of the City's drinking water from point and non-point pollution throughout the expansive drainage areas. Greater Philadelphia has a balanced, four-season climate. However, the quality of the region's air is harmed by contaminants transported into the area by prevailing winds and by the region's excessive consumption of fossil fuels during hot and cold weather. One of the City's major environmental legacies is a large amount of vacant land resulting from previous deindustrialization and population loss. The highest and best reuse of this vacant land is often complicated by soil instability due to previous fill of stream beds or waterfronts, or by soil contamination linked to previous industrial uses or construction practices. Figure 1-2 shows land use in the City as recorded in 2010.

Figure 1-2 City of Philadelphia Land Use Map (2010)



Source: Philadelphia City Planning Commission (2010)

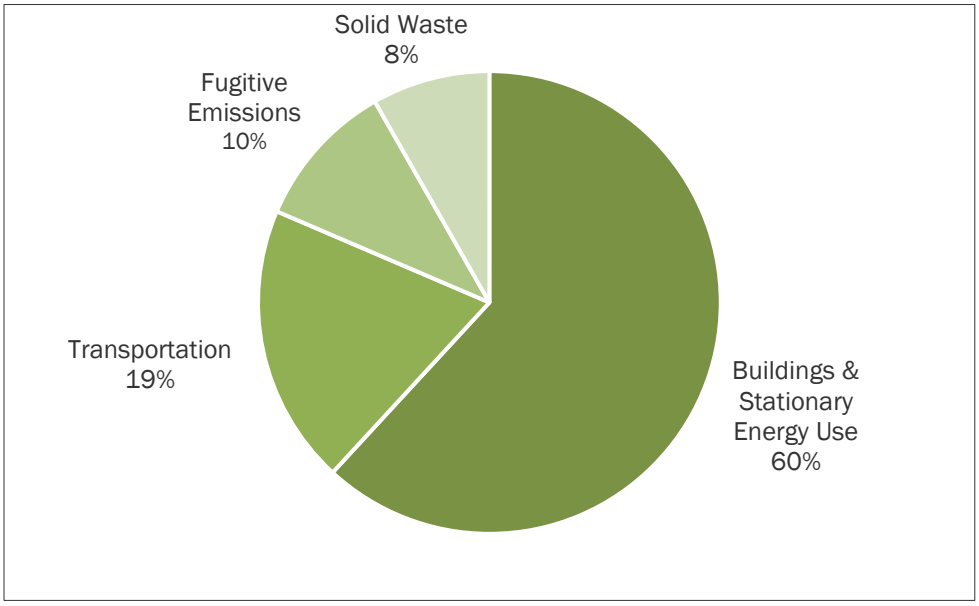
1.2.4 EMISSIONS

Philadelphia and its public and private partners continue to make progress toward compliance with increasingly stringent standards for environmental performance and mitigation of natural hazards. Since the 1970's, the quality of the City's air and water show marked improvement due to decades of conscientious environmental stewardship, investment, and significant reductions in heavy industrial activity. For example, public and nonprofit partners, such as the Philadelphia Air Management Services and the Delaware Valley Regional Planning Commission (DVRPC), are working towards U.S. Environmental Protection Agency (US EPA) air-quality standards for ground-level ozone and fine particulate matter, and the City is pioneering an integrated "green infrastructure" approach to help reach compliance with US EPA regulations for combined-sewer overflows. In conjunction with these and other efforts, Philadelphia and its partners are implementing strategies to aggressively reduce total and per-capita greenhouse gas (GHG) emissions attributable to the City and region. Additionally, the City is updating assessments of risks from flooding, extreme temperatures, high winds, and soil instability.

The City's people, buildings, infrastructure, and natural areas are vulnerable to environmental changes associated with long-term climate change. An estimated rise in sea level of one meter by the year 2100 places homes, businesses, and facilities in Philadelphia tidal areas at greater risk for regular tidal inundation and periodic flooding. Sea-level rise also poses challenges to the ecologies of tidal wetlands and the salt line on the Delaware River. Forecasts based on low and high GHG emission scenarios estimate increases of between 3°F and 14°F in average Pennsylvania temperatures toward the end of this century. In Philadelphia, prolonged excessive heat poses particular risks for vulnerable populations, transportation and utility systems, energy budgets, and activities that traditionally take place outdoors in warm weather months.

Citywide, GHG emissions decreased by 9% between 2006 and 2012. Reducing energy consumption in buildings was the leading contributor to this decrease. As shown in Figure 1-3 below shows the GHG emissions by sector based on the City's 2012 inventory. Between 2006 and 2013, GHG emissions from City government sources have declined nearly ten percent to approximately 500,000 metric tons of CO2-equivalent (MtCO2e). The largest sector for carbon emissions in the municipal inventory are buildings owned and operated by the City of Philadelphia.

Figure 1-3 Philadelphia GHG Emissions by Sector



Source: Philadelphia Energy Office and Office of Sustainability (2015)

1.3 MUNICIPAL SOLID WASTE (MSW)

1.3.1 OVERVIEW

"Municipal solid waste" (MSW) refers to routinely generated conventional garbage and source-separated recyclables generated by households, businesses, and institutions. MSW does not include other municipal wastes such as construction and demolition (C&D) debris, sewage sludge, or asbestos.

Permitted landfills, transfer stations, and waste to energy facilities are required to report quantities of waste received by county of origin to the Pennsylvania Department of Environmental Protection (PADEP). Philadelphia is required under Act 101 to report recycled material quantities annually to PADEP and to document historic MSW quantities in its Municipal Waste Management Plan. The, generation data detailed in this plan has been obtained from various reporting sources as follows:

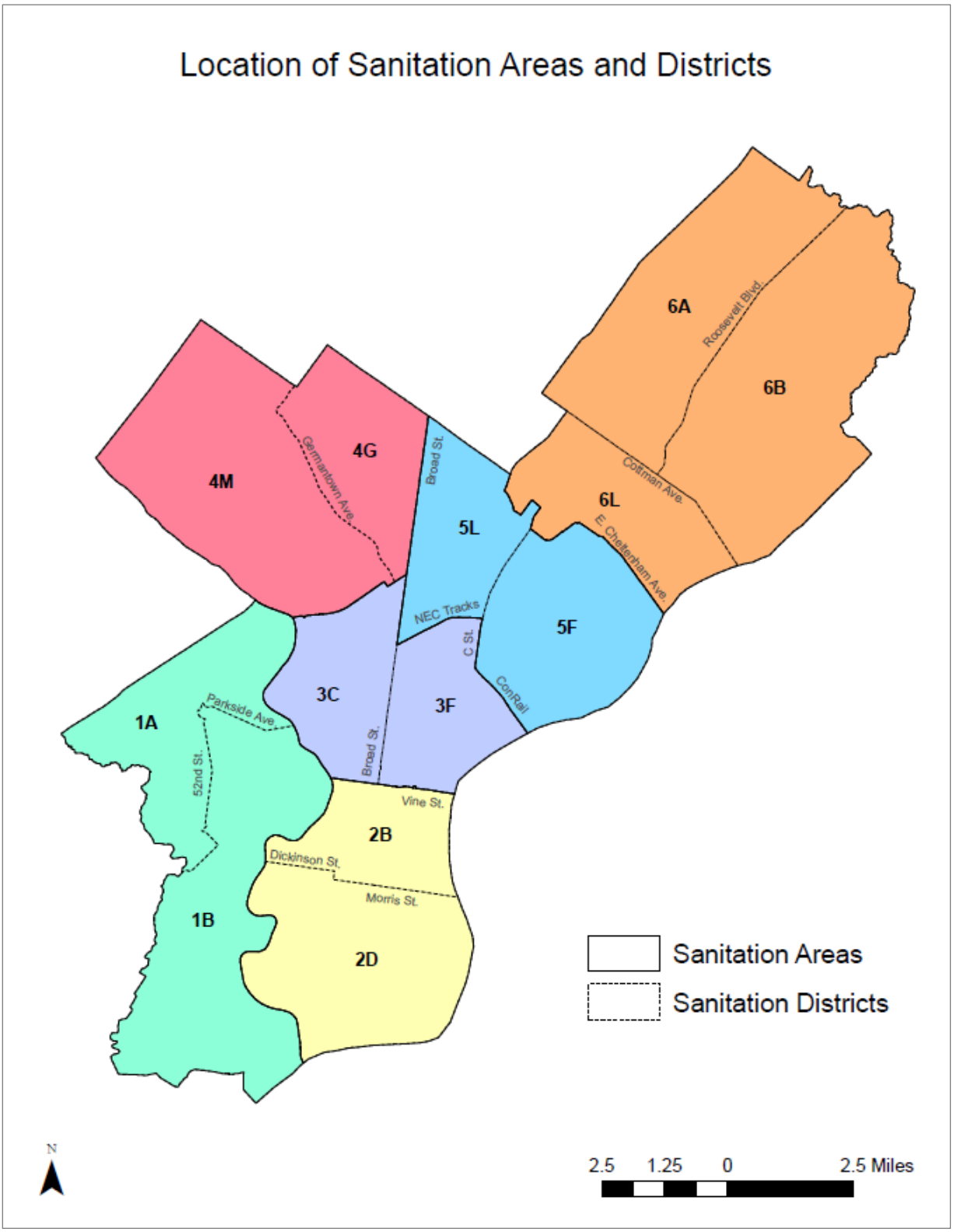
- Residential trash and recyclables tonnages are reported by the City's Streets Department.
- Commercial and institutional disposal tonnages are obtained by reviewing statistics from Pennsylvania landfills and waste-to-energy facilities.
- Commercial and institutional recyclables, including C&D debris, and organics, are reported to the City annually by the establishments or by commercial haulers and recyclables processors who aggregate tonnages from their various customers, and submitted to the PADEP by the City in accordance with the Annual Recycling Report requirements.

1.3.2 GENERATING SECTORS

1.3.2.1 Residential

Residential waste managed by the City's Department of Streets includes MSW generated by single-family dwellings and multi-family dwellings of six units or less. Approximately 540,000 residential units are currently served by the Streets Department, with collections organized into six sanitation areas with 13 districts. Under certain conditions, including upon application to the Streets Department and subject to recycling requirements, residential condominiums and cooperatives larger than six units may be eligible for City collection. A map of the City's residential sanitation areas and districts is show below as Figure 1-4.

Figure 1-4 Sanitation Areas and Districts



Source: Philadelphia Streets Department

1.3.2.2 Commercial and Institutional

Most commercial establishments in the City are served by private waste haulers. The City regulates commercial waste collections through ordinances and other published regulations. Philadelphia has an open-market system for commercial and institutional waste, meaning that generators are required to contract directly with private haulers for collection and disposal services. For 2018, the City estimates that approximately 72 percent of municipal solid waste generated within Philadelphia originated from commercial sources. This total is consistent with other large cities in the U.S.

Certain small businesses are eligible for City collection based on quantity, frequency and type of waste. To be eligible, businesses must not set out more than six containers or 12 bags of trash per collection; the establishment must not require collection frequency more than once a week; and the location must not receive private hauler service in any form. Small commercial establishments that qualify for City collection are assessed an annual fee for trash and recycling collections. Additionally, the Streets Department provides collections for City buildings located along residential collection routes such as Recreation, Police and Fire Department facilities, and for about 35 larger City administrative buildings. Most collection services provided by the City are provided on a weekly basis.

1.3.3 DISPOSED MSW

For calendar year 2018, the City disposed of nearly 1.3 million tons of MSW from both the residential and commercial sectors. Despite an uptick in 2018, disposal tonnages have fallen by 29 percent since 2007. While disposal tonnages have certainly been influenced by overall waste generation trends as referenced in Section 1.3.3, increased access and participation in recycling efforts at both the residential and commercial levels have had significant impacts as well. Table 1-1 below presents disposed MSW from residential and commercial generators from 2007 through 2018.

Table 1-1 Quantity of Disposed Municipal Solid Waste (2007-2018) [1]

Year	Residential MSW Disposed (tons)	Commercial MSW Disposed (tons)	Total MSW Disposed (tons)
2007	641,724	1,185,701	1,827,425
2008	612,419	1,060,976	1,673,395
2009	559,907	878,928	1,438,835
2010	528,793	866,751	1,395,544
2011	530,779	859,663	1,390,442
2012	520,000	771,072	1,291,072
2013	498,024	818,167	1,316,191
2014	496,754	819,998	1,316,752
2015	459,330	868,974	1,328,304
2016	483,571	746,726	1,230,297
2017	440,901	721,040	1,161,942
2018	491,710	804,133	1,295,843

[1] Based on hauler reports compiled by the City for purpose of reporting data to PADEP. Data may differ from PADEP reports because the City estimates a portion of reported commercial quantities that are delayed or delinquent from private haulers.

1.3.4 COMPOSITION OF DISPOSED WASTE

MSW generated by residential, commercial, and institutional sources is a heterogeneous mixture of discarded items such as packaging and containers, food waste, yard trimmings, durable goods (such as furniture), nondurable goods (such as paper and clothing), and other items. The composition of a specific

waste stream from a defined area (i.e., local, regional or state-wide) can be estimated by performing a waste characterization analysis, which in turn can facilitate more effective waste management planning and program implementation. The City of Philadelphia has performed several characterization studies of its disposed residential MSW, the most recent one in 2017, which is included as Appendix B.

The 2017 study included collection of residential waste samples at a transfer station receiving City-collected MSW and the collection of recyclables samples at a Material Recovery Facility (MRF) receiving City-collected single stream recyclables. Samples were sorted in the winter of 2016 and then summer of 2017 to account for potential seasonality differences and were proportionately collected from across all Sanitation Collection Districts. The results were tabulated to depict the estimated composition of overall waste generated by City residents (before recycling), the composition of waste after recycling, and the composition of recyclables. Table 1-2 below presents the composition of disposed residential MSW based on the City's 2017 waste characterization study and compares it to results from the City's 2010 waste characterization data and the United States Environmental Protection Agency (US EPA) 2017 waste composition estimates with the *Advancing Sustainable Materials Management Fact Sheet* that present characteristics of the waste stream for the entire U.S.

Table 1-2 Waste Characterization Data [1]

Material	Philadelphia Residential Waste Composition Study (2017) By Percent	Philadelphia Residential Waste Composition Study (2010) By Percent	U.S. EPA Advancing SMM Facts & Figures (2017) By Percent
Paper & Paperboard	14.2%	14.7%	13.2%
Plastic	11.2%	10.1%	18.7%
Glass	2.2%	2.0%	4.8%
Metals	3.1%	3.4%	9.6%
Food Waste	16.7%	10.8%	21.9%
Yard Trimmings	13.0%	11.5%	6.2%
Rubber/Leather	0.9%	1.3%	4.3%
Textiles	6.3%	6.2%	8.2%
Wood [2]	8.1%	7.4%	8.6%
Misc. Inorganics [3]	9.8%	12.5%	2.3%
Other Wastes [4]	14.5%	21.1%	2.1%
Total	**100.0%**	**100.0%**	**100.0%**

[1] Percent by weight of materials discarded (after recycling). Totals may not add to 100% due to rounding.
[2] Includes clean wood and painted/stained/treated wood for City data, and non-C&D wood such as pallets and other wood packaging for U.S. EPA data.
[3] Includes dirt/fines for both data sets and block/brick/stone for the City data set (U.S. EPA data excludes C&D).
[4] The composition of "Other Wastes" varies for the two data sets, but generally includes materials such as carpet/padding, diapers/sanitary products, bulky items, electronics, tires, and other materials.

For planning purposes, the City's data is considered more representative of local conditions for residential waste. However, the U.S. EPA data does provide insights into national materials generation trends and can be useful when examining the possible composition of waste from the commercial and institutional sectors. Together, these data sets are indicative of the content of municipal solid waste addressed under this Plan.

1.3.5 RECYCLED MSW

Recyclables collected from Philadelphia residents increased significantly after expanded curbside recycling during the City's FY 2008. These program changes included the City-wide implementation of single-stream recycling, weekly collections, introduced the recycling rewards program, and the addition of program materials including #1, #2, #3-7 plastics. Increased enforcement of the City's mandatory recycling requirements and a series of public outreach campaigns that rebranded the program also increased public awareness and participation.

Recycling tonnages are reported to the City's Streets Department on an annual basis. While businesses are required to report the data, obtaining it in a timely and accurate manner can be challenging. There are also frequent gaps in the data collected that require administrative time by Streets Department staff to research and seek clarity on.

While commercial recycling is also influenced by access to programs, adding recyclables to programs, and employee awareness, it can also be impacted by overall economic trends. For example, when recovered materials market prices for corrugated cardboard are high, businesses have more incentive to target those materials and ensure they are recovered through their internal waste management practices.

Table 1-3 below presents MSW recycling tonnages from residential and commercial sources from 2007 through 2018. Additional information and analysis on City recycling programs and initiatives will be provided in Chapter 4 of this plan document.

Table 1-3 Quantity of Recycled Municipal Solid Waste (2007 – 2018) [1]

Year	Residential MSW Recycled (tons)	Commercial MSW Recycled (tons) [2]	Total MSW Recycled (tons)
2007	49,243	764,040	813,283
2008	54,992	834,139	889,131
2009	74,797	764,119	838,916
2010	90,475	915,603	1,006,078
2011	105,248	973,635	1,078,883
2012	122,680	841,636	964,316
2013	126,263	717,692	843,955
2014	126,720	681,551	808,271
2015	116,553	801,795	918,348
2016	118,367	828,676	947,043
2017	129,620	815,810	945,430
2018	126,802	798,075	924,877

[1] Based on hauler reports compiled by the City for purpose of reporting data to PADEP. Data may differ somewhat from PADEP reports due to the City's need to estimate certain commercial data that is not reported in a timely way by some private haulers and/or that is incomplete.
[2] A portion of the commercial recycling quantities for 2015 through 2018 are estimated values based on data reported by private entities and adjusted by the City using representative data from 2011 through 2014 to account for non-reported, or under-reported materials.

1.3.6 GROSS MSW GENERATION

During 2018, an estimated 2.2 million tons of municipal solid waste was generated by residential properties, commercial businesses, and institutions such as colleges and universities. Table 1-4 below details gross municipal solid waste generation, including disposed and recycled materials, from all waste generating sectors in Philadelphia from 2007 through 2018.

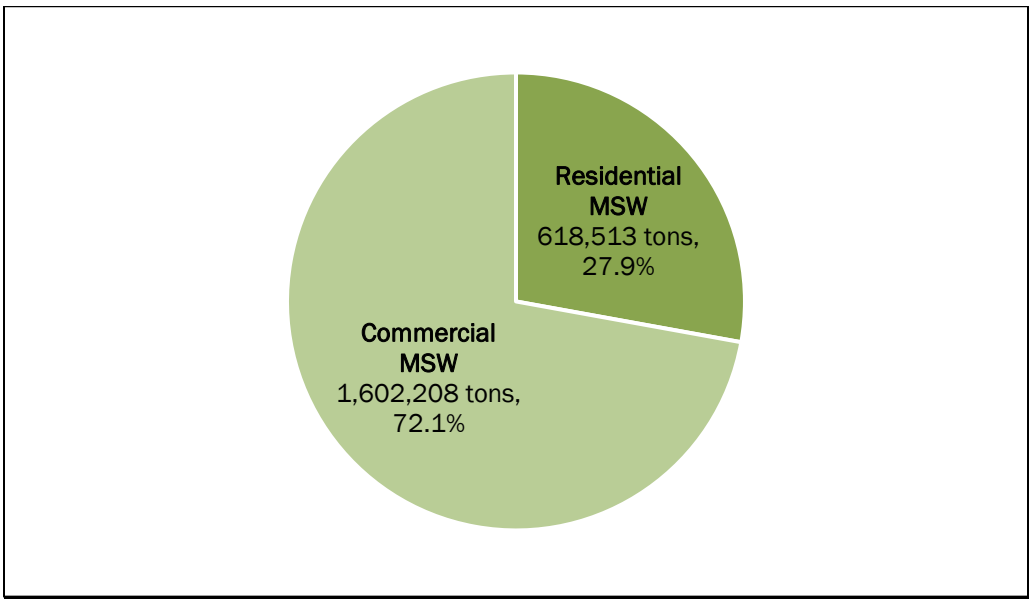
Table 1-4 Quantity of Gross Municipal Solid Waste Generated (2007 – 2018) [1]

Year	Gross Residential MSW Generation (tons)	Gross Commercial MSW Generation (tons)	Total Gross MSW Generation (tons)
2007	690,967	1,949,741	2,640,708
2008	667,411	1,895,115	2,562,526
2009	634,704	1,643,047	2,277,751
2010	619,268	1,782,354	2,401,622
2011	636,027	1,833,298	2,469,325
2012	642,680	1,612,708	2,255,388
2013	624,287	1,535,859	2,160,146
2014	623,474	1,501,549	2,125,023
2015	575,883	1,670,769	2,246,652
2016	601,938	1,575,402	2,177,340
2017	570,521	1,536,850	2,107,371
2018	618,513	1,602,208	2,220,720

[1] Gross municipal solid waste includes generated conventional garbage and source-separated recyclables generated by households, businesses, and institutions.

Overall MSW generation in the City of Philadelphia has been relatively level in recent years with annual amounts ranging between 2.1 and 2.3 million tons since 2012. In 2018, 72 percent of MSW was generated by commercial and institutional sources while 28 percent was generated by residential sources, as shown in Figure 1-5.

Figure 1-5 Municipal Solid Waste by Generating Sector (in Tons and by Percent) [1]



[1] Source: See Tables 1-3 and 1-4.

The City's decrease in total MSW generation, even while its population increases, is consistent with national waste generation trends. Changes in packaging design, light weighting of materials, and use of digital media has resulted in a significant decrease in material density and paper generation.

For 2018, it is estimated that 41.6 percent of MSW generated in the City was recycled or composted, and the remainder was disposed at a combination of landfill and waste to energy facilities (see Chapter 2 of this Plan). This does not include recycled C&D debris. Table 1-5 below summarizes the quantity of MSW generated, recycled, and disposed in 2018.

Table 1-5 Quantities of MSW Generated, Recycled and Disposed (2018)

Parameter	Residential	Commercial	Total
Recycled MSW (tons) [1]	126,802	798,075	**924,877**
Disposed MSW (tons) [2]	491,710	804,133	**1,295,843**
Generated MSW (tons)	**618,512**	**1,602,208**	**2,220,720**
Diversion Rate [3]	20.5%	49.8%	**41.6%**
% of Generation	27.9%	72.1%	**100.0%**

[1] Source: See Table 1-3.
[2] Source: See Table 1-4.
[3] Does not include C&D.

As with the City's residential solid waste composition, it also can be informative to compare this data to the most recent data collected by the U.S. EPA, as reported in *Advancing Sustainable Materials Management: 2017 Fact Sheet*. The U.S. EPA reports that the overall MSW recycling rate in the United States for 2017 was approximately 35.2 percent. The City's most recently-reported MSW recycling rate for residential and commercial waste is estimated at 41.6 percent, which is higher than the national average.

1.4 OTHER MUNICIPAL WASTES

Article VIII of Title 25 (Environmental Protection) of the PA Code specifies requirements for municipal waste processing, disposal, transportation, collection, and storage. The following types of waste are addressed in this Chapter: infectious and chemotherapeutic waste, construction and demolition waste, household hazardous waste, tires, ash from resource recovery facilities, and biosolids.

1.4.1 CONSTRUCTION AND DEMOLITION WASTE

Construction and demolition (C&D) waste is municipal waste resulting from the construction, reconstruction, renovation, and demolition of buildings and other structures, including, but not limited to, wood, plaster, metals, asphalt, bricks, block and unsegregated concrete. According to data published by PADEP, approximately 36,971 tons of C&D waste from Philadelphia was disposed of at 11 locations in 2018, as shown in Table 1-6. In addition, according to City estimates and tonnage reports, commercial haulers and processors serving Philadelphia collected an additional 356,358 tons of C&D waste for recycling in 2018. This represents a total generation of 393,328 tons of C&D waste in 2018 with a recycling rate of approximately 90.6 percent. Both C&D disposal and recovery data is summarized in Table 1-7 below.

Table 1-6 C&D Disposal Facilities and Quantities (2018)

C&D Disposal Facility	Quantity of C&D Waste Disposed (tons)
Fairless Landfill	18,044
Conestoga Landfill	7,988
Rolling Hills Landfill	6,234
Commonwealth Environmental Systems, L.P.	3,310
Chester County Landfill	530
Pioneer Crossing Landfill	315
Modern Landfill	251
Western Berks Community Landfill	136
Wayne Township Landfill	81
IESI Bethlehem Landfill	74
Wheelabrator Falls Resource Recovery Facility	10
Total C&D Waste Disposed	**36,971**

[1] Source: PADEP Bureau of Waste Management, Division of Reporting and Fee Collection (disposal data).
[2] Excludes municipal waste generated by homeowners that is characterized as C&D waste, and that is collected by the City as part of residential municipal waste (e.g., clean wood, painted/stained/treated wood, dirt and fines, block/brick/stone, carpet/padding, and other materials typical of home construction activities).

Table 1-7 Generation, Recycling and Disposal of C&D Waste (2018) [1][2]

Parameter	Quantity of C&D Waste (tons)
Total C&D Waste Disposed	36,971
Reported C&D Waste Recycled [3]	356,358
Total C&D Waste Generated	**393,328**
C&D Waste Recycling Rate	90.6%

[1] Source: PADEP Bureau of Waste Management, Division of Reporting and Fee Collection (disposal data), and City of Philadelphia recycling data.
[2] Excludes municipal waste generated by homeowners that is characterized as C&D waste, and that is collected by the City as part of residential municipal waste (e.g., clean wood, painted/stained/treated wood, dirt and fines, block/brick/stone, carpet/padding, and other materials typical of home construction activities).
[3] Recycling data - particularly C&D and scrap metals - is difficult to obtain consistently from private haulers and processors and should be considered a planning-level estimate.

1.4.2 INFECTIOUS & CHEMOTHERAPEUTIC WASTE

Infectious and Chemotherapeutic Wastes (ICW) are defined as special handling wastes, and fall under the term Regulated Medical Waste (RMW) for consistency with federal regulations. Infectious waste includes waste generated in the diagnosis, treatment, immunization, research, testing or autopsy of human beings or animals, and which falls under one or more of the following categories: cultures and stocks, pathological

waste, human blood and body fluid, animal waste, isolation waste, used sharps. Chemotherapeutic wastes originate from the production or use of antineoplastic agents used for the purpose of inhibiting or stopping the growth of malignant cells or killing malignant cells, and that is not otherwise defined as hazardous waste. Hospitals and large medical facilities are the primary generators of regulated medical wastes. Medical facilities individually arrange for handling, transportation, treatment, and disposal and are regulated by state and federal laws. PADEP licenses and maintains records of active medical waste transporters operating in the Commonwealth.

The City of Philadelphia Department of Public Health operates eight City health centers located in neighborhoods across the City, staffed by doctors, nurses, dentists and other health care providers. The City also has a health laboratory that performs testing services for the Department of Public Health and for selected outside agencies. There are many small to mid-size medical facilities, nursing/residential care facilities, doctors' offices, dental offices, veterinary clinics, funeral homes and medical labs within City limits.

City-generated ICW is disposed of through a variety of methods, including on-site treatment and/or hauling by private contractors to regional, off-site processing and disposal facilities. Based on the 2017 PADEP transporters list, there are 51 licensed ICW transporters. There are five permitted ICW processing facilities, none of which are located in the City of Philadelphia.

According to year 2018 PADEP Division of Reporting and Fee Collection reports, 4,132 tons of ICW were generated within the City of Philadelphia and ultimately disposed of at three permitted facilities. ICW disposal data is summarized in Table 1-8.

Table 1-8 Generation and Disposal of ICW (2018) [1]

Disposal Facility	Quantity of ICW (tons)
Pioneer Crossing Landfill	2,142
Fairless Landfill	1,806
Conestoga Landfill	184
Total ICW	**4,132**

[1] Source: PADEP Bureau of Waste Management, Division of Reporting and Fee Collection.

1.4.3 HOUSEHOLD HAZARDOUS WASTE & ELECTRONIC WASTES

The Southeastern Pennsylvania Counties of Bucks, Chester, Delaware, Montgomery, and City of Philadelphia have worked have partnered to implement a regional household hazardous waste collection program, which features more than 30 drop-off events each year. The partnership allows for residents of each jurisdiction to attend any event in the region.

The goals of the City and regional program are to: 1) provide a safe and moderately convenient disposal service to area residents; 2) increase participation in HHW collections; 3) provide more focused and targeted long term publicity about the safe use and handling of hazardous household products and their associated wastes; 4) provide cost-effective reuse and recycling of HHW; 5) promote source reduction of HHW; and 6) add services for businesses where possible at a later date. Overall, the yearly participation goal is to serve 20,000 to 25,000 households throughout the region.

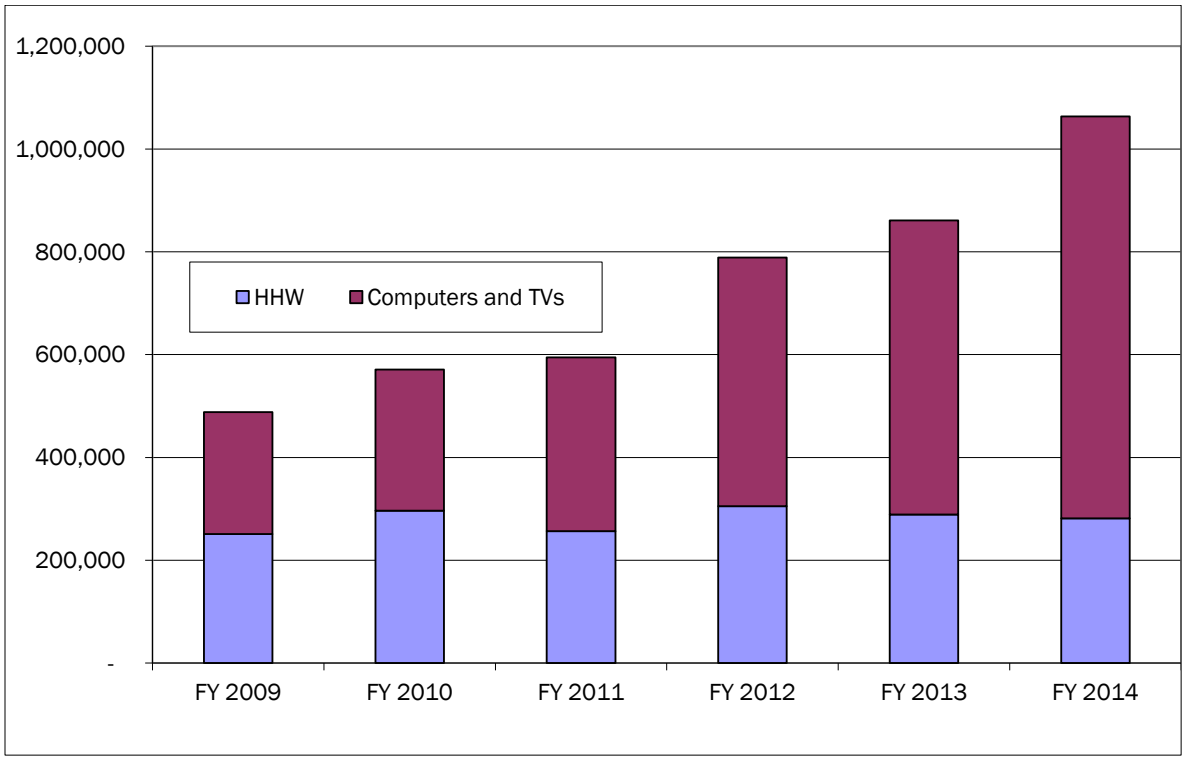
This program was established based upon recommendations made in the report titled, *A Feasibility Analysis of a Household Hazardous Waste System in Southeastern Pennsylvania* prepared by the Waste Watch Center and the Pennsylvania Resources Council in June 1996. The report can be obtained from the Delaware Valley

Regional Planning Commission. This program was implemented in 1998 and the Counties have jointly signed an inter-governmental agreement.

The City began accepting e-waste (including computers and TVs) at HHW events in 2004 and at three Sanitation Convenience Centers in 2008. Currently, the City accepts computers and TVs by drop-off only at all six of the City's Sanitation Convenience Centers. In spring 2015, the City discontinued supplemental e-waste collection at HHW events. These changes to e-waste collection are not expected to significantly impact the amount of e-waste collected in the City, since about 95 percent of e-waste was already collected through the Convenience Centers.

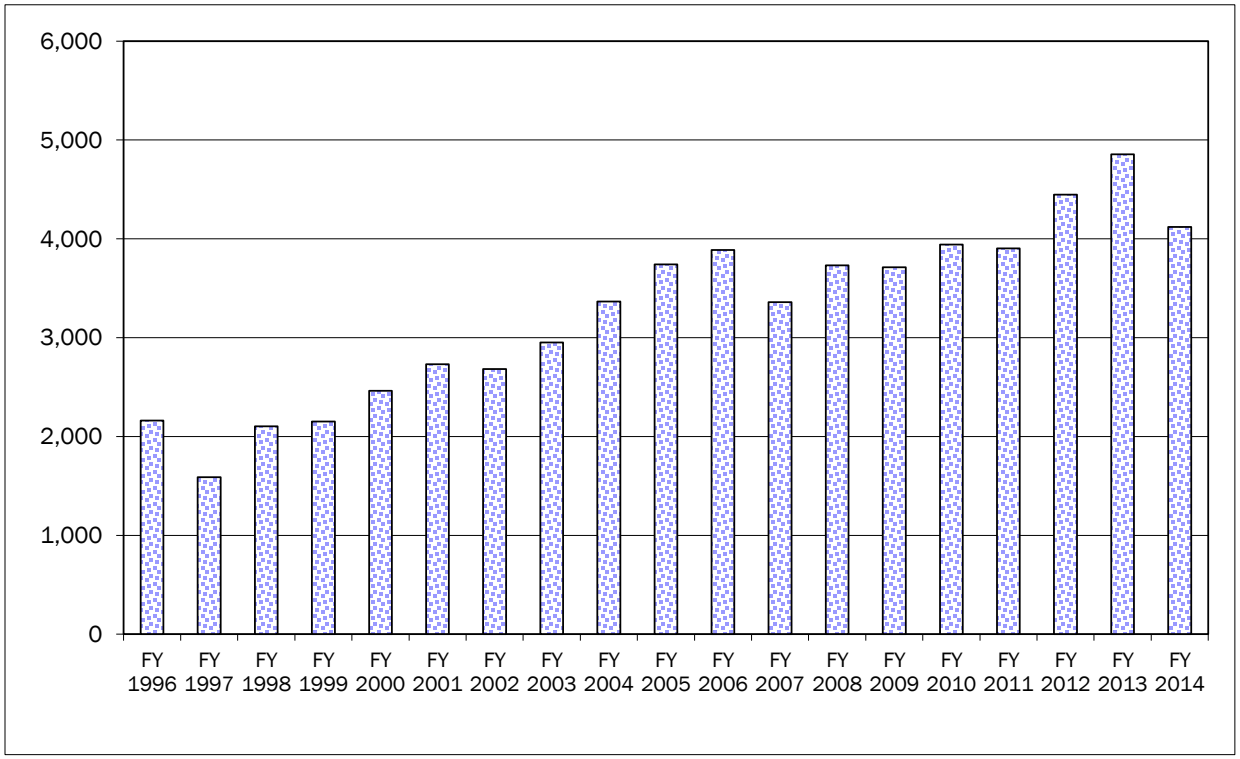
Figure 1-6 presents historical information on the quantity of materials collected while Figure 1-8 presents historical information on participation in the City's HHW program (FY 2009 through FY 2014). Figure 1-8 presents information on the representative composition of HHW collected in Philadelphia.

Figure 1-6 Philadelphia HHW & E-Waste Recovery Trends



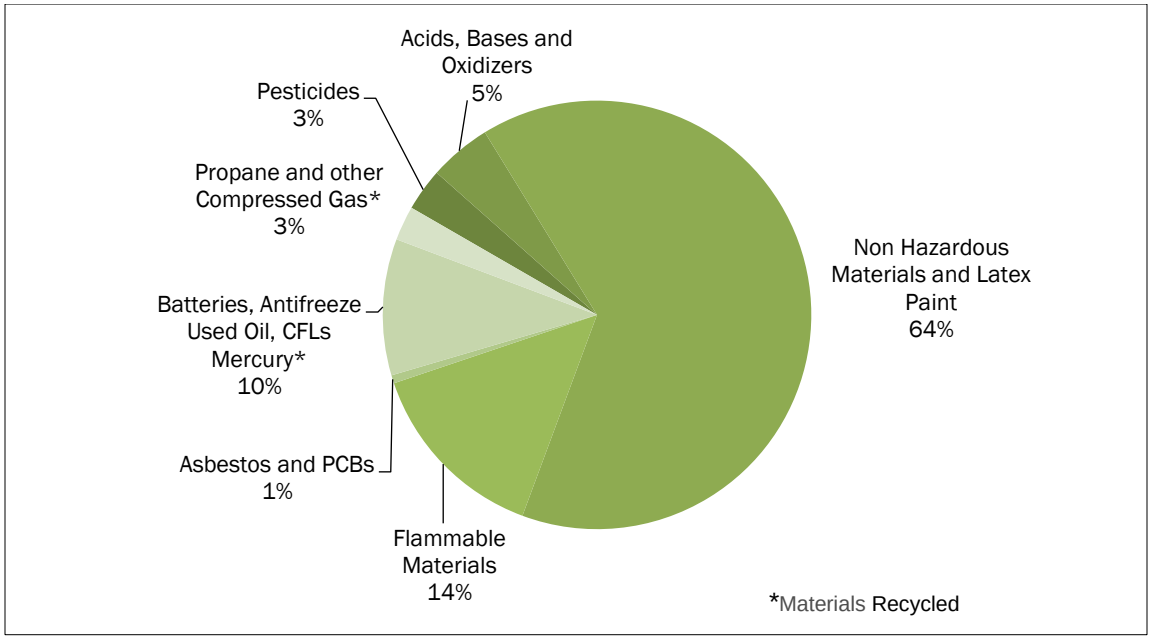
Source: Philadelphia Streets Department

Figure 1-7 HHW & E-Waste Participation



Source: Philadelphia Streets Department

Figure 1-8 Philadelphia HHW Program: Composition of Hazardous Materials Accepted



Source: Philadelphia Streets Department

1.4.4 TIRES

State regulations governing the storage and transportation of residual waste also deal specifically with tires (including storage requirements, recordkeeping and reporting requirements, and a landfill ban on whole tires). The City accepts automotive tires from residents at the Sanitation Convenience Centers, limited to four tires per resident per day. In addition, the City has implemented an annual Tire Round-Up Program, which is a partnership between the City and volunteer groups to collect illegally discarded tires. Under the program, volunteer groups register with the City to collect tires during a cleanup schedule established by the Philadelphia More Beautiful Committee. Registered groups are paid $0.50 for each illegally discarded tire the group collects and delivers to temporary drop-off sites established across the City. Throughout the year, the Streets Department collects other illegally discarded tires that are reported or that it otherwise finds along the roads. In 2018 the City collected and disposed of approximately 2,360 tons tires, all of which were delivered to Covanta Delaware Valley.

1.4.5 ASH FROM RESOURCE RECOVERY FACILITIES

The PADEP Bureau of Waste Management, Division of Reporting and Fee Collection reports that 107 tons of ash residue was generated in Philadelphia in 2018 and disposed at the Tullytown Resource Recovery Facility Landfill.

1.4.6 BIOSOLIDS

The Philadelphia Water Department (PWD) operates three water pollution control plants (WPCPs) in the City. They are the Northeast WPCP, the Southeast WPCP, and the Southwest WPCP. The combined design capacity of the three plants is 522 million gallons per day (MGD) of wastewater flow. These wastewater treatment plants serve a population of 2.4 million users, of which more than 60 percent are City residents.

WPCPs biosolids are processed at the Biosolids Recycling Center (BRC) located at 7800 Penrose Ferry Road. The BRC is operated by Synagro Technologies via contract through the Philadelphia Biosolids Services (PBS) company. Based on fiscal year 2015-2019 data, an average of 60,000 dry tons are processed annually. Biosolids generation fluctuates based on average wastewater flow during the year. For example, in fiscal year 2018, the BRC processed 60,098 dry tons of solids, compared to 68,737 dry tons in fiscal year 2019.

Biosolids are dewatered to 30 percent solids using centrifuges. After dewatering the sludge cake is dried and pelletized, resulting in granulite that is marketed by Philadelphia Renewable Bio-Fuel (PRBF). The dried sludge pellets are used as a fuel source for Lehigh Cement and as fertilizer for agricultural use. During normal operations, all dewatered sludge cake is converted to pellets and none is landfilled. Based on a five-year average of fiscal year 2015-2019 data, approximately 62,000 tons of pellets are created from this process. In practice, some portion of biosolids are landfilled each year. Based on calendar year 2016-2018 data, an average of 13,500 tons of biosolids are landfilled annually.

The WPCPs produce grit, screenings, and scum known as "wastewater by-products". Grit consists of sand, gravel, and metallic objects which settle in special chambers and which are scraped from the floor of the chambers for disposal. Screenings are coarse fragments trapped by bar screens at the influent gate to the plant; and usually include such items as cans, rags, and sticks. Scum largely consists of oils and grease, but also of small floatable wood and plastic pieces passing the bar screens, which are collected from the surface of the treatment tanks for separate disposal. The quantity of wastewater by-products generated at the WPCPs and by the Inlet Cleaning Unit and Sewer Maintenance Unit is approximately 11,000 wet tons per year. The estimated annual quantities of these wastewater by-products from the three plants are: 8,000 tons per year of grit; 1,000 tons per year of screenings; and 1,200 tons per year of scum.

The disposition of the Wastewater By-Products is as follows: scum, grit and screenings are transported to a permitted holding area located at the Southwest WPCP. Pulverized lime is mixed with the scum, grit

and screenings to reduce odors, pathogens, and free liquids. The treated Wastewater By-Products are subsequently transported to a municipal solid waste landfill for co-disposal with trash.

At the drinking water treatment plants operated by the Philadelphia Water Department, residuals generated from the raw water reservoir, flocculation/sedimentation basins, and filter backwash are collected and disposed to the City's sanitary sewers. Therefore, the water treatment residuals are transported to the WPCPs via the sanitary sewers.

CHAPTER 2 – DESCRIPTION OF FACILITIES

2.1 INTRODUCTION

In accordance with Section 502 (c) of Act 101 and 25 Pa. Code § 272.224, this Chapter describes existing disposal, processing and transfer facilities accepting waste generated in the City of Philadelphia. This Chapter provides an assessment of the remaining permitted capacity of these facilities, including addition capacity that could be made available through facility expansions. This Chapter also confirms the combination of City-contracted waste disposal and processing facilities and the regional waste disposal facilities and processors accepting municipal waste from private haulers serving the City have capacity available for City-generated municipal waste.

2.2 LANDFILLS AND RESOURCE RECOVERY FACILITIES

Table 2-1 presents the Pennsylvania landfills and resource recovery facilities accepting municipal solid waste generated from Philadelphia in 2018. Table 2-2 identifies disposal facilities under contract with the City for disposal services from July 1, 2019 through June 30, 2026. Some wastes of Philadelphia origin, including commercial waste collected by private haulers, is delivered to out-of-state facilities for disposal. Out-of-state disposal is not tracked or reported by PADEP and these quantities are unknown and not included in this Plan. Section 2.4 of this Plan provides additional information on disposal facilities that may accept privately collected waste generated in Philadelphia over the period of this Plan.

A brief description of the disposal facilities listed in Table 2-1 and Table 2-2 follows.

Table 2-1 Pennsylvania Facilities Receiving Philadelphia Waste (2018)

Permit Number	Disposal Facility Name	Municipal Waste Disposed (tons) [1]
100113	Modern Landfill	203,271
100346	Pioneer Crossing Landfill	88
101699	Fairless Landfill	496,907
101509	Conestoga Landfill	31,724
101615	Commonwealth Environmental Systems	1,668
101247	Keystone Sanitary Landfill	666
400558	Covanta Plymouth Renewable Energy	38,460
400561	York County Resource Recovery Center	6,141
400592	LCSWMA Resource Recovery Facility	5,133
400593	Covanta Delaware Valley	403,975
400633	Wheelabrator Falls Resource Recovery Facility	105,864
	Total	**1,295,843**

[1] Source: PADEP Bureau of Waste Management, Division of Reporting and Fee Collection. Individual line items may not add to the total due to rounding.

Table 2-2 PA Facilities Contractually Available to Receive City of Philadelphia Waste (2019)

Permit Number	Facility Name	Designated Facilities
Waste Management		
101699	Fairless Landfill	Landfill
101680	G.R.O.W.S. North Landfill [1]	Landfill
400633	Wheelabrator Falls Resource Recovery Facility	Resource Recovery Facility
WMGM037SE001	SpecFUEL™ Facility at Forge Recycling and Resource Recovery Center [2]	Processing Facility [3]
Covanta		
100345	Rolling Hills Landfill [2]	Landfill
400558	Covanta Plymouth Renewable Energy	Resource Recovery Facility
400593	Covanta Delaware Valley	Resource Recovery Facility
100020	IESI PA Bethlehem Landfill [2]	Alternate Landfill
100934	IESI PA Blue Ridge Landfill [2]	Alternate Landfill
400561	York County Resource Recovery Center	Alternate Resource Recovery Facility
400592	LCSWMA Resource Recovery Facility (Lancaster)	Alternate Resource Recovery Facility
100758	LCSWMA Susquehanna Resource Management Complex (Harrisburg) [2]	Alternate Resource Recovery Facility

[1] Contractually available as of 2019, but not reported as receiving municipal waste in 2018.
[2] See Section 2.3 of this Plan for additional information about facility designations.
[3] Facility processes mixed municipal waste to remove remaining recyclable materials, metal and PVC plastic to create an engineered fuel product that has reduced environmental air quality impacts compared to fossil fuel alternatives.

2.2.1 IESI PA Bethlehem Landfill

IESI Bethlehem Landfill is located at 2335 Applebutter Road in Bethlehem, PA. The permit number is 100020. IESI Bethlehem Landfill is operated by IESI, which is part of Progressive Waste Solutions. IESI Bethlehem Landfill has an average daily volume of 1,375 tons per day and a maximum daily volume of 1,800 tons per day. The IESI PA Bethlehem Landfill is an Alternate Designated Disposal Facility for the City under the Covanta agreement; however, in 2018 no municipal waste from Philadelphia was delivered to the landfill.

2.2.2 Modern Landfill

Modern Landfill is located at 4400 Mt. Pisgah Road in York, PA. The permit number is 100113. Modern Landfill is operated by Republic Services. Modern Landfill has an average daily volume of 4,667 tons per day and a maximum daily volume of 5,000 tons per day. In 2018, 203,271 tons of municipal waste from Philadelphia was delivered to Modern Landfill

2.2.3 Rolling Hills Landfill

Rolling Hills Landfill is located at 583 Longview Road in Boyertown, PA. The permit number is 100345. Rolling Hills Landfill is operated by Delaware County Solid Waste Authority. Rolling Hills Landfill has an average daily volume of 3,200 tons per day and a maximum daily volume of 3,840 tons per day. The Rolling Hills Landfill is a Designated Disposal Facility for the City under the Covanta agreement; however, in 2018 no municipal waste from Philadelphia was delivered to the landfill.

2.2.4 PIONEER CROSSING LANDFILL

Pioneer Crossing Landfill is located at 727 Red Lane Road in Birdsboro, PA. The permit number is 100346. Pioneer Crossing Landfill is operated by an entity of J.P. Mascaro & Sons, Inc. Pioneer Crossing Landfill has an average daily volume of 1,000 tons per day and a maximum daily volume of 1,600 tons per day. In 2018, 88 tons of municipal waste from Philadelphia was delivered to Pioneer Crossing Landfill.

2.2.5 COMMONWEALTH ENVIRONMENTAL SYSTEMS LANDFILL

Commonwealth Environmental Systems Landfill is located on E Commonwealth Avenue in Foster Township, PA. The permit number is 101615. The landfill is operated by Commonwealth Environmental Systems. It has an average daily volume of 4,750 tons per day and a maximum daily volume of 5,000 tons per day. In 2018, 1,668 tons of municipal waste from Philadelphia was delivered to Commonwealth Environmental Systems Landfill.

2.2.6 IMPERIAL LANDFILL

Imperial Landfill is located at 11 Boggs Road in Imperial, PA. The permit number is 100620. Imperial Landfill is operated by Republic Services. The landfill has an average daily volume of 3,100 tons per day and a maximum daily volume of 4,666 tons per day. In 2018, no municipal waste from Philadelphia was delivered to Imperial Landfill.

2.2.7 IESI BLUE RIDGE LANDFILL

IESI Blue Ridge Landfill is located at 1660 Orchard Rd in Chambersburg, PA (mailing address P.O. Box 399 Scotland, PA). The permit number is 100934. IESI Blue Ridge Landfill is operated by IESI, which is part of Progressive Waste Solutions. IESI Blue Ridge Landfill has an average daily volume of 1,700 tons per day and a maximum daily volume of 2,000 tons per day. The IESI Blue Ridge Landfill is an Alternate Designated Disposal Facility for the City under the Covanta agreement; however, in 2018 no municipal waste from Philadelphia was delivered to the landfill.

2.2.8 CUMBERLAND COUNTY LANDFILL

Cumberland County Landfill is located at 135 Vaughan Rd .in Shippensburg, PA. The permit number is 100945. Cumberland County Landfill is operated by Advanced Disposal. Cumberland County Landfill has an average daily volume of 2,500 tons per day and a maximum daily volume of 2,950 tons per day. In 2018, no municipal waste from Philadelphia was delivered to Cumberland County Landfill.

2.2.9 LCSWMA SUSQUEHANNA RESOURCE MANAGEMENT COMPLEX

The LCSWMA Susquehanna Resource Management Complex is located at 1670 South 19th Street, Harrisburg, PA. The permit number is 100758. The facility is owned by the Lancaster County Solid Waste Management Authority and operated by Covanta Harrisburg, Inc. PADEP reports that the facility has an average daily volume of 985 tons per day, but does not provide a maximum daily volume. Information available from the Energy Recovery Council indicates there are three units at the facility with a combined processing capacity of 800 tons per day. The facility is an Alternate Designated Disposal Facility for the City under the Covanta agreement. In in 2018, 1,946 tons of municipal waste from Philadelphia was delivered to the facility.

2.2.10 THE FORGE CORE ORGANICS RECYCLING AND SPECFUEL™ CENTER

The Forge Core Organics Recycling Center is located at 5245 Bleigh Avenue in Philadelphia, PA. It is the location of the Waste Management SpecFUEL™ facility. The SpecFUEL™ Facility is a Designated Disposal Facility for the City under the Waste Management agreement. The tonnages processed through this facility vary and are driven by supply and demand factors. Because of the relatively inexpensive cost of natural gas extraction in Pennsylvania, demand for the SpecFUEL™ product has been relatively week in recent years. The City estimates that between 200 to 400 tons of municipal waste from Philadelphia is processed in the SpecFUEL™ facility per day.

2.2.11 ADVANCED DISPOSAL SERVICES GREENTREE LANDFILL

The Greentree Landfill is located at 635 Toby Rd in Kersey, PA. The permit number is 101397. It is operated by Advanced Disposal Services. The landfill has an average daily volume of 5,500 tons per day and a maximum daily volume of 6,000 tons per day. In 2018, no municipal waste from Philadelphia was delivered to the Greentree Landfill.

2.2.12 FAIRLESS LANDFILL & TULLYTOWN RESOURCE RECOVERY FACILITY

The Fairless Landfill (permit number 101699) and the Tullytown Resource Recovery Facility (permit number 101494) are located at 1000 New Ford Mill Rd. in Morrisville, PA. The permit number is 101494. Both landfills are operated by Waste Management. PADEP reports that in combination, the Tullytown Resource Recovery Facility, Tullytown Landfill, the Fairless Landfill and the G.R.O.W.S. North Landfill have an average daily volume of 18,333 tons per day and a maximum daily volume of 20,000 tons per year. The Fairless Landfill is a Designated Disposal Facility for the City under the Waste Management agreement. In 2018, the City and/or private haulers delivered 496,907 tons of municipal waste from Philadelphia to the Tullytown Resource Recovery Facility.

2.2.13 CONESTOGA LANDFILL

Conestoga Landfill is located on Harvey and Shiloh Road in Morgantown, PA. The permit number is 101509. Conestoga Landfill is operated by Republic Services. Conestoga Landfill has an average daily volume of 5,210 tons per day and a maximum daily volume of 10,000 tons per day. The Fairless Landfill is a Designated Disposal Facility for the City under the Covanta agreement. In 2018, 31,724 tons of municipal waste from Philadelphia was delivered to Conestoga Landfill.

2.2.14 G.R.O.W.S. NORTH LANDFILL

G.R.O.W.S. North Landfill is located at 1000 New Ford Mill Rd. in Morrisville, PA. The permit number is 101680. G.R.O.W.S. North Landfill is operated by Waste Management. PADEP reports that in combination, the Tullytown Landfill, the Fairless Landfill and the G.R.O.W.S. North Landfill have an average daily volume of 18,333 tons per day and a maximum daily volume of 20,000 tons per year. In 2018, no tons of municipal waste from Philadelphia was delivered to this facility.

2.2.15 COVANTA PLYMOUTH RENEWABLE ENERGY

Covanta Plymouth Renewable Energy is located at 1155 Conshohocken Rd, Conshohocken, PA. The permit number is 400558. Covanta Plymouth Renewable Energy is owned and operated by Covanta Plymouth Renewable Energy. Covanta Plymouth Renewable Energy has an average daily volume of 2,520 tons per day; the maximum daily volume is not provided in the PADEP database. Information available from the Energy Recovery Council indicates there are two units at the facility with a combined processing capacity of 1,216 tons per day. Covanta Plymouth Renewable Energy is a Designated Disposal Facility for the City under the Covanta agreement. For 2018 the City and/or private haulers delivered 38,460 tons of municipal waste to the facility.

2.2.16 YORK RESOURCE RECOVERY CENTER

The York Resource Recovery Center is located at 2700 Blackbridge Rd, York, PA. The permit number is 400561. The York Resource Recovery Center is owned by the York County Solid Waste Authority and operated by Covanta York Renewable Energy, LLC. York Resource Recovery Center has an average daily volume of 1,344 tons per day; the maximum daily volume is not provided in the PADEP database. Information available from the Energy Recovery Council indicates there are three units at the facility with a combined processing capacity of 1,344 tons per day. The York County Resource Recovery Center is an Alternate Designated Disposal Facility for the City under the Covanta agreement. The City and/or private haulers delivered 6,141 tons of municipal waste from Philadelphia to the facility in 2018.

2.2.17 LCSWMA RESOURCE RECOVERY FACILITY

The LCSWMA Resource Recovery Facility is located at 1911 River Road, Marietta, PA. The permit number is 400592. The facility is owned by the Lancaster County Solid Waste Management Authority (LCSWMA) and operated by Covanta Lancaster, Inc. The facility has an average daily volume of 1,200 tons per day; the maximum daily volume is not provided in the PADEP database. Information available from the Energy Recovery Council indicates there are three units at the facility with a combined processing capacity of 1,200 tons per day. The LCSWMA Resource Recovery Facility is an Alternate Designated Disposal Facility for the City under the Covanta agreement. In 2018, the City and/or private haulers delivered 5,133 tons of municipal waste from Philadelphia to the facility.

2.2.18 WHEELABRATOR FALLS, INC.

Wheelabrator Falls, Inc. is located at 1201 New Ford Mill Rd. in Morrisville, PA. The permit number is 400633. Wheelabrator Falls, a municipal waste-to-energy facility, is owned and operated by Wheelabrator Technologies. Wheelabrator Falls has an average daily volume of 2,800 tons per day as provided in the PADEP database. Information available from the Energy Recovery Council indicates there are two units at the facility with a combined processing capacity of 1,500 tons per day. Wheelabrator Falls is a Designated Disposal Facility for the City under the Waste Management agreement. Municipal tonnage deliveries from the City of Philadelphia or private haulers totaled 105,864 in 2018.

2.2.19 DELAWARE VALLEY RESOURCE RECOVERY FACILITY

The Delaware Valley Resource Recovery Facility is located at 10 Highland Ave., Chester, PA. The permit number is 500593. The Delaware Valley Resource Recovery Facility is owned and operated by Covanta Delaware Valley, L.P. The Delaware Valley Resource Recovery Facility has an average daily volume of 4,745 tons per day, and a maximum daily volume of 5,700 tons per day. Information available from the Energy Recovery Council indicates there are six units at the facility with a combined processing capacity of 3,348 tons per day. Covanta Delaware Valley is a Designated Disposal Facility for the City. For 2018 there were 403,975 tons of municipal waste delivered by the City and/or private haulers to this facility.

2.3 TRANSFER STATIONS AND PROCESSING FACILITIES

Transfer Stations located in the City of Philadelphia are listed in Table 2-3. The NW Transfer Station is owned and operated by the City of Philadelphia. The 58th Street Transfer Station, the Girard Point Transfer Station (backup), the Forge Transfer Station, and the Philadelphia Transfer Station are contractually available to the City as of July 1, 2019 and continuing through June 30, 2026.

Table 2-3 Transfer Stations in Philadelphia [1]

Primary Facility ID	Transfer Station	Address
483498	58th Street Transfer Station	2209 South 58th St.
716195	American C&D Logistics	3604 South Penrose Ferry Ave.
482434	Burns, Richard S. & Co.	4300 Rising Sun Ave.
483453	City of Philadelphia Streets Department NW Transfer Station	5201 Umbria St.
277705	Forge Recycling and Transfer Station with WM SpecFUEL™ Facility	5245 Bleigh Ave.
544388	Girard Point Transfer Station	3600 South 26th St.
512634	Philadelphia Transfer & Recycling Facility	3605 Grays Ferry Ave.
482039	Quick-Way, Inc.	2960 Orthodox St.
294707	TRC, Inc.	2904 South Delaware Ave.
483677	United States Recycling, Inc.	6101 Tacony St.

[1] Source: PADEP Online Municipal Waste Portal (2019)

2.4 CITY OF PHILADELPHIA WASTE TRANSFER AND DISPOSAL AGREEMENTS

In 2018, the City of Philadelphia Department of Streets developed and issued a Request for Proposals (RFP) for disposal capacity for City-collected municipal waste. The City evaluated responses to that RFP from vendors of transfer stations and disposal capacity in consideration of cost, environmental impact, neighborhood impact, and operational efficiency. Based on the evaluation, the City entered into waste transfer and disposal agreements with Waste Management of Pennsylvania, Inc. and Covanta Sustainable Solutions, LLC. The City ordinances authorizing the Streets Commissioner to enter into the agreements with Covanta and Waste Management were Council Bill Nos. 190468 and 190469, respectively.

City disposal agreements commenced on July 1, 2019, include a base period of four years and include three 1-year renewal periods at the discretion of the City. The seven-year disposal contracts, inclusive of all renewal years, expire on June 30, 2026. The City's contracted disposal capacity is, at minimum, 652,600 tons per year for City-collected municipal solid waste.

2.4.1 WASTE MANAGEMENT OF PENNSYLVANIA, INC. (WASTE MANAGEMENT)

The City's waste transfer and disposal agreement with Waste Management identifies the Forge Recycling and Resource Recovery Center and/or SpecFUEL™ Facility and the Philadelphia Transfer Station as designated transfer facilities. Both facilities are located in Philadelphia and are owned and operated by Waste Management.

The agreement specifies that Waste Management shall use reasonable best efforts to obtain permits and construct the WM SpecFUEL™ Technology at the Forge Recycling and Transfer Station. The SpecFUEL™ Technology consists of machinery and infrastructure to separate recyclables, remove organics, PVC, and other elements from the solid waste stream, extract materials of value from the remaining waste stream and pelletize those materials into solid fuel pellets for use in various combustion systems.

The City can deliver a maximum daily quantity of 625 tons per day of municipal solid waste to the Philadelphia Transfer Station and 1,575 tons per day to the Forge Transfer Station and/or WM

SpecFUEL™ Facility. This provides disposal capacity for the City for at least 410,000 tons per year of municipal solid waste. For each renewal term the City may adjust the maximum daily quantity to reflect changes in the quantity of waste collected by the City including demographic changes, source reduction, recycling, changed collection practices, and legal or regulatory changes, among other factors. The guaranteed annual quantity of waste to be delivered by the City to Waste Management is 117,000 tons per year at the Philadelphia Transfer Station and 224,250 tons per year at the Forge Transfer Station and/or WM SpecFUEL™ Facility. This guaranteed annual quantity is subject to change corresponding to any adjustment to the maximum daily quantity.

Final disposal of municipal waste delivered by or on behalf of the City to Waste Management must be at one of four Designated Disposal Facilities. These facilities are the Fairless Landfill, the G.R.O.W.S. North Landfill, the Wheelabrator Falls Resource Recovery Facility, and the WM SpecFUEL™ Facility. Prior to its closure in 2015, municipal waste was also delivered to Tullytown Resource Recovery Facility.

2.4.2 COVANTA 4 RECOVERY, LP (COVANTA)

The City's waste transfer and disposal agreement with Covanta identifies the 58th Street Transfer Station as the Designated Transfer Station. The Girard Point Transfer Station may be utilized as a backup facility. Both of these facilities are located in Philadelphia and operated by Covanta.

Designated Disposal Facilities specified in the agreement for the final disposal of municipal solid waste delivered by or on behalf of the City to Covanta include the Covanta Delaware Valley Resource Recovery Facility in Chester, and the Montgomery County Resource Recovery Facility in Conshohocken (Covanta Plymouth Renewable Energy). Alternate Designated Disposal Facilities identified in the agreement are the Covanta Lancaster Resource Recovery Facility, Covanta Camden Resource Recovery Facility, the Conestoga Landfill, and the Rolling Hills Landfill. Alternate Designated Disposal Facilities may be used by the City if Covanta is unable to fulfill its obligations under the Agreement.

The City has the right to deliver a maximum daily quantity of 270 tons per day to the Delaware Valley Resource Recovery Facility or the Montgomery County Resource Recovery Facility, and 665 tons per day to the 58th Street Transfer Station. This provides disposal capacity for the City for at least 243,000 tons per year of municipal solid waste. For each renewal term the City may adjust the maximum daily quantity to reflect changes in the quantity of waste collected by the City including demographic changes, source reduction, recycling, changed collection practices, and legal or regulatory changes, among other factors. The guaranteed annual quantity of waste to be delivered by the City to Covanta is 48,750 tons per year to Delaware Valley or Montgomery, and 58,500 tons per year to the 58th Street Transfer Station.

2.5 DISPOSAL FACILITIES FOR PRIVATELY-COLLECTED MUNICIPAL WASTE

In 2018, 12 Pennsylvania disposal facilities accepted nearly 1.3 million tons of municipal waste generated in Philadelphia (see Table 2-1). This quantity is equivalent to just under 5,000 tons per day of waste (based on 260 operating days per year). Of the total municipal waste generated in Philadelphia and disposed in 2018, nearly 0.5 million tons (almost 1,900 tons per day) was collected by the City. The remaining municipal waste that was disposed (0.8 million tons, or about 3,100 tons per day) was collected by private haulers and delivered to various permitted transfer and disposal facilities serving the City. The City does not control the flow of privately-collected waste; it allows private haulers to deliver waste for processing or disposal to any permitted facility.

To ensure adequate disposal capacity for both City-collected and privately-collected municipal waste generated in Philadelphia, the City has projected future quantities of municipal waste that will require disposal (see Chapter 3 of this Plan). During the 2017-2026 plan development process, the Streets Department conducted a survey to identify disposal facilities that are available or plan to accept privately-collected municipal waste and desire to be listed in this Plan. The survey was available on the City's website

between April 2015 and October 2015. In July 2015, a public notice was placed in the trade magazine BioCycle and a copy was given to DEP for publication in the PA Bulletin. In September 2017, facilities responded to the survey were contacted to confirm and update information through 2027. Table 2-4 lists the name, location and permit number of the facilities that responded to the Survey.

The City's survey requested information on the location and permitted capacity of the disposal facilities, the remaining available permitted capacity, the permit expiration date, planned expansions, and the capacity that could be committed to waste generated and collected in Philadelphia. The City's survey also requested completion of a form, certifying and representing that the respondent is the owner and/or operator of the disposal facility and that it can provide disposal capacity for privately collected municipal waste generated within Philadelphia. The majority of survey respondents completed the form.

Based on an evaluation of the survey information provided by the disposal facilities, these facilities had an aggregated remaining permitted disposal capacity on the order of 13.1 million tons in 2015 (i.e., at the time the survey was issued), diminishing to about 7.4 million tons by 2025 (i.e., near the end of the previous plan submittal's 2017-2026 planning period). This analysis assumes that existing permits that expire before 2025 will be renewed if capacity remains at the time of permit expiration. Several of the disposal facilities reported that an expansion is planned, underway, and/or approved. Accounting for the expansion capacity, the aggregated disposal capacity is projected to remain above 10 million tons through 2025. Most of the disposal facilities completed the certification form provided with the survey. Based on those forms, the facilities certified a willingness to make available more than 1.2 million tons per year of disposal capacity through 2026. Some of the certification forms did not specify a time period, but survey responses for those facilities indicate the capacity could be made available through the planning period. **Including this additional capacity, more than 1.5 million tons per year of disposal capacity is available for waste generated in Philadelphia. This available capacity exceeds the projected quantity of municipal waste that will require disposal (see Chapter 3 of this Plan, which projects no more than 1.4 million tons per year of municipal waste will require disposal).**

The City does not enter into any agreements with disposal facilities guaranteeing the delivery of privately-collected waste. The City's survey results demonstrate that there is sufficient disposal capacity available for the projected quantity of City-generated waste annually and over the planning period, including waste collected by private haulers. Table 2-4 identifies the disposal facilities that responded to the City's survey to be included in this Plan as a potential disposal location for municipal waste generated in Philadelphia.

Table 2-4 Disposal Facility Survey (2015)

Facility Name [1]	County	State	Permit Number	Certification [2]
Advanced Disposal Chestnut Valley Landfill	Fayette	PA	101419	Yes
Advanced Disposal Greentree Landfill	Elk	PA	101397	Yes
Advanced Disposal Mostoller Landfill, LLC	Somerset	PA	101571	Yes
Alliance Sanitary Landfill	Lackawanna	PA	100933	Yes
Blue Ridge Landfill	Franklin	PA	100934	Yes
Commonwealth Environmental Systems, L.P.	Schuylkill	PA	101615	Yes
Community Refuse Services Inc	Cumberland	PA	100945	Yes
Conestoga Landfill	York	PA	101509	Yes
Covanta 58th St Transfer Station	Philadelphia	PA	101477	No
Covanta Delaware Valley Res. Rec. Facility	Delaware	PA	400593	No
Covanta Plymouth	Montgomery	PA	400558	No
Delaware Recyclable Products	New Castle	DE	SW-05/01	Yes
Fairless Landfill	Bucks	PA	101699	Yes
FR&S, Inc dba Pioneer Crossing Landfill	Berks	PA	100346	Yes
G.R.O.W.S. Landfill	Bucks	PA	101680	Yes
IESI Bethlehem Landfill	Northampton	PA	100020	No
Keystone Sanitary Landfill, Inc.	Lackawanna	PA	101247	Yes
Lancaster Waste-to-Energy Facility	Lancaster	PA	400592	Yes
Lycoming County Landfill	Lycoming	PA	100963	Yes
McKean County Landfill	McKean	PA	100361	Yes
Modern Landfill	York	PA	100113	Yes
Mountainview Reclamation Landfill	Franklin	PA	101100	Yes
Seneca Landfill, Inc.	Butler	PA	100403	Yes
Susquehanna Res. Management Complex	Dauphin	PA	100758	Yes
Tullytown Res. Rec. Facility Landfill	Bucks	PA	101494	Yes
Wayne Township Landfill	Clinton	PA	100955	Yes
Western Berks Community Landfill	Berks	PA	100739	No
Wheelabrator Falls Inc.	Bucks	PA	400633	Yes
York County Resource Recovery Center	York	PA	400561	No

[1] Disposal facilities listed in this table responded to the City's 2015 survey seeking identification of potential disposal.
[2] Disposal facilities identified by "Yes" completed the City's "Certification of Municipal Waste Disposal Capacity" form.

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CHAPTER 3 – ESTIMATED FUTURE CAPACITY

3.1 ESTIMATING FUTURE DISPOSAL CAPACITY NEEDS FOR MUNICIPAL WASTE

Section 502 of Act 101 requires that municipal waste management plans include an estimate of the quantity of municipal waste that will be generated annually for each year of the planning horizon, and an analysis of the potential need for disposal capacity. For the purpose of determining how much disposal capacity is needed, the City has tabulated disposal and recycling records for 2007 through 2018 to project future net discards and gross generation of municipal waste quantities. Net discards represent the waste that is disposed while gross generation includes waste that is disposed plus material that is recycled. These projections do not include C&D waste, residual waste, sewage sludge (biosolids), ash residue, infectious waste or asbestos, which are accounted for separately from municipal waste.

Waste and recycling quantities are presented for both residential sources and commercial sources. As described in Chapter 1, residential sources are primarily collected by the City's Streets Department and include single-family homes and buildings in residential areas with six units or less, as well as the Philadelphia Housing Authority, some small businesses, street cleaning debris, and litter basket collections. Commercial sources are primarily collected by private haulers and include most commercial establishments, large institutional buildings, apartment buildings and condominium complexes.

3.2 HISTORICAL TRENDS FOR MUNICIPAL WASTE

3.2.1 DISPOSAL QUANTITIES (NET DISCARDS)

Table 3-1 summarizes the amount of municipal solid waste that was disposed of from 2007 through 2018 (net discards). As noted above, the data in Table 3-1 does not include C&D waste or other waste types that are accounted for separately from municipal waste.

Table 3-1 Municipal Waste Disposed (2007 – 2018) (Net Discards)

Year	Residential Waste Disposed (tons) [1]	Commercial Waste Disposed (tons) [2]	Total Waste Disposed (tons)
2007	641,724	1,185,701	1,827,425
2008	612,419	1,060,976	1,673,395
2009	559,907	878,928	1,438,835
2010	528,793	866,751	1,395,544
2011	530,779	859,663	1,390,442
2012	520,000	771,072	1,291,072
2013	498,024	818,167	1,316,191
2014	496,754	819,998	1,316,752
2015	459,330	868,974	1,328,304
2016	483,571	746,726	1,230,297
2017	440,901	721,040	1,161,942
2018	491,710	804,133	1,295,843

[1] Source: City Disposal Reports.
[2] Based on hauler reports compiled by the City for purpose of reporting data to PADEP. Data may differ somewhat from PADEP reports due to the City's need to estimate certain commercial data that is not reported in a timely way by some private haulers and/or that is incomplete.

As shown in Table 3-1, the total annual quantity of municipal waste disposed has declined from a high of more than 1.8 million tons in 2007 down to an average of some 1.28 million tons since 2012.

3.2.2 RECYCLING QUANTITIES

Table 3-2 summarizes the amount of municipal solid waste that was recycled from 2007 through 2018. As noted above, the data in Table 3-2 does not include C&D waste that was recycled, since C&D waste is accounted for separately from municipal waste.

Table 3-2 Municipal Waste Recycled (2007 – 2018) [1]

Year	Residential Waste Recycled (tons)	Commercial Waste Recycled (tons) [2]	Total Waste Recycled (tons)
2007	49,243	764,040	813,283
2008	54,992	834,139	889,131
2009	74,797	764,119	838,916
2010	90,475	915,603	1,006,078
2011	105,248	973,635	1,078,883
2012	122,680	841,636	964,316
2013	126,263	717,692	843,955
2014	126,720	681,551	808,271
2015	116,553	801,795	918,348
2016	118,367	828,676	947,043
2017	129,620	815,810	945,430
2018	126,802	798,075	924,877

[1] Includes all materials reported by the Streets Department to PADEP in its annual recycling report. Data may differ somewhat from PADEP reports due to the City's need to estimate commercial data that is not reported in a timely way by some private haulers, and/or that is incomplete.
[2] A portion of the commercial recycling quantities for 2015 through 2018 are estimated values based on data reported by private entities and adjusted by the City using representative data from 2011 through 2014 to account for non-reported, or under-reported materials.

As shown in Table 3-2, the annual quantity of City-collected residential recycling increased annually from 2007 until 2014. In 2015, the quantity of City-collected residential recycling decreased. However, the total tons disposed also decreased in 2015 resulting in a calculated residential recycling rate that was similar to the rate achieved in 2014 (just over 20 percent). Additional information on the City's recycling program, including factors that have contributed to the historical increases in residential recycling, is presented in Chapters 4 and 5 of this Plan.

Data presented in Table 3-2 shows that commercial recycling increased from 2007 through 2011, followed by declining quantities from 2012 through 2014. However, the City believes that commercial recycling quantities may be under-reported for the past several years due to haulers stockpiling materials such as ferrous metals during market downturns. In addition, as City staff reports challenges with ensuring commercial generators report tonnages on a timely basis. Accordingly, commercial recycling data for 2015 through 2018 includes some estimates by the City to adjust for these factors.

3.2.3 GROSS GENERATION OF MUNICIPAL WASTE

Gross municipal waste generation is the quantity of municipal waste that is disposed (as tabulated in Table 3-1) plus the quantity of materials recycled (as tabulated in Table 3-2). Table 3-3 summarizes gross

municipal waste generation for 2007 through 2018. As noted above, the data in Table 3-3 does not include C&D waste or other waste types that are accounted for separately from municipal waste.

Table 3-3 Gross Municipal Waste Generated (2007 – 2018)

Year	Gross Residential Waste Generation (tons) [1]	Gross Commercial Waste Generation (tons) [1]	Total Gross Municipal Waste Generation (tons)
2007	690,967	1,949,741	2,640,708
2008	667,411	1,895,115	2,562,526
2009	634,704	1,643,047	2,277,751
2010	619,268	1,782,354	2,401,622
2011	636,027	1,833,298	2,469,325
2012	642,680	1,612,708	2,255,388
2013	624,287	1,535,859	2,160,146
2014	623,474	1,501,549	2,125,023
2015	575,883	1,670,769	2,246,652
2016	601,938	1,575,402	2,177,340
2017	570,521	1,536,850	2,107,371
2018	618,513	1,602,208	2,220,720

[1] Source: City Disposal Reports.
[2] Based on hauler reports compiled by the City for purpose of reporting data to PADEP. Data may differ somewhat from PADEP reports due to the City's need to estimate certain commercial data that is not reported in a timely way by some private haulers and/or that is incomplete.

As shown in Table 3-3, total gross municipal waste generation (including waste recycled and waste disposed from both residential and commercial sources in Philadelphia, and excluding C&D waste) has declined from approximately 2.6 million tons in 2007 to approximately 2.2 million tons in 2018.

3.3 MUNICIPAL WASTE GENERATION RATE FORECAST

For purpose of this Plan, the City has developed a municipal waste generation forecast that considers both residential and commercial gross municipal waste generation as well as recycling quantities, from which net discards requiring disposal are projected. Residential municipal waste generation rates are projected on a per-capita basis, and commercial municipal waste generation rates are projected on a per-employee basis. Population and employment forecasts from the Delaware Valley Regional Planning Commission (DVRPC) are used with the per-capita and per-employee generation rates to calculate gross municipal waste quantities for the ten-year planning period. Recycling rates for residential and commercial sources are projected based on steadily increasing recycling to achieve the City's 50 percent overall recycling goal by the end of the planning period. Projected net discards are calculated as gross waste minus recycling quantities. Projected net discards represent future disposal capacity estimated to be needed over the duration of the Plan.

As further discussed in Chapter 5, the SWRAC Goals and Metrics Subcommittee has begun to consider a number of objectives associated with recycling and waste diversion goals for the City, including continued efforts to improve the City's recycling program and the recently-established Zero Waste and Litter Cabinet. These future, ongoing efforts could further increase the City's recycling rate, but are not yet quantitative. Therefore, these future efforts are not reflected in the waste generation forecast to ensure disposal capacity needs are not underestimated.

3.3.1 RESIDENTIAL MUNICIPAL WASTE GENERATION RATE

The most recently published population data from the DVRPC are for 2010 (based on Census data) and 2018 (Census estimate), with data forecasted by DVRPC in five-year increments through 2045 (County- and Municipal-Level Population Forecasts, 2015-2045, Analytical Data Report 022, August 2016).

For purpose of estimating gross residential municipal waste generation rates for 2010 through 2018, the DVRPC population data and projections have been linearly interpolated and are shown in Table 3-4. Table 3-4 also includes the gross residential municipal waste quantities for these years (taken from Table 3-3), and shows the calculated per-capita gross residential municipal waste generation rate for each year (tons per person per year). As shown in Table 3-4, the per-capita gross residential municipal waste generation rate has fluctuated between 0.37 and 0.41 tons per person per year over the past six years, with an average rate of 0.40 tons per person per year. For planning purposes, a reasonable estimate of the future per-capita gross residential municipal waste generation rate is the average rate of 0.40 tons per person per year.

Table 3-4 Philadelphia Residential Municipal Waste Generation Rate (2010 – 2018)

Year	Philadelphia Population [1]	Gross Residential Waste Generation (tons) [2]	Per-Capita Gross Residential Waste Generation Rate (tons per person per year)
2010	1,526,006	619,268	0.41
2011	1,534,293	636,027	0.41
2012	1,542,581	642,680	0.42
2013	1,550,868	624,287	0.40
2014	1,559,156	623,474	0.40
2015	1,567,443	575,883	0.37
2016	1,576,390	601,938	0.37
2017	1,580,221	570,521	0.36
2018	1,584,138	618,513	0.39

[1] Source: Delaware Valley Regional Planning Commission; County- and Municipal-Level Population Forecasts, 2015-2045, Publication No. ADR022, August 2016; mid-years linearly interpolated.
[2] Source: City Disposal Reports.

3.3.2 COMMERCIAL MUNICIPAL WASTE GENERATION RATE

The most recently published employment data from the DVRPC are for the years 2010 and 2015, with projections in five-year increments through 2045 (Regional, County, and Municipal Employment Forecasts, 2015-2045, Analytical Data Report 023, October 2016).

For purpose of estimating gross commercial municipal waste generation rates for 2010 through 2018, the DVRPC employment data have been linearly interpolated and are shown in Table 3-5. Table 3-5 also includes the gross commercial municipal waste quantities (taken from Table 3-3), and shows the calculated per-employee gross commercial municipal waste generation rate for each year (tons per employee per year). As noted earlier in this Chapter, the commercial data does not include C&D waste or other waste types that are accounted for separately from municipal waste.

Table 3-5 Philadelphia Commercial Municipal Waste Generation Rate (2010 – 2018)

Year	Philadelphia Employees [1]	Gross Commercial Waste Generation (tons) [2]	Per-Employee Gross Commercial Waste Generation Rate (tons per employee per year)
2010	738,546	1,782,354	2.41
2011	745,406	1,833,298	2.46
2012	752,266	1,612,708	2.14
2013	759,127	1,535,859	2.02
2014	765,987	1,501,549	1.96
2015	772,847	1,670,769	2.16
2016	775,539	1,575,402	2.03
2017	778,231	1,536,850	1.97
2018	780,924	1,602,208	2.05

[1] Source: Delaware Valley Regional Planning Commission; Regional, County and Municipal Employment Forecasts, 2015-2045, Publication No. ADR023, October 2016; mid-years linearly interpolated.
[2] Based on hauler reports compiled by the City for purpose of reporting data to PADEP. Data may differ somewhat from PADEP reports due to the City's need to estimate certain commercial data that is not reported in a timely way by some private haulers and/or that is incomplete.

As shown in Table 3-5, the per-employee gross commercial municipal waste generation rate has fluctuated over the past six years from about 2.0 tons per employee per year to about 2.5 tons per employee per year, with an average rate of 2.19 tons per employee per year. For planning purposes, a reasonable estimate of the future per-employee gross commercial municipal waste generation rate is the average rate of 2.19 tons per employee per year.

3.4 RECYCLING RATE FORECAST

Using the data compiled above, Table 3-6 summarizes historical data on total gross municipal waste generated (residential and commercial) and total municipal waste recycled and calculates the annual historical recycling rate for the City of Philadelphia. As noted earlier in this Chapter, the data excludes C&D waste and other types of waste that are handled separately from municipal waste. Although not included in the municipal recycling rate forecast, C&D waste is recycled at a very high level (approximately 90 percent in 2015) and measurably increases the overall recycling rate for the City. Also not included in the forecast are potential future recycling initiatives that cannot yet be quantified.

Table 3-6 City of Philadelphia Diversion Rate (2007 – 2018)

Year	Total Gross Municipal Waste Generation (tons) [1]	Total Municipal Waste Recycled (tons) [2]	Municipal Waste Diversion Rate [3]
2007	2,640,708	813,283	30.8%
2008	2,562,526	889,131	34.7%
2009	2,277,751	838,916	36.8%
2010	2,401,622	1,006,078	41.9%
2011	2,469,325	1,078,883	43.7%
2012	2,255,388	964,316	42.8%
2013	2,160,146	843,955	39.1%
2014	2,125,023	808,271	38.0%
2015	2,246,652	918,348	40.9%
2016	2,277,340	947,043	43.5%
2017	2,107,371	945,430	44.9%
2018	2,220,720	924,877	41.6%

[1] Source: City Disposal Reports and Hauler Reports.
[2] Includes all materials reported by the Streets Department to PADEP in its annual recycling report. Data may differ somewhat from PADEP reports due to the City's need to estimate commercial data that is not reported in a timely way by some private haulers, and/or that is incomplete.
[3] Excludes C&D waste recycling, since C&D is considered a "nonstandard material" by PADEP.

As shown in Table 3-6, the municipal recycling rate increased from approximately 31 percent in 2007 to approximately 42 percent in 2018, with a high of almost 45 percent in 2017. Fluctuations over time, particularly decreases in 2013 and 2014, may be due to inaccurate and incomplete commercial recycling data that is not reported in a timely way by some private haulers. As further described in Chapters 4 and 5 of this Plan, the City intends to continue to emphasize recycling as a preferred element of its waste management hierarchy, and has identified measures that will be pursued to promote increased municipal recycling from both the residential and commercial sectors. The City is also working to increase efforts to collect more complete commercial data. For planning purposes, the City projects that efforts described in Chapters 4 and 5 of this plan will help to increase the municipal recycling rate to achieve the City's original goal of 50 percent and the more progressive sustainability goal of Zero Waste by 2035. Although the City will continue to pursue recycling and Zero Waste initiatives that may increase the recycling rate to greater than 50 percent, for planning purposes the rate is set at 50 percent to avoid underestimating future disposal capacity needs. Although not incorporated into the municipal recycling numbers presented herein, the City will also continue to promote C&D recycling, which has been occurring at a very high rate.

3.5 PROJECTED FUTURE GROSS AND NET DISCARDS

Based on the population projections and employment forecasts published by the DVRPC, and applying the municipal waste generation and recycling rates established above, the City has calculated projected gross municipal waste quantities and net discards for the planning period of 2019 through 2028. These projections are shown in Table 3-7.

Table 3-7 City of Philadelphia Projected Gross Municipal Waste and Net Discards (2018 – 2028)

	Base Year 2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Population Forecast [1]	1,583,849	1,589,318	1,594,787	1,599,193	1,603,599	1,608,004	1,612,410	1,616,816	1,622,247	1,627,678	1,633,109
Employment Forecast [1]	780,924	783,616	786,308	788,478	790,647	792,817	794,986	797,156	799,840	802,523	805,207
Gross Waste (tons)											
Residential [2]	618,513	604,559	606,639	608,315	609,991	611,667	613,343	615,019	617,085	619,151	621,216
Commercial [3]	1,602,208	1,595,436	1,600,917	1,605,334	1,609,752	1,614,169	1,618,586	1,623,003	1,628,467	1,633,931	1,639,395
Total Gross Waste	**2,220,720**	**2,199,995**	**2,207,556**	**2,213,649**	**2,219,743**	**2,225,836**	**2,231,929**	**2,238,022**	**2,245,552**	**2,253,082**	**2,260,611**
Recycling Quantities											
Percent Recycled [4][5]	42%	43%	44%	45%	46%	47%	48%	49%	50%	51%	52%
Tons Recycled	924,877	938,246	963,546	988,342	1,013,260	1,038,300	1,063,461	1,088,745	1,114,863	1,141,132	1,167,552
Net Discards Requiring Disposal	**1,295,843**	**1,261,749**	**1,244,010**	**1,225,307**	**1,206,483**	**1,187,536**	**1,168,468**	**1,149,277**	**1,130,689**	**1,111,949**	**1,093,059**

[1] DVRPC data with mid-years linearly interpolated.
[2] Based on a residential gross waste generation rate of 0.40 tons per person per year.
[2] Based on a commercial gross waste generation rate of 2.19 tons per employee per year.
[4] Excludes C&D recycling.
[5] Increases in the recycling rate are shown as generally linear for long-term planning purposes and are anticipated to be achieved with the programs and policies outlined in Chapters 4 and 5 of this Plan.

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CHAPTER 4 – DESCRIPTION OF RECYCLING PROGRAM

4.1 BACKGROUND

The City of Philadelphia maintains a comprehensive and successful recycling program. This chapter provides descriptions of the City of Philadelphia's recycling programs and discusses the benefits of recycling.

Figure 4-1 Philadelphia Recycling Bin

In the early 1980's, the City established one of the first curbside recycling programs in the United States. Today, the curbside collection of metal, glass, plastic food and beverage containers, cardboard and mixed paper form the backbone and the most visible component of City's recycling and waste reduction efforts. Serving some 540,000 homes, Philadelphia weekly curbside recycling program is one of the largest curbside recycling programs in the U.S.

Philadelphia's program has undergone significant transformation since its City-wide implementation in the mid-1990s, particularly in the mid-to-late 2000's. These changes included the switch from bi-weekly to weekly collections, the transition from dual-stream to single-stream collection, the addition of new recyclable materials, and recycling incentive programs.

As one of the oldest and largest municipal recycling programs in the U.S., it has experienced the ups and downs that have characterized recycling over the past 30 years. However, the City's programs have also received accolades for their innovation, and resiliency, and have achieved considerable success. The City continues to invest in recycling programs and seek ways to improve efficiency, participation, and achieve higher recovery rates.

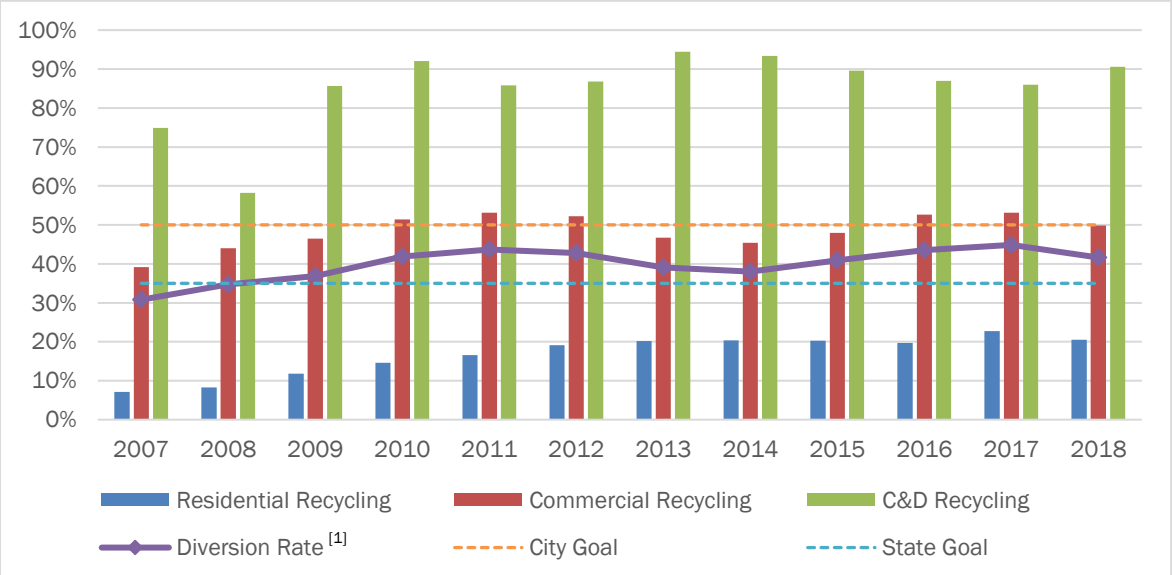
4.2 OVERALL RECYCLING ACHIEVEMENTS

The City of Philadelphia has prioritized waste reduction and recycling within its waste management hierarchy and will continue to do so as part of this Plan. The City's annual overall diversion rate has consistently exceeded the Commonwealth's recycling goal of 35 percent since 2009. Indeed, Philadelphia has continued increasing its diversion efforts in pursuit of achieving the more aggressive 50 percent diversion goal established under Executive Order 15-08 in 2008. Since 2015 the reported City recycling rate has ranged between 40 to 45 percent.

Figure 4-2 below shows the recycling and overall diversion rate trends from 2007 through 2018, including commercial recycling, C&D recycling, and residential recycling. Table 4-1 presents the historical recycling data that underlies the figure. Table 4-2 presents the quantity of recyclables by material type within the City in 2018, based on data reported to PADEP.

Note that like the U.S. EPA and many states around the U.S., Pennsylvania's recycling and waste reduction goals include wastes generated by residents and commercial establishments, though exclude C&D which is considered a "nonstandard material." Therefore, C&D is excluded when calculating the City's diversion rate. However, the City has succeeded in diverting a substantial portion of its C&D stream, and so a separate diversion rate which includes C&D is also shown in Table 4-2.

Figure 4-2 Philadelphia Recycling & Diversion Trends (2007 – 2018)



Source: See Tables 3-1 through 3-6.
[1] Includes residential and commercial recycling only. C&D is considered a "nonstandard material" by PADEP and is therefore excluded for the purpose of benchmarking the City's progress towards the State's and its own goals.

Table 4-1 City of Philadelphia Diversion Rate (2007 – 2018)

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Recycling by Sector (tons)												
Residential	49,243	54,992	74,797	90,475	105,248	122,680	126,263	126,720	116,553	118,367	129,620	126,802
Commercial	764,040	834,139	764,119	915,603	973,635	841,636	717,692	681,551	801,795	828,676	815,810	798,075
C&D	407,746	136,263	336,926	487,877	318,104	399,939	369,814	339,514	393,424	356,358	356,358	356,358
Total Recycling	**1,221,029**	**1,025,394**	**1,175,842**	**1,493,955**	**1,396,987**	**1,364,255**	**1,213,769**	**1,147,785**	**1,311,772**	**1,303,401**	**1,301,787**	**1,281,235**
Disposal by Sector (tons)												
Residential	641,724	612,419	559,907	528,793	530,779	520,000	498,024	496,754	459,330	483,571	440,901	491,710
Commercial	1,185,701	1,060,976	878,928	866,751	859,663	771,072	818,167	819,998	868,974	746,726	721,040	804,133
C&D	136,822	97,638	56,577	41,875	52,595	60,728	21,737	24,153	45,699	53,435	58,254	36,971
Total Disposal	**1,964,247**	**1,771,033**	**1,495,412**	**1,437,419**	**1,443,037**	**1,351,800**	**1,337,928**	**1,340,905**	**1,374,003**	**1,283,732**	**1,220,196**	**1,332,814**
Generation by Sector (tons)												
Residential	690,967	667,411	634,704	619,268	636,027	642,680	624,287	623,474	575,883	601,938	570,521	618,513
Commercial	1,949,741	1,895,115	1,643,047	1,782,354	1,833,298	1,612,708	1,535,859	1,501,549	1,670,769	1,575,402	1,536,850	1,602,208
C&D	544,568	233,901	393,503	529,752	370,699	460,667	391,551	363,667	439,123	409,793	414,612	393,328
Total Generation	**3,185,276**	**2,796,427**	**2,671,254**	**2,931,374**	**2,840,024**	**2,716,055**	**2,551,697**	**2,488,690**	**2,685,775**	**2,587,133**	**2,521,983**	**2,614,049**
Diversion Rate by Sector (% of Generation)												
Residential	7.1%	8.2%	11.8%	14.6%	16.5%	19.1%	20.2%	20.3%	20.2%	19.7%	22.7%	20.5%
Commercial	39.2%	44.0%	46.5%	51.4%	53.1%	52.2%	46.7%	45.4%	48.0%	52.6%	53.1%	49.8%
Diversion Rate [1]	**30.8%**	**34.7%**	**36.8%**	**41.9%**	**43.7%**	**42.8%**	**39.1%**	**38.0%**	**40.9%**	**43.5%**	**44.9%**	**41.6%**
C&D	74.9%	58.3%	85.6%	92.1%	85.8%	86.8%	94.4%	93.4%	89.6%	87.0%	85.9%	90.6%
Diversion Rate (C&D included) [2]	**38.3%**	**36.7%**	**44.0%**	**51.0%**	**49.2%**	**50.2%**	**47.6%**	**46.1%**	**48.8%**	**50.4%**	**51.6%**	**49.0%**

Sources: See Tables 3-1 through 3-6.
[1] Includes residential and commercial recycling only. C&D is considered a "nonstandard material" by PADEP and is therefore excluded for the purpose of benchmarking the City's progress towards the State's and its own goals. Data may differ from that reported in other sources due to an under-reporting of commercial recycling data to PADEP.
[2] Includes residential, commercial, and C&D recycling. Data may differ from that reported in other sources due to an under-reporting of commercial recycling data to PADEP.

Table 4-2 Philadelphia Recycling by Material Type (2018)

Material	Quantity Recycled (total tons) [1]	Percent of Total Recycled
C&D Debris [2]	356,358	27.8%
White Goods [2]	285,989	22.3%
Non-ferrous Metals [2]	227,780	17.8%
Single Stream [3]	131,833	10.3%
Ferrous Metals [2]	131,250	10.2%
Wood Waste [2]	72,323	5.6%
Cardboard	38,050	3.0%
Office Papers	11,889	0.9%
Consumer Electronics	8,345	0.7%
Rubber Tires	4,504	0.4%
Mixed Papers	3,052	0.2%
Newsprint	2,457	0.2%
Food Waste	1,721	0.1%
Aluminum Scrap	1,333	0.1%
Yard and Leaf Waste	1,257	0.1%
Batteries: Lead Acid	1,070	0.1%
Mixed Metals	618	<0.1%
Mixed Plastics	545	<0.1%
Asphalt	305	<0.1%
Misc. Other Consumer [3]	170	<0.1%
Used Oil	161	<0.1%
Furniture and Furnishings	101	<0.1%
Other: Paints, Varnishes, Pesticides	36	<0.1%
Oil Filters	28	<0.1%
Antifreeze	26	<0.1%
Commingled Materials [3]	23	<0.1%
Fluorescent Tubes and CFLs	5	<0.1%
Clothing and Textiles	4	<0.1%
Batteries: Other Household Batteries	1	<0.1%
Aluminum Cans	0	0.0%
Mixed Glass	0	0.0%
Steel and Bimetallic Tin Cans	0	0.0%
Wire/Cable	0	0.0%
Total	**1,281,235**	**100%**

[1] Data taken from 2018 MRF and hauler reported quantities, unless noted otherwise.
[2] Data estimated from 2015/2016 totals due to underreporting of materials.
[3] Data taken from 2017 MRF and hauler reported quantities.

4.3 RESIDENTIAL RECYCLING PROGRAMS

4.3.1 CURBSIDE RECYCLING

With weekly collections to some 540,000 households, the City of Philadelphia operates one of the largest curbside recycling programs in the U.S. While residential solid waste only makes up about 30 percent of the Philadelphia's total solid waste generation (without including C&D), these services – particularly curbside recycling – are the most visible.

Figure 4-3 Philadelphia Recycling Truck with Mural Arts Program Branding

The City collects recyclables single-stream using rear-loading packer trucks. Collections are organized into six Sanitation Areas and thirteen districts that are divided into five collection days. Recyclables collected by the Streets Department are delivered to a Materials Recovery Facility owned and operated by Waste Management.

When the City began expanding curbside recycling in the early and mid-1990s, collections were initially provided every-other-week, and collected a smaller array of materials. The program was dual-stream, meaning participants were required to keep their metal, glass and plastic food and beverage containers separate from newspaper. Beginning in the mid-2000s, the City began to implement a number of program changes, including transitioning to single-stream (completed in 2008) weekly collections (completed by 2009), and by adding recyclables such as certain plastics, and cardboard. A standard rear-loading recycling City collection vehicle is shown as Figure 4-3.

4.3.2 RECYCLING BINS

To encourage curbside recycling, the City provides 22-gallon open-top recycling bins to residential customers. Recycling bins are made available at the City's Sanitation Convenience Centers, as well as through many civic and neighborhood associations who partner with the Streets Department. All told there are more than 30 recycling bin distribution sites. The City also frequently distributes curbside recycling bins away at community events. Some 21,000 recycling bins were distributed in 2018 alone.

A GIS-based recycling bin finder tool was added to the Streets Department website in 2015, and can be found here: https://www.philadelphiastreets.com/recycling/recycling-bin-pickup-location-map

Residents may also use household provided containers up to 32 gallons. There is no limit on the number of recycling containers that may be placed at the curbside.

In 2017 staff from Zero Waste and Litter Cabinet and Streets Department led a pilot initiative to examine potential impacts on recyclables yields and litter reduction through distribution of lidded recycling bins. Some 2,000 lidded bins were distributed among curbside four recycling routes – two each in the Port Richmond and Brewerytown neighborhoods. While the study found that the increase in lidded recycling bin distribution likely helped increase recycling volumes, the preliminary analysis did not find evidence that they lowered litter rates.

4.3.3 PROGRAM RECYCLABLES

Table 4-3 below identifies recyclable materials that are collected at curbside (as of 2019). These same materials are accepted at the City's Sanitation Convenience Centers. Table 4-3 also identifies materials that are not accepted by the City's single-stream program but are among the most common contaminants. As

detailed later in this chapter, the City has undertaken a number of initiatives over the years to reduce contaminants and improve recyclables quality.

Table 4-3 Philadelphia Single-Stream Recyclable Materials

Material	Philadelphia Single-Stream Recyclable Materials	Materials Not Included in Single-Stream Program
Metal	Aluminum, Steel and Tin Cans Empty Paint Cans Empty Aerosol Cans Aluminum Baking Dishes Jar Lids and Bottle Caps Clean Aluminum Foil	Pots and pans Batteries Coat Hangers Propane tanks Helium tanks
Glass	Brown, Clear and Brown Bottles and Jars	Light Bulbs Mirrors Windows and Auto Glass Glass Bakeware Porcelain and Non-Container Glass
Mixed Paper	Newspapers and Inserts Magazines, Brochures and Catalogs Junk Mail, Envelopes and Writing Paper Scrap Paper Paper Bags Phone Books Paperback Books Greeting Cards and Gift Wrap (non-metallic)	Greasy or Food-Soiled Paper Disposable Paper Plates, Cups, and Takeout Containers Tissues, Paper Towels and Napkins
Plastic Containers	Food and Beverage Containers, Detergent and Shampoo Bottles, Pump and Spray Bottles made from PET (#1), HDPE (#2), PP (#5), and #3-7 Resins	Styrofoam™ (Containers and Shipping/Packing Material) [1] Plastic Bags, Flexible Plastic Film and Pouches Drinking Straws Solo® Cups Microwavable Trays Unnumbered Plastics Garden Hoses, Wires
Cardboard	Corrugated Cardboard Shipping Boxes Clean Pizza Boxes Paper Towel Rolls Egg Cartons Dry Food Boxes	Greasy Pizza Boxes
Other		Aseptic Containers Food Waste and Liquids Construction Debris Needles and Syringes Clothing and Textiles Batteries Household Appliances and Electronics[2]

[1] Styrofoam™ is a brand name for polystyrene foam.
[2] Although not collected curbside as part of the single-stream program, electronics such as TVs and computers are collected and recycled year-round at the City's Sanitation Convenience Centers.

4.3.4 RECYCLING DROP-OFF CENTERS

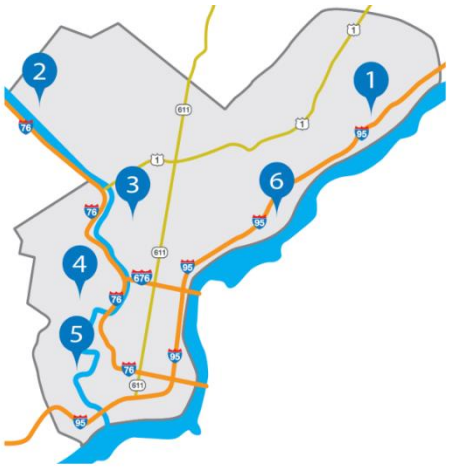
In addition to providing curbside collection, the City also operates a network of drop-off centers, called Sanitation Convenience Centers, for City residents. The Centers accept the same recyclables collected on the curbside routes and a wide array of other materials, including:

- Yard waste, accepted for recycling, and must be free of contamination and contained in paper bags only
- Automotive tires, limited to four per day
- Bulk items, large metal household items/appliances or items containing refrigerants, limited to two a day
- Christmas trees
- Collectible rubbish, up to six receptacles (or 12 bags)
- E-waste, including computers, monitors, televisions, and other computer-related equipment
- Latex- or water-based paint cans that are partially full can be solidified by adding an absorbent material such as "kitty litter" or newspaper prior to disposal
- Mattresses and box springs, unwrapped

Philadelphia residents can also pickup curbside recycling bins at the Centers. All locations are opened Monday through Saturday between 8 a.m. and 6 p.m., except on City holidays. Centers are strategically located throughout Philadelphia, as shown in Figure 4-4 below:

Figure 4-4 City of Philadelphia Sanitation Convenience Centers

1. **Northeast Philadelphia**
   State Road and Ashburner Street
2. **Northwest Philadelphia**
   Domino Lane and Umbria Street
3. **Strawberry Mansion Neighborhood 2601 West Glenwood Avenue**
4. **West Philadelphia**
   51st Street and Grays Avenue
5. **Southwest Philadelphia**
   3033 South 63rd Street
6. **Port Richmond Neighborhood**
   3901 Delaware Avenue



4.3.5 ELECTRONIC WASTE COLLECTION AND RECYCLING

The City accepts e-waste at all six of the City's Sanitation Convenience Centers. Since 2011, the quantity of e-waste collected (predominantly computers and TVs) has increased significantly. In Spring 2015, the City discontinued supplemental e-waste collection at HHW events. Also, in order to comply with the Pennsylvania Covered Device Act, the Streets Department no longer collects computers and TVs curbside to comply with the. These changes to e-waste collection are not expected to significantly impact the amount of e-waste collected in the City, since about 95 percent of e-waste was already collected through the Sanitation Convenience Centers.

4.4 RECYCLABLE MATERIALS PROCESSING SERVICES

The City's curbside recyclables, as well as those collected at the Sanitation Convenience Centers, are delivered to a Materials Recovery Facility owned and operated by Waste Management of Pennsylvania, Inc. Following an open and competitive procurement process, the City entered into a recyclables processing contract with Waste Management in July, 2019. The contract is a five-year term with two 1-year renewals at the City's option. The seven-year contract term (which includes two 1-year renewal terms) expires on June 30, 2026. The contract provides processing and marketing for recyclable materials collected curbside from households, dropped off at the City's sanitation convenience centers, and collected from City facilities. Recyclables received at the WM MRF are processed and sorted by commodity for marketing to secondary processors and end-users. This recyclables processing contract allows the City to deliver curbside recyclables to two locations:

- WM's Materials Recovery Facility (MRF) at the 5201 Bleigh Avenue in northeast Philadelphia.
- WM's transfer station at 3605 Grays Ferry Avenue.

The Bleigh Avenue MRF is one of the largest MRFs in the U.S. processing recyclables from neighboring Pennsylvania jurisdictions as well as from commercial and institutional customers. Recyclables delivered to the Grays Ferry location are loaded into trailers and transferred by WM to the Bleigh Avenue MRF for processing and marketing. While there are no minimum tonnage commitments for this contract, the City estimates that it will deliver approximately 104,000 tons of single-stream recyclables to WM during FY 2020.

4.4.1 RECYCLABLES PROCESSING PRICING AND MARKET TRENDS

The City pays a base, per-ton fee to WM for receipt and processing of recyclables. As is typical with MRF contracts, the per-ton processing price is adjusted based on changes to the overall market value of the City's recyclables stream. The City and WM track and calculate recyclables market values through monitoring of industry market index publications. To determine the market value of the recycling stream, the published market prices are multiplied by individual commodities' weighted average composition in the City's recycling stream. Higher recyclables market values generally result in a lower processing cost for the City, while lower market values can drive the processing price higher. This shared-risk approach is the standard approach to contracting for recyclables processing.

As is the case with virtually all U.S. cities, Philadelphia now pays to have its recyclables processed and marketed. For most of the 2000s the City earned net revenues on the sale of its recyclables, including a record $6.7 million in FY 2012. However, the economics of municipal recycling in the U.S. have changed dramatically in recent years, due to a number of global macroeconomic forces and policy actions, including:

- **Export Markets:** Recovered materials markets have undergone unprecedented changes during the past few years. Driven by an expanding economy the Republic of China was the primary consumer of recovered materials, importing about one-third of all U.S. recyclables from the mid-2000s until early 2018. Because the U.S. imports so many finished consumer products and materials, overseas shipping costs were minimal as recovered materials could be backhauled to China on returning cargo ships.

  Citing concerns over materials quality, as well as an interest in developing its own recovered materials infrastructure, in 2014 China instituted a program called Operation Green Fence which imposed inspections standards on imported recyclables. China followed this action up with its National Sword Policy in early 2018. Under National Sword, China has banned imports of many grades of recovered materials, restricted impart licenses, and instituted an extremely strict contamination rate of .5 percent (prior accepted contamination, or "outthrow" rates were between three and five percent).
- **Changes to the Composition of Recyclables Stream:** There has been a change in the makeup of the City's recyclables stream, most notably a decrease in the amount of paper and cardboard. This has

magnified the influence of recyclables that have low or negative market values, especially glass that has continued to have poor market value and plastics (particularly #3-7 plastics) for which record low crude oil prices have driven down market values. Contaminants, notably plastic retailer bags, have become more of a concern as well. The recycling stream is expected to continue to change, including continued decline in newspaper circulation and packaging light-weighting.

- **Increased MRF Operating Costs:** Operations and maintenance costs for MRFs have increased over the past 10 years through the advent of more complex single-stream processing systems. These include a combination of more capital-intensive sorting technologies such as optical sorting systems and advanced robotics, as well as a need to hire additional labor for sorting and quality control. Higher MRF operating costs are expected to be the "new normal".

The new restrictions on the primary export market have had a direct effect on Philadelphia's recycling program. The City's previous contract for recyclables processing was a four-year contract, initially with ReCommunity Recycling, a Charlotte, North Carolina headquartered recyclables processor who operated a MRF along Grays Ferry Avenue, until their acquisition by Phoenix, Arizona-based Republic Services in 2017. During 2018 negotiations for a new contract term, Republic proposed a pricing structure the City saw as disadvantageous, and which may have made the City's costs for processing recyclables among the highest in the U.S. This turn of events forced the City to temporarily divert curbside recyclables from households in four sanitation areas to the Covanta Waste-to-Energy facility in the autumn of 2018 and into March 2019. The City was able to enter into an emergency contract with WM for processing of recyclables from two sanitation areas.

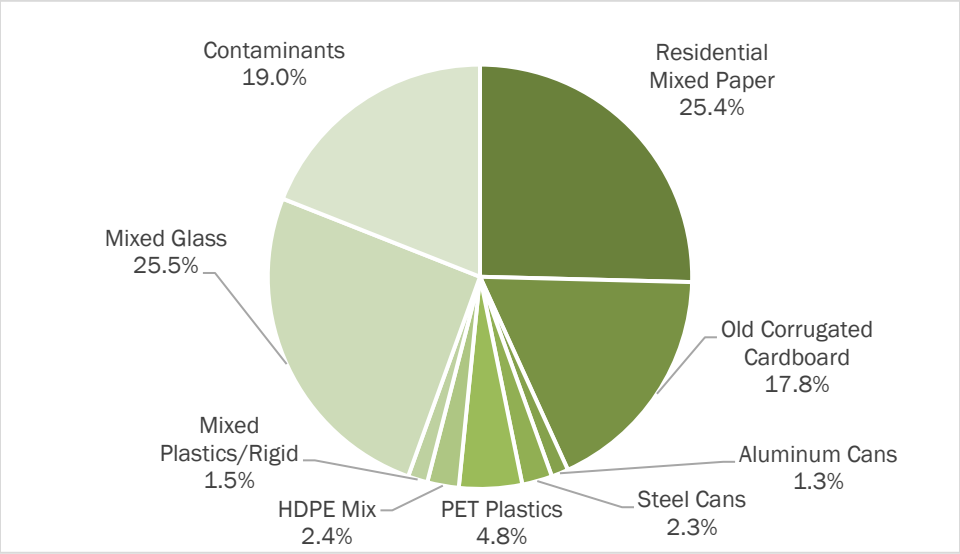
Because of the market forces described in section 4.4.1, the City (as well as virtually every other city in the U.S.) now pays for its recyclables to be processed.

4.4.2 CURBSIDE RECYCLABLES COMPOSITION

As described previously, the composition of the typical recycling stream has changed dramatically due to changes in packaging materials and design, the impacts of digital media, and increasing levels of contamination - particularly in single stream programs. Working with consultants, the City of Philadelphia regularly samples the makeup of its curbside recycling stream in order to monitor these changes and to identify the presence of contamination. The City's MRF contract pricing is also adjusted based on changes in the composition of the recycling stream.

The studies are designed to be statistically relevant and be representative of materials generation from across the City. The results have provided key insights into contamination levels, and are valuable tools for helping to shape and target messaging. Figure 4-5 below shows the rolling-average results from the City's regular recyclables composition sampling performed during the contract with ReCommunity.

Figure 4-5 Single-Stream Recyclables Composition (2015 – 2018)



Source: City of Philadelphia & ReCommunity Recyclables Composition Study Reports 2015-2018

The Streets Department plans to re-institute quarterly recyclables characterization studies as part of the WM contract.

4.5 RECYCLING AT CITY BUILDINGS AND FACILITIES

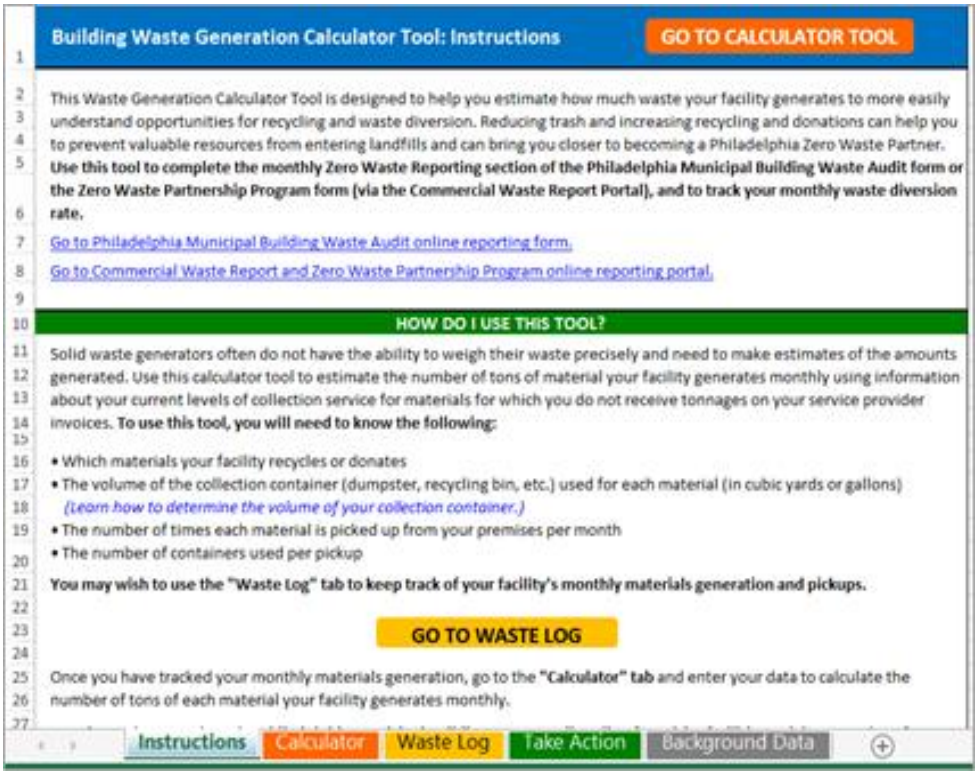
City agencies receive recycling collection from a combination of the Streets Department, private haulers, and in-house collections (e.g., parks, prisons). The Streets Department collects approximately 800 tons per year from City facilities. Recyclables collected from City buildings and facilities by the Streets Department are delivered to the WM MRF, along with the City's curbside recyclables. PPR uses its own crews and vehicles to collect recyclables from some of its parks and recreation centers for delivery to the WM MRF.

The City has made improvements to its education and outreach materials for recycling in City buildings and facilities over the years, including in 2013 and 2014, when the Streets Department distributed new recycling bins and issued a recycling guide to assist office managers. In 2017 the Zero Waste and Litter Cabinet launched the Municipal Building Waste Audit Program to benchmark waste management practices in City owned buildings and facilities, identify challenges, and provide departments with resources to help minimize waste generation. Resources include:

- A Waste Audit guide with information about program requirements, waste and recycling best practices, city recycling protocols, and options available to municipal departments for diverting different materials through practices like recycling, donations, and composting
- A list of tips for working with custodial staff
- A list of Philadelphia disposal, recycling, and donation options as well as E-waste recycling guidelines for city departments
- Standardized signage to hang above trash, recycling, & compost bins
- An up-to-date list of city-wide recycling and disposal contracts through the city procurement department

Some 523 buildings are required to participate, and as of 2018, 75 percent of them have submitted audit reports. Figure 4-6 below depicts the entry fields for the reporting tool.

Figure 4-6 City Agency Waste Generation Calculator



4.6 RECYCLING AT OTHER PHILADELPHIA-BASED INSTITUTIONS

4.6.1 PHILADELPHIA SCHOOL DISTRICT

With more than 200,000 students and nearly 250 schools and facilities, the School District of Philadelphia (SDP) is the 8th largest public-school system in the U.S. It contracts for waste and recyclables collections. The SDP developed and released its GreenFutures sustainability plan in 2016, which includes a number of solid waste and recycling goals. Figure 4-7 below outlines the consumption and waste management goals established in the GreenFutures plan:

Figure 4-7 GreenFutures Focus Area 2: Consumption & Waste

Action		Lead Agency	Partner	Target Completion Date
Consumption and Waste: Target - The District will increase its waste diversion from landfills by 10% over 5 years.				
9	Provide recycling program contact information and hierarchy of responsibilities.	OEMS	Facilities	2016
10	Provide exterior trash and recycling dumpster services and pick-up schedule to every school.	Facilities	OEMS	2017
11	Provide interior recycling and trash bins to every school.	Procurement	Facilities, OEMS	2017
12	Identify sustainability/recycling coordinators for every school.	OEMS	Facilities	2017
13	Communicate support for recycling program through reoccurring outreach from District leadership.	OEMS	Facilities	2017
14	Provide student green team incentives.	OEMS	Facilities, Procurement	2017
15	Reduce use of polystyrene trays and plates.	Food Services	Procurement	2018
16	Calculate rate of waste diversion (%) from landfill.	Facilities	OEMS	2020
17	Report each facility's recycling program compliance.	OEMS	Facilities	2020
18	Measure environmental footprint impact from waste reduction.	OEMS	Facilities	2020
19	Initiate an organics collection/composting pilot program.	Facilities	Food Services, OEMS, Procurement	2020
20	Identify Sustainability Coordinator Incentives.	OEMS	Facilities, Procurement	Ongoing
21	Provide training for facilities staff, students and teachers.	OEMS	Capital, Facilities	Ongoing
22	Conduct comprehensive and periodic waste stream auditing.	Facilities	OEMS	Ongoing

4.6.2 PHILADELPHIA INTERNATIONAL AIRPORT CYCLING AND WASTE REDUCTION EFFORTS AT PHILADELPHIA INTERNATIONAL AIRPORT (PHL)

Philadelphia International Airport (PHL) is the 20th busiest international airport in the U.S., taking in more than 30 million passengers each year. PHL, as well as the Northeast Philadelphia Airport (PNE), are managed by the City's Division of Aviation (DOA). In 2018, the DOA conducted a waste audit and developed a Recycling, Reuse, and Waste Reduction Plan. Informed by the waste audit results showing significant liquid contamination in recyclables, the DOA piloted a liquids collection sink to divert liquids. Annually, the DOA hosts Earth Day and America Recycles Day events to encourage recycling and conservation stewardship.

4.6.3 PHILADELPHIA PRISON SYSTEM FOOD WASTE COMPOSTING

The Philadelphia Prison System's (PPS) includes six correctional facilities in Northeast Philadelphia. The Riverside Correctional Facility and House of Corrections facilities have on site composting programs that process post-consumer food waste using wood chips and aerated bays. The composting programs are largely operated by inmates and finished compost is donated to community gardens, schools, churches and used on prison campuses and prison system's orchard program. As of 2017, the prison composting program composts over 44,000 tons of food waste annually saving approximately $28,000 in disposal fees.

Figure 4-8 below depicts one of the aerated composting piles found at the PPS facility on State Road in Holmesburg.

Figure 4-8 Aerated Compost Pile at PPS

4.6.4 PHILADELPHIA WATER DEPARTMENT (PWD) FOOD WASTE DIGESTER RFEI

In alignment with Philadelphia Code 10-722(4)(d) that was revised in 2015 to require commercial generators of food waste to separate food waste for beneficial reuse, PWD issued a request for information in 2017 to evaluate potential scenarios for the acceptance of pre-processed, liquefied food waste at one of the Water Pollution Control Plants (WPCPs).

4.6.5 SOUTHEAST PUBLIC TRANSIT AGENCY (SEPTA)

SEPTA is one of the largest regional transit authorities in the U.S., providing light rail, commuter rail, bus and trolleybus services within Philadelphia, and the neighboring counties of Montgomery, Delaware, Chester and Bucks. It has an annual ridership of approximately 300 million and has nearly 300 active stations. SEPTA issued its sustainability plan in 2017, which includes a 25 percent passenger waste diversion goal and an 80 percent waste diversion goal for employees and facilities by 2020. The FY 2017 rates were reported as 26 percent for passenger waste and 70 percent for facilities and employees. Total tons recovered were 6,623.

4.6.6 COLLEGES AND UNIVERSITIES

The City of Philadelphia has the third-largest concentration of college and university students on the East Coast. More than 120,000 students are enrolled in colleges, universities, trade and specialty schools within the City. The largest of these institutions include the University of Pennsylvania, Temple University, Drexel University, La Salle University, Thomas Jefferson University, and the Community College of Philadelphia.

Most, if not all, of these institutions have sustainability plans. However, they are responsible for arranging for and managing their own solid waste and recycling collections – information that is rolled-up into the commercial waste and recycling reports the Streets Department receives.

4.7 COMMERCIAL RECYCLING

The City of Philadelphia is home to more than 50,000 businesses. Businesses and institutions generated approximately 72 percent of Philadelphia's waste stream in 2018 (approximately 75 percent if C&D waste is counted).

Recycling by commercial establishments has been mandatory in Philadelphia since 1994. In addition to securing recycling collection service from either a private hauler (or the Streets Department, if eligible), businesses were required to complete and submit a recycling plan through the Streets Department's on-line database. Businesses were also required to post their completed plans in a conspicuous location. The posted plan was traditionally among the first things examined during inspections by the City's SWEEP officers.

As shown previously in Table 4-1, commercial recycling is well established in Philadelphia with an estimated annual recycling rate that has surpassed 50 percent in two of the last five years and is currently for 2018 was estimated to be more than 49 percent. However, the City understands that those results can be influenced by high-volume materials, such as appliances and scrap metals as depicted in Table 4-2. The City believes that there are still opportunities to increase commercial recycling, particularly in multi-tenant condominiums and office buildings where businesses have struggled to comply with recycling requirements. The City endeavors to build upon success to date by promoting, facilitating and influencing sustained and increased commercial recycling.

The City created a comprehensive Commercial Recycling Toolkit in 2014 to assist businesses implement and improve recycling programs. The toolkit outlines how to implement a successful recycling program, provides a checklist for compliance with the City's requirements, provides case studies for a broad cross section of business types, and provides other resources. The goal of the toolkit is to increase the total commercial business recycling diversion rate by providing a roadmap for businesses to implement and improve recycling. The toolkit was updated in 2017 as part of the City's Zero Waste and Litter goals and can be found here: https://cleanphl.org/commercialwastereport/

In 2017, as part of the City's Zero Waste and Litter initiatives, this requirement was changed, with commercial establishments now having to submit a Commercial Waste Report. This is a more comprehensive version of the recycling plan, and also provides businesses the opportunity to report on the amount of and types of waste and recyclables generated. Affected businesses include multi-family properties, retail establishments, restaurants, etc. For buildings that house multiple businesses, property managers are permitted to submit one form on behalf of all tenants. The reports must be submitted annually, by December 31st.

Streets Department and Zero Waste and Litter Cabinet staff have conducted outreach to the business community to advise them of the new requirements.

Other key business recycling requirements include:

- Businesses must recycle the same materials (at a minimum) accepted through the City's residential curbside recycling program;
- The Waste Report must be prominently posted next to other City of Philadelphia licenses;
- The form, as well as recycling requirements, must be distributed to employees;

- Businesses must provide an adequate number of recycling containers for employees and patrons. This means a recycling bin must be paired with each trash can;
- Recycling and trash containers must be properly labeled. The City makes downloadable sign templates and other outreach materials available through CleanPHL and the Streets Department's website.

Penalties for noncompliance can amount to $300 per violation per day.

4.8 CONSTRUCTION AND DEMOLITION DEBRIS

C&D materials generation varies based on the scale of the construction or development project, as well as based on the types of materials used. Typical C&D materials include lumber, concrete, sheet-rock or gypsum wall board, shingles, asphalt, and dirt and stone. Large scrap metal items, as well as corrugated cardboard are also typically generated.

Philadelphia has a robust C&D materials processing industry, with two C&D MRFs located in Northeast Philadelphia, and with more than 20 haulers providing collection services. However, C&D recycling tonnage reporting from some of these firms has been inconsistent in recent years, which has required City staff to estimate tons recovered based on data trends from prior years. Moreover, while C&D waste disposed is reported by county of origin to PADEP on a quarterly basis, it is generally accepted that some levels of C&D wastes are present in residential and commercial municipal waste.

The City recently instituted changes to its permitting process which will require applicants for construction, demolition or renovation permits to contract with and identify a hauling company to properly dispose of C&D materials from job sites. The Waste Hauler Form is downloadable and applicants can also access a list of licensed C&D hauling companies.

4.9 COMPOSTING IN PHILADELPHIA

4.9.1 RESIDENTIAL LEAF AND YARD WASTE COLLECTION

Another important City initiative is residential leaf and yard waste collection. The City hosts an annual, six-week fall program to collect and compost fallen leaves using mechanical leaf collections vehicles (City-operated leaf blowers and mechanical sweepers, with vacuum or other mechanical pickup), in designated areas that have a heavy accumulation of leaves. In addition, the City hosts a number of staffed and unstaffed drop-off locations for bagged leaves during this seasonal event. All bagged leaves must be in biodegradable brown paper leaf bags. During the 2018 fall collection program, the City collected approximately 1,750 tons of leaves.

Year-round, yard waste is accepted at all six of the City's Sanitation Convenience Centers and at the Fairmount Park Organic Recycling Center, which is operated by the Parks and Recreation Department. At the Fairmount Park Organic Recycling Center, residents can drop off materials for free, and commercial businesses can drop off materials for a tipping fee. Accepted materials:

- Leaves
- Grass clippings
- Brush
- Herbivore manure
- Wood chips

Yard waste is also collected City-wide as a part of the annual Philly Spring Cleanup events. In addition, the City is implementing a spring yard waste collection program, through which residents can drop off yard waste established drop-off locations used for the fall leaf collection program.

Figure 4-9 below shows organic materials processing in-action at the Fairmount Park Organic Recycling Center.

Figure 4-9 Organic Materials Processing at Fairmount Park

4.9.2 COMMUNITY COMPOSTING NETWORK

Philadelphia Parks and Recreation (PPR) and the Office of Sustainability introduced the Community Compost Network program in 2019. The program expands residential composting opportunities through composting residential food and yard waste to produce new soil. The City is seeking up to 25 sites hosted by community and civic organizations, schools, community gardens, and neighborhood spaces for community-scale composting systems. Proposals are expected to be received and reviewed in early 2020.

4.9.3 ORGANICS DIVERSION FEASIBILITY STUDY (2018)

The City conducted an Organics Diversion Feasibility Study in 2018 to determine realistic quantities of recoverable organics and to identify preferred diversion strategies. The study estimated the City could capture approximately 40,000 tons of food, yard waste, and compostable paper from the residential waste stream and approximately 60,000 tons from the commercial waste steam, or 100,000 tons combined on an annual basis. Organics processing capacity in and near the city is limited and no permitted facilities accepting food waste and/or compostable paper are located within 25 miles of the City. It was estimated that between $6 and $8 million in capital investments are needed to upgrade various processing sites to increase organics processing capacity by 60,000 to 120,000 additional tons per year. Key recommendations of the Study include:

- Improve the operations, equipment and processing capabilities of the Fairmont Park Composting Site.
- Add windrow composting to the NE Philadelphia Maintenance Shop Site
- Public Works Department to investigate feasibility of preprocessing food waste for anaerobic digestion
- Monitor the Organics Diversion Anaerobic Digestion project in New Jersey for potential future capacity
- Revise the City's ordinances and regulations to encourage additional organics diversion
- Install additional kitchen sink grinders
- Expand curbside collections of yard waste, food waste and compostable paper

- Verify the interest and processing capacity for a downtown commercial organics collection
- Reserve space at the Philadelphia Northwest Transfer Station for a organics transfer facility
- Encourage the growth of community/neighborhood organics programs
- The City should establish a sustainable source of funding tied to the residential, institutional, and commercial sector generators to support the costs of enhanced organics diversion and processing.

4.10 PUBLIC SPACE RECYCLING

4.10.1 PUBLIC SPACE RECYCLING AND WASTE (BIGBELLY PROGRAM)

Solar-compacting BigBelly units are present throughout the City, replacing wire trash receptacles that were contributing to litter problems. In many cases, BigBelly units have been installed side-by-side with conventional recycling receptacles. From 2009 through 2013, the City installed BigBelly units over a phased implementation period. Additional BigBelly units with recyclers have been purchased and installed through community partnerships with neighborhood associations and community groups. In total, over 1,000 BigBelly solar compactor units have been deployed within the City limits, with about half also featuring an adjoined recycling unit.

The BigBelly and recycler units can also serve as billboards to promote recycling, green initiatives and community and social responsibility. Working in partnership with the Philadelphia Mural Arts Program (MAP), students ages 10-14 created seven "Litter Critter" designs that were used to wrap 50 BigBelly units. The City, in collaboration with other organizations such as HACE (the Hispanic Association of Contractors and Enterprisers), have created other artwork for the BigBelly units. The intent of the creative designs is to encourage people to use the sustainable trash and recycling receptacles, reducing litter. Figure 4-10 below shows a typical BigBelly unit deployed in Philadelphia.

Figure 4-10 BigBelly Container

In November 2017 the City entered into a new media contract that includes advertising rights on 400 BigBelly units located primarily in Center City for a 10-year period and the provision of 275 new units with recyclers and foot pedals. The Streets Department has also reconditioned 125 existing units as a part of this effort.

The City conducted an analysis of the waste and recyclables collected as part of the BigBelly program in 2014. Based on the study, the City collects approximately 2,800 tons per year of waste and 320 tons per year of recyclables through the BigBelly program, representing approximately 10 percent diversion. Over a one-week period in September 2014, 38 samples of waste and 41 samples of recyclables from the BigBelly and recycler units were collected and sorted, to determine typical composition. The results show a capture rate of approximately 21 percent to 26 percent of targeted recyclables. The City can use these findings to assess and improve its public space recycling program.

4.10.2 Recycling at Philadelphia Parks and Recreation Centers

While all City offices and facilities are required to recycle the materials generated within their normal courses of business, the Streets Department, and Philadelphia Parks and Recreation (PPR) have also recognized the need for improved recycling opportunities for PPR patrons. Similar to the BigBelly containers deployed along the City's streets, recycling bins at PPR sites provide Philadelphians the opportunity to expand their recycling activities beyond home and work.

Recyclables generated at PPR are collected through a combination of PPR staff and equipment, as well as by collection crews and vehicles from the Streets Department. By 2018, more than 100 parks and recreation centers have expanded their recycling programs.

4.10.3 Event Recycling

The City of Philadelphia has been a national leader at planning and executing public events that achieve high recycling diversion rates. An early example of this commitment is the Philadelphia Marathon - a three-day race event that includes nearly 30,000 runners, 60,000 spectators, 3,000 "Waste Watcher" volunteers, 300 exhibitors and 200 staff. For the 2012 marathon, the City was awarded a "Gold" designation by the Council for Responsible Sport, a sustainable sporting event certification body. The 2012 marathon established the framework for how the City manages solid waste and recycling at large public events to this day.

Figure 4-11 Philadelphia Events Recycling Bins

Managing solid waste and recycling from large events is a multi-agency effort and requires coordination among the Managing Director's Office (MDO)'s Special Events Office, Philadelphia Parks & Recreation (PPR), the Streets Department, Philadelphia's Office of Sustainability (OOS), and the Zero Waste and Litter Cabinet. Since 2017 the City has required special event applicants to provide recycling services either through the Streets Department, or private haulers.

Special event applicants that elect to utilize City services are eligible to borrow three-bin stations for collection of recyclables, trash, and food scraps. Event applicants who wish to collect food scraps are typically required to locate and hire a private composting firm for management of these materials (the City makes a list of companies available).

The City publishes a comprehensive guide for how to plan and conduct Zero Waste events on the CleanPHL website. A link to the document can be found here: http://cleanphl.org/wp-content/uploads/2020/01/guidetozerowasteevents_brochure_2020.pdf

Figure 4-11 above shows an example of recycling, organics and refuse stations used at City special events, while a sampling of recent events, and their diversion rates, are shown below in Table 4-4.

Table 4-4 Philadelphia Zero Waste Events (2018-2019)

Zero Waste Events	Event Waste Diversion Rate
Philadelphia Marathon (2018)	88%
Philadelphia Parks & Recreation Holiday Party (2018)	89%
Broad Street Run (2019)	24%
Kensington Derby and Arts Festival (2019)	40%
Philadelphia Pizza Festival (2019)	50%
Clean Air Council Greenfest Philly (2019)	63%
Mount Airy Village Fair (2019)	76%

4.11 RECYCLING EDUCATION, OUTREACH AND SPECIAL PROGRAMS

The City supports and implements many different programs to enhance recycling efforts and to strengthen awareness and public education. Some of the key programs are summarized below:

4.11.1 RECYCLING PROGRAM BRANDING

Recycling has traditionally been supported through strong public outreach campaigns. During the program expansions in the mid-to-late 2000s, the City's outreach efforts focused primarily on encouraging resident participation and buy-in. Campaigns and branding that highlighted the increasing opportunities to recycle such as "Recycle-Full-Cycle: Home Base, Work Space, Every Place" were most common. Starting in the 2010s, outreach began to evolve towards a focus on recycling quality themes like "recycle right". "Get Behind Recycling, Know the Ins and Outs" was a campaign that encouraged recyclers to become more aware of acceptable and unacceptable materials. It has been followed-up with the "Take a Minute Before You Bin It" messaging.

The City continues to promote its recycling program to raise awareness and educate its residents, employees, visitors and commercial establishments in recycling opportunities, quality and other protocol. Examples of recent recycling program branding campaigns are shown below as Figure 4-12 and Figure 4-13.

Figure 4-12 No-Plastic Bags Messaging

Figure 4-13 Take a Minute Before you Bin It Poster

KEEP PHILADELPHIA BEAUTIFUL

Keep Philadelphia Beautiful (KPB) regularly coordinates recycling, waste management, and anti-litter outreach and programs with the Streets Department and other agencies. Some recent related activities include:

- Partnership with the City on the annual Philly Spring Cleanup Project
- Zero waste and "recycling right" community workshops
- Teacher and staff recycling program training for the School District of Philadelphia
- America Recycles Day events

4.11.2 SOCIAL MEDIA OUTREACH

Over the past few years, the City has significantly expanded its recycling outreach through the use of social media. The City maintains a comprehensive website, and routinely uses Facebook, Twitter and Instagram to communicate to residents and businesses. Activities and news relating to sanitation and recycling can be followed on Twitter and Instagram via @PhilaStreets and @CleanPHL; and on the City's websites. Links to these websites are shown below:

- Streets Department: http://www.philadelphiastreets.com/recycling

- Zero Waste and Litter Cabinet: https://cleanphl.org/

4.11.3 EDUCATION AND ENFORCEMENT

Education and enforcement are conducted through the City's SWEEP program (Streets & Walkways Education and Enforcement Program). SWEEP is a City-wide program created to educate citizens about their responsibilities under the Sanitation Code. SWEEP enforces the law against violators through street patrols by uniformed litter enforcement officers, computerized tracking of code violation notices, and adjudication of violations. Under the SWEEP program, specially trained civilian officers meet with the individuals responsible for the operation of businesses and apartment buildings to review responsibilities outlined in the Code and in Streets Department regulations. SWEEP officers work with residential communities to address problem locations. In cases of non-compliance, SWEEP officers issue warnings and citations.

The City has about 50 SWEEP officers, with about 70 percent of their work in the residential area. SWEEP officers assigned to Center City focus primarily on commercial enforcement.

4.11.4 PHILACYCLE

The Philacycle program was the City's recycling incentive and rewards program that began in 2017. The initiative was an extension of the original Philadelphia Recycling Rewards program with Recyclebank, which was phased-in as part of the curbside recycling program changes starting in 2008. The Philacycle program was suspended in mid-2019, in part due to increased recycling program costs precipitated by low recovered materials commodity prices.

4.11.5 GREEN SCHOOLS PROGRAM

The Green Schools Program was an initiative affiliated with the City's Recyclebank program. Here schools were able to receive grants of up the $2,500 for green projects, funded through Recyclebank rewards points donated by City residents. The schools submit an application for a specific project and grant amount, and if selected, the schools get teachers, parents, friends and the community to donate their Recyclebank points to fund the project. In 2015-16, the last year of the program, projects from 16 Philadelphia schools were funded at a level of $30,000. Past projects included recycling and composting programs, school gardens and greenhouses, beautification projects, and other educational programs and events. In the six years of the program Philly schools received more than $158,900 in grants.

4.12 SPECIAL PROGRAMS

4.12.1 PHILLY SPRING CLEANUP

The Philly Spring Cleanup is one of the city's initiatives that tackles illegal dumping, littering and pushes beautification. The Spring Cleanup is a one-day event, typically held in April, and throughout its history has cumulatively engaged more than 100,000 volunteers and removed nearly 12 million pounds of trash and collected more than 600,000 pounds of recyclables. During the 11th annual Philly Spring Cleanup event in 2018, nearly 20,000 Philadelphians participated in 779 cleanups throughout the City. Volunteers collected 642,000 pounds of trash, 164,000 pounds of tires, 12,800 pounds of yard waste and more than some 7,400 pounds of recyclable materials in the single-day cleanup program. The annual cleanup event is coordinated with City volunteers, with the City providing tools and supplies for registered projects. Collected materials are bagged and placed curbside for collection by the City. Host sites are allowed to keep the supplies provided by the City to maintain the areas after the cleanup event. Figure 4-14 below shows Mayor Kenney announcing the start of the 2016 event.

Figure 4-14 Philly Spring Cleanup

4.12.1 PHILADELPHIA MORE BEAUTIFUL COMMITTEE (PMBC)

The Philadelphia More Beautiful Committee (PMBC) is part of the Streets Department's Sanitation Division. It began in 1965 and has evolved into an urban environmental partnership that is one of the largest volunteer organizations of its kind in the country. Approximately 6,500 Block Captains are involved in neighborhood cleaning activities, working in cooperation with one of eleven PMBC representatives (Clean Block Officers or CBOs) and as many as 90,000 neighborhood volunteers. With two weeks advanced planning any organization such as a school, house of worship, civic association, etc., can arrange with the Streets Department for support for block cleanings. The City will supply equipment and pick-up the rubbish collected. Approximately 6,000 block clean-ups are supported each year, collecting 500 to 1,000 tons of debris annually.

Each year, the Streets Department holds a Block Captain rally, to celebrate and acknowledge their hard work and commitment and to provide workshops and education on current City plans and initiatives for a cleaner Philadelphia. The Department also hosts an annual Clean Block Contest.

4.12.2 LITTER EDUCATION

In December 2016, the Mayor signed Executive Order 13-16, creating the Zero Waste and Litter Cabinet to move the City toward a Zero Waste and litter-free future by 2035. The Cabinet released an action plan in 2017 to further this goal. This step builds on the Greenworks sustainability vision and represents actionable progress following a long history of anti-litter strategies. Most recent historical efforts addressing litter education and control are summarized below.

In 2010, the City launched the "UnLitter Us" movement to create awareness and understanding of the importance of a litter free city. Subsequently, the City transitioned the campaign to the message, "Pick It Up, Philly". The City uses a comprehensive outreach program for litter education, including traditional mass media (TV, radio, transit messaging), social media messaging (Facebook and Twitter), and community

outreach initiatives (educational presentations, rallies, and student training). To date, Litter Free Zones have been established covering more than 400 blocks, 10 schools, and eight commercial corridors. The Litter Free Zones are intended to empower neighbors to create a clean community, and to motivate school children to take an active role in combating the litter problem at their schools. The City also initiated a Business Ambassador Program to ignite the business community to do its part and spread the litter education message to customers. Currently, there are more than 160 Business Ambassadors in place.

In addition to the Streets Department, Core Network Members for the litter education program have included the Office of Sustainability, The Mayor's Office of Public Affairs, Philadelphia Parks & Recreation, City Year, Greater Committee Philadelphia Cares, City of Philadelphia Mural Arts Program, and the United Way of Greater Philadelphia and Southern New Jersey. Other partners include PhillyRising, SERVE Philadelphia, Keep Philadelphia Beautiful, Commerce Corridors, the Clean Air Council, InSinkErator, Recyclebank and the Carton Council.

4.13 ENVIRONMENTAL BENEFITS OF RECYCLING

Recycling provides raw materials to manufacturers and helps create green jobs, preserve natural resources, reduce energy consumption and reduce greenhouse gas (GHG) emissions. Although some of these benefits are difficult to quantify, the U.S. EPA's Waste Reduction Model (WARM) can be used to determine GHG emission reductions from the City's single-stream recycling program. Table 4-5 shows the estimated composition of the City's single-stream recyclables and the average annual quantities collected between 2014 and 2018.

Table 4-5 Philadelphia Single-stream Recyclables Composition and Quantities

Material	Estimated Percentage of Single-stream Recyclables	Quantity Collected [1] (tons, 2014-2018 avg.)
Residential Mixed Paper	25.4%	27,208
Old Corrugated Cardboard	17.8%	19,067
Aluminum Cans	1.3%	1,370
Steel Cans	2.3%	2,464
PET Plastics	4.8%	5,142
HDPE Mix	2.4%	2,571
Mixed Plastics/Rigid	1.5%	1,607
Mixed Glass	25.5%	27,315
Rejects/Residue	19.0%	20,352
Total	**100.0%**	**107,118**

Source: 2018 MSW Consultants Recyclables Composition Study
[1] Includes residential single-stream recyclables only.

Using this data as input to the WARM, along with other data and input assumptions as depicted in Table 4-6 below, the model calculates about 201,955 metric tons of carbon dioxide equivalents were avoided by the City's single-stream recycling program (compared to landfilling the materials). In addition, the curbside recycling program also helped reduce energy consumption equivalent to saving 1.5 million BTUs. This is equivalent to removing nearly 43,000 passenger cars from the road. The benefits achieved by the City's recycling program are even greater than this amount, since the single-stream recycling program is only about 10 percent of the total recycling achieved.

Table 4-6 Philadelphia Curbside Recyclables WARM Benefits

Benefit	Metric
Quantity Recycled	86,744 tons [1]
Net Reductions in Greenhouse Gas Emissions	55,079 Metric Tons of Carbon Equivalent (MTCE) 201,955 Metric Tons of Carbon Dioxide Equivalent (MTCO2e)
Net Energy Savings	1,532,025 Million British Thermal Units (BTUs)

[1] Actual tons recovered (less contaminants and processing residue).
Source: U.S. EPA Waste Reduction Model (WARM)-Version 15, May 2019.

4.14 ECONOMIC BENEFITS OF RECYCLING

While the end-markets and pricing challenges as detailed in Section 4.4.1 have had negative impacts on city and county recycling collection programs such as Philadelphia's, recycling still results in considerable accrued economic benefits.

Recyclables are commodities that replace or help minimize the use of raw materials, and are value-added – meaning there is economic activity created at each stage of a recovered materials life cycle, from collection, to processing, to secondary processing, remanufacture, and distribution. When compared to traditional forms of solid waste disposal, recycling and reuse creates many more jobs on a per-ton basis.

The Pennsylvania Recycling Markets Center (RMC), a Pennsylvania State University affiliated quasi-state agency charged with supporting and developing improved recovered materials markets in the commonwealth issued a report in 2017 that examined the economic impacts of recycling in the commonwealth. The following major categories on recycling activity were examined

- The core recycling sectors, including public and private collection operations, recyclables processing facilities, scrap yards, composting and mulching operations, and recovered materials brokers.
- "Downstream" sectors, which includes companies that further process, refine and convert recovered materials into new raw materials. Examples include glass beneficiation plants, paper and steel mills and converters, etc.
- The reuse and remanufacturing sectors which repurpose and recondition products that can still serve useful purposes. This includes thrift stores, C&D debris reclaimers, tire re-treaders and electronics refurbishers.

In total, the study identified almost found that in 2015, recycling in Pennsylvania supported nearly 176,000 direct and indirect jobs, $51 billion in materials sales, and $11 billion in wages. The study also found that the recycling marketplace contributed some $22.6 billion to the commonwealth's 2015 gross state product, and contributed $4.4 billion in federal, state and local taxes.

The RMC's report can be found by accessing this link: https://pennrmc.org/

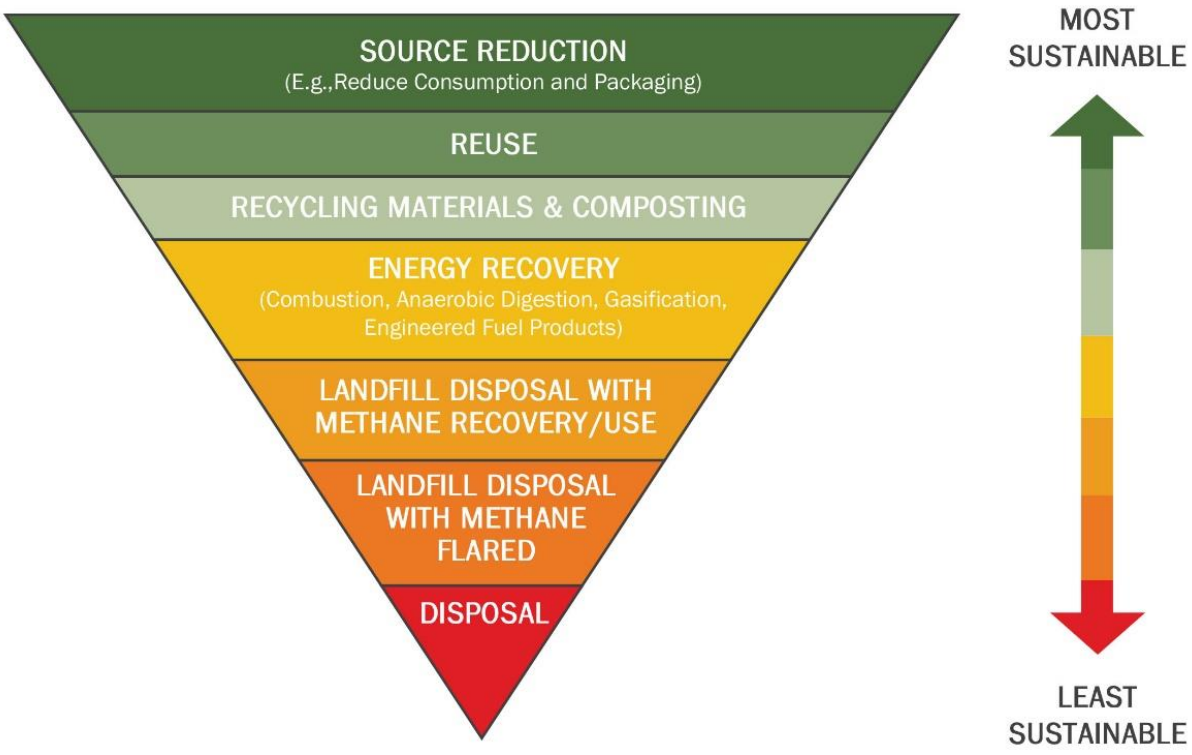
CHAPTER 5 – SELECTION & JUSTIFICATION

5.1 INTRODUCTION

This Chapter summarizes the selection process for the core elements of the City of Philadelphia municipal waste management program and provides justification for the selected programs. The City does not propose any new City-owned or City-operated municipal waste disposal or recyclables processing facilities for the 10-year planning period (2019–2028). Moreover, no major changes or deletions of recycling programs are proposed by the City for the planning period, and therefore, no detailed analysis of costs, benefits, advantages and disadvantages were evaluated or presented within this plan update. The City will continue to adapt to dynamic municipal waste market conditions and evaluate and advance feasible waste and recycling programs to the extent practical.

The City's Streets Department in collaboration with the Solid Waste and Recycling Advisory Committee (SWRAC), have adopted the U.S. EPA's Solid Waste Management Hierarchy as the primary basis for screening, prioritizing and selecting the preferred approaches to managing City-generated municipal waste. The hierarchy is shown below as Figure 5-1.

Figure 5-1 U.S. EPA Solid Waste Management Hierarchy



Source reduction is the highest priority and most preferred waste alternative is to minimize or eliminate waste generation. Source reduction generally includes actions and strategies that affect consumer products such as packaging redesign to reduce materials inputs, reduce waste or improve recyclability. Source reduction can also include educational initiatives designed to reduce consumption, such as encouraging bulk purchasing, bringing reusable bags instead of accepting single-use bags, encouraging backyard composting, etc.

Reuse is also at the top of the hierarchy and followed by recycling. Recycling converts recovered materials to products and includes composting. Recovery of energy, such as through anaerobic digestion, conversion of wastes to pelletized fuel, followed by mass combustion at Waste-to-Energy (WTE) facilities follow recycling. Landfill disposal is the lowest priority with preference to landfill disposal accompanied by energy recovery.

The Philadelphia SWRAC meets every-other-month and was engaged throughout the development of this Plan revision to provide public input for the City waste system. The City and SWRAC regularly discuss and evaluate goals, sustainability initiatives, programs, technologies, and resources to assure capacity is available to responsibly manage and process municipal waste.

The City's selected municipal waste management system for the 2019 – 2028 planning period also aligns with the City's sustainability goals and initiatives presented in the City's 2016 Greenworks plans referred to as "Greenworks Philadelphia". Greenworks Philadelphia addresses sustainability through five areas: **1) energy, 2) environment, 3) equity, 4) economy** and **5) engagement**. Greenworks Philadelphia establishes goals to: divert more than 70 percent of solid waste from landfill disposal, and to purchase and generate 20 percent of the electricity from alternative energy sources. The City Zero Waste and Litter Cabinet was formed in 2017 to advance initiatives supporting a Zero Waste and litter-free future and plays an important role in the selection of the City waste system.

5.2 WASTE SYSTEM OVERVIEW

The City's waste management system is made up of public and private waste generators, collectors, materials processors, and disposal facilities. Residential waste managed by the City's Streets Department includes MSW generated from single-family dwellings and multi-family dwellings of six units or less. Approximately 540,000 residential units are currently served by the Department, with collections organized into six sanitation areas with 13 districts. Under certain conditions, including upon application and subject to recycling requirements, residential condominiums and cooperatives larger than six units may be eligible for City collection.

Residential services also include the City's Sanitation Convenience Centers (drop-off centers). These centers accept recyclables as well as rubbish, e-waste, bulk items, yard waste, Christmas trees, automotive tires, mattresses, and box springs.

The Streets Department also provides a range of special collections for larger City facilities and Philadelphia Housing Authority (PHA) properties. These include major Police and Fire Departments, School District Administration Building, PHA Administration Building Main Library, Boat House Row, City Hall, Criminal Justice Center, and Municipal Services Building. All Police, Fire and Recreation buildings located along residential collection routes are collected weekly along with residential trash and recycling collection. The Department also provides municipal cleaning services including short dump collections, mechanical street cleaning, litter basket/BigBelly collections, and annual spring cleanups.

The City's programs and services are reinforced by a strong public outreach program and provision of extensive educational resources. The City-provided services are complemented by an open market system where the private sector provides a wide variety of material collection, hauling and processing services for waste, recyclables, organics, and special items. The City intends to continue its waste and recycling programs for the 10-year planning period.

In spite of volatile recyclables end-market challenges that have significantly increased processing costs since 2018, the City is committed to continually improving recyclable materials quality and adapting processing agreements and specifications to meet system needs and costs.

The City contracts with privately owned/operated facilities for recyclables processing and solid waste disposal (includes Waste-to-Energy and SpecFUEL™ production).

The City regulates commercial waste collections through ordinances and other regulations. Philadelphia has an open-market system for commercial and institutional waste, meaning that generators are required to contract directly with private haulers for collection and disposal services. For 2018, the City estimates that approximately 72 percent of municipal solid waste generated within Philadelphia came from commercial sources.

The City of Philadelphia has a proven solid waste system and programs portfolio that serves about 540,000 residential establishments, multifamily units and small businesses. The City facilitates a comprehensive and integrated waste management program that promotes proper disposal and recycling through education, technical guidance, ordinances and enforcement of residents, commercial establishments, City buildings, schools and public spaces. Moreover, as detailed in previous chapters, the City has consistently met and exceeded the 35 percent recycling goal required by Act 101 of 1988.

5.3 WASTE SYSTEM SELECTION

The City of Philadelphia elects to continue its waste system without significant changes and does not propose to develop, construct and/or operate any new major municipal waste disposal or recyclables processing facilities or infrastructure for the Planning period (2019 – 2028). Since no new major processing infrastructure or recycling programs are proposed by the City, no detailed analyses of costs, benefits, advantages and disadvantages of waste management alternatives are contained in this Plan revision.

The City will continue to evaluate and develop Plan initiatives and waste diversion programs with input from the SWRAC, City departments and other stakeholders. The following implementation documents and planning activities establish the basis for selecting and continuing the City waste system for the 2019-2028 planning period:

- **City of Philadelphia Municipal Waste Management Plan Revision (2019-2028):** Developed with input from SWRAC, the Plan describes the City waste system, defines planning goals and objectives, confirms disposal capacity assurance, and identifies initiatives encouraging the proper collection and processing of municipal waste and recyclables over the 10-year planning period.
- **Philadelphia Code Chapter 9-604 - Refuse collection, and Philadelphia Code Chapter 10-700 Refuse and Littering:** City refuse, recycling and litter codes are comprehensive and provide a sound of the City waste system that advances proper waste, litter and recyclable diversion practices through rules, regulations, requirements, enforcement of residents and businesses and authorization of City collection.
- **Waste Processing and Recyclables Processing Contracts for City-collected Materials:** Executed City municipal waste disposal/processing and single stream recyclables processing contracts to assure processing for all City-collected waste and recyclables through June 2026. Prior to contract expiration of any waste and recyclables processing contracts, the City shall procure waste and disposal capacity via open, fair and competitive municipal procurement processes to assure capacity for City wastes and recyclables is renewed and continuous. In light of significant changes in waste and recycling markets since 2018 due to decreased global demand in recyclables commodities and other factors that have increase processing costs, the City evaluates its waste and recyclables processing contracts with increased scrutiny to address measures to mitigate increasing costs, improve recyclables material quality, and hold processors accountable to meet contract specifications.
- **Inventory of Certified Municipal Waste Capacity for Privately Collected Municipal Waste:** To inventory the regional disposal and processing facilities and capacity available for City-generated wastes collected by private collectors serving Philadelphia, the City periodically distributes a Certification of Municipal Waste Disposal Capacity Form to regional processors. Owner/operators of regional disposal and processing facilities serving the Philadelphia area have sufficient capacity to for privately collected wastes and recyclables originating from Philadelphia for the planning period.

- **SWRAC Meeting Minutes and Background Materials**: Recorded SWRAC meeting minutes document the SWRAC meetings including agendas, presentation materials, open discussions, and Plan priorities and confirm the SWRAC is continuously informed on and engaged in the City's waste system.

5.4 JUSTIFICATION OF WASTE SYSTEM SELECTION

The City will continue its current waste system because it establishes an effective balance of City-provided waste and recyclables collection services that are complemented by a wide range of private sector collection and processing services for waste, recyclables, and special items. The waste system meets the disposal and processing capacity requirements for all City-generated materials through the combination of City contracts for waste and recyclable disposal and processing and processing capacity available through independent and free-market arrangements between private collectors and the regional waste and recyclables facilities serving the Philadelphia area. Proper waste management and diversion to recycling is encouraged and reinforced by comprehensive recycling awareness and public education programs and City codes and guidelines that target litter reduction and promote recycling. Adapting to changing markets, the City has a renewed focus on material quality, particularly for curbside single stream materials.

5.5 SELECTION OF PROCESSING AND DISPOSAL FACILITIES

5.5.1 SELECTED FACILITIES FOR CITY-COLLECTED WASTE AND RECYCLABLES

The City selected waste disposal/processing and recyclables processing services for City-collected materials using an open, fair and competitive procurement process. The RFP for processing services was publicly advertised and posted on the City's on-line procurement site, eContract Philly (https://philawx.phila.gov/econtract/) in 2019. The City evaluated and ranked facility proposals with these considerations:

- Superior ability or capacity to meet particular requirements of contract and needs of City Department and those it serves
- Eligibility under Code provisions relating to campaign contributions
- Superior prior experience of applicant and staff
- Superior quality, efficiency and fitness of proposed solution for City Department
- Superior skill and reputation, including timeliness and demonstrable results
- Special benefit to continuing services of incumbent, such as operational difficulties with transition or needs of population being served
- Benefit of promoting long-term competitive development and allocation of experience to new or small businesses, including those owned by minority or disabled persons or by women
- Lower cost including: the unit price per ton quoted for performing the work specified in the RFP, how that price would change over time, if at all, and the different travel times for refuse collection or transfer vehicles between point of origin and tipping locations proposed.
- Administrative and operational efficiency, requiring less City oversight and administration
- Anticipated long-term effectiveness
- Meets prequalification requirements
- Operational capability and evaluation of the respondent's transfer station(s), transportation system and disposal facility(ies) to assess their respective capability to efficiently handle the quantities proposed for the potential term of the contract. Evaluation of operational capability including evaluation of permitted capacity, facility design as it relates to ease of access, reliability of operation and

environmental performance, acceptable turn-around times, flexibility to adapt to potential changes in collection technology and the ability to accommodate night-shift, and Saturday and Sunday deliveries.

- Evaluation of the respondent's operating performance history and operating plan for the proposed transfer station(s) and disposal or processing facility(ies).
- Evaluation of respondent's proposed efforts to minimize the environmental impacts of the proposed transfer and disposal system infrastructure on the local community and region in general (including but not limited to the emission/discharge of carbon, methane, volatile organic compounds, metals, particulates, as well as limiting traffic and noise associated with the transfer and disposal system).

The City entered transfer and disposal/processing agreements for City-collected municipal waste and recyclables with **Waste Management of Pennsylvania, Inc. and Covanta 4 Recovery, L.P.** (**Appendix C**). These agreements commenced on July 01, 2019 and are for a period of four years with, at the City's option, three 1-year renewal periods. The seven-year contract terms, inclusive of all renewal options expire on June 30, 2026. There are 11 disposal and processing facilities including landfills, resource recovery facilities, and one alternative fuels facility under the purview of these two contracts (refer to Chapter 6). The disposal and processing capacity available through these agreements exceeds estimated annual quantities for City-collected wastes for the contract term. Prior to contract expiration, the City will conduct another procurement process to ensure adequate disposal and processing capacity is available for City-collected wastes and recyclables for the entire 10-year planning period.

Table 5-1 Selected Transfer and Disposal Facilities for City Collected MSW

Designated Facility [1]	Maximum Daily Quantity [2]	FY 2020 Disposal Rate [3]
Waste Management of Pennsylvania, Inc.		
Forge Transfer Station/SpecFUEL™ Facility/Core Organics Recycling	950 tpd	$67.53
Philadelphia Transfer Station and Recycling Facility	625 tpd	$67.53
Wheelabrator Falls Resource Recovery Facility	--	
Fairless Landfill	--	
Covanta 4 Recovery, LP		
58th Street Transfer Station	665 tpd	$65.70
Delaware Valley Resource Recovery Facility	270 tpd [4]	$58.68
Covanta Plymouth Renewable Energy		$63.69
Covanta Lancaster	–	
Covanta Camden	–	
Conestoga Landfill	--	
Rolling Hills Landfill	–	

[1] See Chapter 2 of this Plan for additional information on Designated Disposal Facilities, including identification of Alternate Designated Disposal Facilities.
[2] Subject to adjustment by the City.
[3] Subject to escalation by contractual formulas.
[4] Combined Maximum Daily Quantity for Delaware Valley Resource Recovery Facility and Covanta Plymouth Renewable Energy.

The selected disposal and processing facilities of the City waste system minimize landfill disposal in accordance with the City's sustainability goals in the City's Greenworks plan. Single-stream recyclables processing and Waste Management's SpecFUEL™ facility increase waste diversion capacity. The SpecFUEL™ facility processes selected or pre-sorted waste using mechanical and optical sorting equipment to recover recyclable metals, organics, plastics, and inert materials. The remaining materials

(primarily paper and plastic) represent the fuel product. The City estimates that between 200 to 400 tons of municipal waste from Philadelphia was delivered to the SpecFUEL™ facility for processing.

5.5.2 PROCESSING FACILITIES FOR PRIVATELY COLLECTED WASTE AND RECYCLABLES

Residential units (i.e., certain multi-family dwellings and condominium units) and businesses that do not receive City collection services utilize private waste and recyclable collection services. Privately collected waste is processed at private transfer facilities or transported directly to one of many disposal facilities serving the Philadelphia region. To inventory facilities with available capacity to dispose and process City wastes and recyclables collected by private haulers, the City periodically surveys regional processing facilities using a Certification of Municipal Waste Disposal Capacity Form. Based on completed Certification of Municipal Waste Disposal Capacity Forms received in 2015, there are 28 disposal and processing facilities with interest and capacity to accept municipal waste collected privately and originating in Philadelphia (Table 5-2). Four have expressed interest but did not complete the certification of capacity. In consideration of individual facilities to apply for permit revisions for additional capacity, there is sufficient disposal and recyclables processing capacity for privately collected materials generated by the City.

The City does not control how private haulers select transfer and disposal facilities, and usually this is an economic decision based on proximity to the facility and the tip fees. Private haulers operating in the City are encouraged to use the list of inventoried facilities that certified available capacity, but are not required to use only those facilities listed.

Table 5-2 Processing Facilities for Privately-Collected Waste and Recyclables (2018)

Facility Name	Permit Number	County (State)
Advanced Disposal Chestnut Valley Landfill	101419	Fayette (PA)
Advanced Disposal Greentree Landfill	101397	Elk (PA)
Advanced Disposal Mostoller Landfill, LLC	101571	Somerset (PA)
Alliance Sanitary Landfill	100933	Lackawanna (PA)
Blue Ridge Landfill	100934	Franklin (PA)
Commonwealth Environmental Systems, L.P.	101615	Schuylkill (PA)
Community Refuse Services Inc	100945	Cumberland (PA)
Conestoga Landfill	101509	York (PA)
Covanta 58th St Transfer Station	101477	Philadelphia (PA)
Covanta Delaware Valley Resource Recovery Facility	400593	Delaware (PA)
Covanta Plymouth	400558	Montgomery (PA)
Delaware Recyclable Products	SW-05/01	New Castle (DE)
Fairless Landfill	101699	Bucks (PA)
The Forge Transfer Station	101376	Philadelphia (PA)
FR&S, Inc dba Pioneer Crossing Landfill	100346	Berks (PA)
G.R.O.W.S. Landfill	101680	Bucks (PA)
IESI Bethlehem Landfill	100020	Northampton (PA)
Keystone Sanitary Landfill, Inc.	101247	Lackawanna (PA)
Lancaster Waste-to-Energy Facility	400592	Lancaster (PA)
Lycoming County Landfill	100963	Lycoming (PA)
McKean County Landfill	100361	McKean (PA)
Modern Landfill	100113	York (PA)
Mountainview Reclamation Landfill	101100	Franklin (PA)
Philadelphia Materials Recovery Facility (MRF)	Not required	Philadelphia (PA)
SpecFUEL™ Facility	WMGM037SE001	Philadelphia (PA)
The Philadelphia Transfer Station	10129U	Philadelphia (PA)
Seneca Landfill, Inc.	100403	Butler (PA)
Susquehanna Resource Management Complex	100758	Dauphin (PA)
Tullytown Resource Recovery Facility Landfill (1)	101494	Bucks (PA)
Wayne Township Landfill	100955	Clinton (PA)
Western Berks Community Landfill	100739	Berks (PA)
Wheelabrator Falls Inc.	400633	Bucks (PA)
York County Resource Recovery Center	400561	York (PA)

5.5.3 SELECTED ORGANICS PROCESSING PROGRAMS

In accordance with the waste management hierarchy used as a basis for considering and selecting the City's waste systems and programs, organics diversion for composting or anaerobic digestion is preferred over disposal. Source-separated organics are processed by a combination of City-owned facilities and private processors. The City-operated Fairmount Park Organics Recycling Center processes City-collected leaves (fall), yard wastes that are consolidated at City Sanitation Convenience Centers, and woody wastes collected by City crews maintaining the City's extensive park system. The City of Philadelphia Water Department

(PWD) manages anaerobic digestion facilities at its Northeast and Southwest Water Pollution Control Plants for digestion of sludge.

Biogas produced by the Northeast Plant is used to generate electricity, meeting up to 85 percent of the plant's electrical demand. Biogas produced at the Southwest Plant is used for all campus heating and to reduce the amount of natural gas purchased for thermal drying and pelletizing at a biofuel's facility. Organics collection services are currently available from several private entities serving Philadelphia, which are listed in the City's Commercial Recycling resources. The combination of City-operated and public organics collection and diversion programs and facilities as supplemented by organics disposal provides sufficient capacity for City-generated organics. The City evaluates organics management strategies on an ongoing basis but at this point does not propose to develop, construct or operate any new major organics processing facilities as part of this Plan revision.

As part of continually assessing organics diversion opportunities, the City performed a residential waste characterization study in 2017 that confirmed 30.3 percent of disposed City-collected municipal waste is organic food scraps, yard/woody waste, and non-recycled compostable paper. Based on the quantity of waste disposed by the Philadelphia residential sectors in 2018, nearly 149,000 tons per year of residential organic material may be generated in Philadelphia annually. Important public and private organics diversion initiatives that have been implemented and/or continue to be evaluated or developed are listed below:

- **Airport Organics Pilot:** In 2011 the Division of Aviation and six restaurants at Philadelphia International Airport participated in an organic waste pilot program to determine the feasibility of implementing an airport-wide composting program, which was partially funded with a grant from USEPA.
- **Food Grinders/Garbage Disposals:** In 2015, the City amended the building code to require all new residential construction include in-sink food disposers to increase organic material processed in PWD digestion facilities
- **Philadelphia's Prison Composting:** Organics from the prisons and other institutional, commercial and industrial sources are composted using aerated static piles. Finished compost is used on prison grounds and for organic farming, including an orchard of about 200 fruit trees.
- **The Dirt Factory:** A private composting facility and program at University City serving residents. Grass clippings, leaves, and certain food waste materials (e.g. coffee grounds, egg shells) are accepted for drop-off and composted using Earth Tubs.
- **The New Kensington Community Development Corporation (NKCDC):** A nonprofit organization dedicated to revitalizing the Kensington, Fishtown and Port Richmond neighborhoods in Philadelphia.
- **Council Resolution No. 140626 (2014):** Authorized the Joint Committees of Streets and Services and the Environment to hold hearings on the feasibility and benefits to the City of residential food waste recycling including its impact on environmental quality, hunger prevention, economic savings and job creation.
- **Council Bill No. 140903 (2015):** A mechanism including incentive for restaurants to use separate dumpsters for food waste.
- **City-wide Curbside Organics Collection:** In 2015 the Streets Department estimated up-front costs of up to $30 million for provision of curbside organics collection to approximately 540,000 residential units.

5.6 MUNICIPAL WASTE MANAGEMENT ALTERNATIVES

The City, SWRAC, Streets Department in coordination with other partner and stakeholders evaluate municipal waste management alternatives that could potentially be integrated into City practices to benefit municipal waste collection, disposal, transportation and processing. The following information highlights some of the municipal waste management alternatives evaluated by the City.

- **Mixed Waste Processing:** Mixed waste processing (MWP) can be used to supplement or replace conventional source-separated recycling programs. MWP recovers recyclable material from mixed waste and prepares the recovered materials for sale to secondary materials markets. A MWP facility is sometimes called a "dirty" MRF, advanced MRF (AMRF) or mixed waste MRF (MWMRF). MWP projects were more common in the 1990s, but the approach has experienced a resurgence during the past few years, in large part because of the advances in waste sorting technologies.

  MWP typically consists of a highly integrated system that combines mechanical processing with manual labor. Often there is a manual pre-sort to remove oversized materials, followed by mechanical operations to open bags, reduce material size, and meter materials into the sorting process. The sorting process separates materials by size, density and type, using manual sorting labor as well as screens, magnets, optical sorting, and other specialized equipment. Following the primary sorting process, MWP may include manual labor and additional mechanical processing to clean and consolidate recovered recyclables to prepare them for sale to markets (e.g., glass clean-up systems, balers, manual quality control). In addition to recovering recyclables, MWP facilities can be designed to separate an organic fraction for subsequent processing or used to produce an engineered fuel.

  While MWP can recover valuable recyclables that would otherwise be disposed, including fiber, plastic, glass, metal and other materials, the materials that are recovered are generally of lower quality than recyclable materials collected from source separation programs. Indeed, quality issues impact marketability and value of recyclables, and lower materials quality is believed to be a factor in the sustained drop in market conditions for source-separated recyclables during the past several years. Developers of MWMP facilities have failed to adequately address concerns over materials quality, particularly in light of recent market challenges.

  Moreover, there is a higher risk that materials recovered from MWP would not be used for highest and best use, but rather for low-end uses due to the presence of contaminants such as glass, food, and liquids. Therefore, MWP may have a more positive impact only <u>if used to supplement, not replace, source-separated recycling programs</u>. The City could consider MWP as part of a future competitive procurement for waste processing and disposal capacity.

- **Anaerobic Digestion:** Anaerobic digestion is a biological process that uses bacteria to decompose biodegradable organic materials (such as food waste, yard waste, and non-recyclable paper) in the absence of oxygen. The process results in biogas consisting primarily of methane and carbon dioxide. The biogas can be used to generate electricity, or it can be upgraded to pipeline-quality gas (biomethane) or other types of fuel (such as compressed natural gas). The remaining material that is not converted to biogas is called digestate. The digestate can be marketed as a fertilizer or soil amendment, typically after composting and curing. If there is not a market for the digestate, it can be gasified to extract the remaining energy value or be landfilled.

  Anaerobic digestion can result in residue requiring landfill disposal, both from pre-processing of the feedstock and post-processing of the digestate. The viability of an individual anaerobic digestion project will typically depend on the quantity and characteristics of organic feedstock, the ability to enter into a long-term fuel or power purchase agreement under favorable economic terms, the strength and stability of the market for beneficial use of digestate, and the avoided cost of disposal. variations of anaerobic digestion technology include: wet and dry systems; continuous and batch processing;

single stage or multi-stage processing; differing temperature profiles that support different types of bacteria, and various options for mixing (or not mixing) the feedstock before and during the digestion process. Anaerobic digestion operates within an enclosed tank, vessel or bunker, under controlled conditions and without the addition of air or oxygen. Most anaerobic digestion technologies use pre-processing to prepare the feedstock for digestion, including facilities that accept source separated organics for processing. Pre-processing may consist of opening and removing bags, removing contaminants (e.g., removing silverware and plastic from food waste), size reduction, moisture control, and blending.

Anaerobic digestion facilities are highly suitable for processing source-separated food waste or source-separated food and yard waste. The City could add or expand anaerobic digestion as part of a future competitive procurement to complement the City's waste processing and disposal services.

- **Point Breeze Biogas Project:** The Point Breeze Renewable Energy project entailed plans to develop a 22-acre heavy-industrial zoned property off of Passyunk Boulevard owned by Philadelphia Energy Solutions (PES) into a state-of-the-art anaerobic digestion facility.

  The project was being led by RNG Energy Solutions and was slated to include construction and operation of advanced anaerobic digesters to convert organic wastes into renewable natural gas and soil amendment products. The facility's design specifications were for it to receive and process some 1,100 tons of pre- and post-consumer organic wastes each day, which in turn would yield approximately 23,000 gallons of natural gas and 300 cubic yards of soil amendment.

  RNG and PES had signed an agreement to develop the plant in 2017 and RNG was in the process of obtaining permits from the City and PA DEP when a June 21, 2019 explosion and fire at PES' existing refinery crippled the plant. PES subsequently filed for Chapter 11 Bankruptcy protection. At the time of this writing discussions concerning the future of the Point Breeze Renewable Energy Project were being held among the parties in U.S. Bankruptcy Court. The City will continue to monitor developments if the project again moves forward.

- **Gasification:** A process that converts the carbon-bearing materials in municipal solid waste (such as paper, plastic, wood, rubber, and other organics) into a synthesis gas. The synthesis gas consists primarily of hydrogen and carbon monoxide. The synthesis gas can be combusted to generate electricity, or it can be converted to fuels (e.g. ethanol) or chemicals (e.g. naptha), which provides flexibility for optimizing project economics. The remaining inert materials (including glass, sand, and metals) that are not converted to synthesis gas can potentially be recovered for recycling or beneficial use, particularly if the process converts the inert material to a vitrified slag or aggregate material. Gasification can result in residue requiring landfill disposal, both from pre-processing of the feedstock as well as from residual inert material remaining after gasification and not otherwise vitrified (commonly called ash).

  The viability of an individual gasification project will typically depend on the quantity and characteristics of the feedstock, the ability to enter into a long-term fuel or power purchase agreement under favorable economic terms, the strength and stability of the market for beneficial use of residue, and the avoided cost of disposal. There are many variations of gasification technology including: pyrolysis (gasification in the absence of oxygen); gasification at differing temperature profiles, and plasma gasification. The variations offer differing advantages and disadvantages relating to synthesis gas yields, space requirements, energy needs, and other infrastructure needs. Many gasification technologies use some type of pre-processing to prepare the feedstock, including size reduction and recovery of recyclable materials.

  Gasification facilities also offer potential for application of systems to cost-effectively clean the synthesis gas prior to use, are amenable to application of certain highly efficient technologies for air

pollution control (e.g. selective catalytic reduction for control of nitrogen oxides), and may incorporate highly efficient power generation technology (e.g. gas turbine/steam turbine combined cycle configurations).

The City of Philadelphia could include gasification as part of a future competitive procurement for waste processing and disposal capacity to compliment the City waste system.

5.7 COLLECTION ALTERNATIVES

The City and SWRAC continue to discuss and evaluate waste and recyclables collection alternatives and practices that could be integrated into the City waste system and program to increase recycling and diversion from landfilling. Some of the collection alternatives that have been discussed by the City including through the development of its municipal waste management Plan revisions have included:

- **Pay-As-You-Throw (PAYT):** PAYT programs charge for waste collection based on the amount of material thrown away. These programs are also known as unit-pricing or variable-rate pricing programs, in which customers are typically charged a fee for each bag or container of waste generated, or pay fees based on container sizes. PAYT programs are usually paired with a recycling program that has no charge to the customer or a reduced charge compared to waste disposal. PAYT programs have been shown to decrease the amount of waste, by providing a direct economic incentive to reduce, reuse and recycle. They are also considered by some to be an equitable approach to waste management, charging customers for what they throw away. For these reasons, the USEPA supports PAYT programs and has developed a tool kit and other informational resources to assist communities implement PAYT. PADEP also provides information regarding implementing PAYT programs. PADEP reports that more than 200 municipalities in Pennsylvania have implemented PAYT and showcases certain boroughs and townships on their website. PAYT programs are more common in small to mid-size communities than large cities like Philadelphia. At Philadelphia's scale, the challenges like logistics, politics, limited ability of low-income residents to pay for waste collection services, enforcement, and increased illegal dumping are magnified. While not proposed to be implemented at this time, a PAYT program could be further considered in the future, consistent with the goal of this plan and the City to increase diversion from disposal.
- **Separate Glass Recycling:** The City's single-stream curbside recycling program includes mixed glass, consisting of household glass containers, bottles and jars (amber, flint and green). Glass currently makes up approximately 24 percent of the City's single-stream recyclables, as collected. Removing glass from single-stream recycling may result in a cleaner recyclable stream and produce clean glass cullet that meet specifications for remanufacturing glass into new glass bottles. Recently some Pennsylvania programs have eliminated glass collection from curbside recycling programs due to poor end-markets and contaminants. Other jurisdictions around the U.S. have also taken steps to either remove glass from curbside programs and direct recyclers to source-separated drop-off centers. The City will continue to monitor the impact and value of glass in the regional marketplace to determine if future changes to current collection practices are warranted.
- **Collection Containers:** The City provides 22-gallon recycling bins for collection of recyclables and also allows residents to use any household container (up to 32-gallons) with "RECYCLING" written on it. It is possible that providing larger bins (e.g., 32-gallons) with wheels and lids would increase recycling tonnage, improve the quality of recyclable material collected (i.e., less wet material from covered containers), and reduce litter. However, a large percentage of the City may be unable to accommodate a larger container, or containers with wheels. As part of Plan implementation, the City may consider providing larger recycling bins in neighborhoods where feasible and cost effective.

5.8 POLICY CONSIDERATIONS

This Plan incorporates the City's sustainability goals established in Greenworks Philadelphia (as updated in 2015). Greenworks Philadelphia establishes the City's vision and strategy to create a greener and more sustainable City. Greenworks Philadelphia addresses energy, the environment, equity, the economy and engagement. Integrated into this Plan are policy positions that are consistent with Greenworks Philadelphia, specifically including policies that increase diversion of waste from landfill disposal with engagement by well-informed and empowered citizens. As part of consideration of alternative solid waste management practices, the Streets Department and SWRAC discussed potential legislative and policy actions as opportunities to facilitate greater diversion of waste from disposal. Discussions included environmentally preferable purchasing, materials reduction (e.g., plastic bags), recycling space and capacity requirements for new commercial construction, bottle filling stations, and incentives for recyclables-reliant businesses. The Department and SWRAC have been following potential policy and legislative actions at the State and Federal level, including extended producer responsibility, end-markets development through the Pennsylvania Recycling Markets Center, and container deposit legislation. Considerations that will be evaluated during Plan implementation include:

- **City Procurement Process:** Executive Order 13-93, included in Appendix D, establishes as a goal the maximum feasible purchase of recycled content products and reusable or recyclable products, along with other related measures to encourage recycling and reuse through procurement policies. This executive order remains in effect, and under this Plan the City proposes to revisit and reinforce the procurement policies that favor the purchase of recycled and recyclable goods for use by City agencies.
- **Public/Private Partnerships:** The City will continue to engage with private entities that generate waste and that provide waste management and recycling services, to ensure City-wide collaboration and progress on achieving increased diversion of waste from landfill disposal. A key accomplishment is the City's commercial recycling toolkit, which was updated and reissued in July 2014. The toolkit outlines the recycling requirements for the commercial sector and provides best practices and case studies for successful recycling programs. The toolkit provides information on assessment tools to facilitate waste management and recycling activities, including information on conducting waste composition surveys and completing waste process mapping. As part of this Plan, the Recycling Office of the Streets Department will explore ways in which it can further assist businesses in utilizing the toolkit, perhaps by assisting with business and institutional waste audits, sharing data and other information and expertise, and/or providing other guidance to help businesses comply with the City's recycling requirements. Also, consistent with the City's policy position on continuing a sustained focus on education and outreach, these education efforts will include messaging to the commercial sector, including companies and manufacturers that are generators and service providers within the City's waste management and recycling program.
- **Zero Waste Strategy:** As further described in Chapter 13 of this Plan, SWRAC has established a Goals and Metrics Subcommittee that has discussed a number of considerations associated with recycling and waste diversion goals, including aspects of a Zero Waste strategy for the City. Subsequently, in December 2016 the Mayor signed Executive Order 13-16 creating the Zero Waste and Litter Cabinet and a plan was adopted with a goal of Zero Waste by 2035. Through continued deliberations by the Subcommittee and in collaboration with the Streets Department, Zero Waste strategy may include identification of potential programmatic, policy and legislative actions.

5.9 OTHER CONSIDERATIONS

- **Recycling Education:** The City has established and maintains a comprehensive and successful recycling program backed by a strong public outreach campaign. The City has developed many resources, initiatives and incentives to support its recycling program, including a residential recycling

rewards program, a commercial recycling toolkit, public space recycling (BigBelly), and a comprehensive anti-litter campaign. In addition, the City has employed integrated media approaches using transit advertising, television commercials, local media print advertising, and direct mail. Under this Plan, the City proposes to sustain its strong commitment to recycling education and outreach. The Streets Department has recently engaged in rebranding the program with the theme "recycle right" to promote smarter and more successful recycling efforts City-wide. Ongoing recycling education programs will seek to engage a broad range of stakeholders through clear, accurate and comprehensive messaging.

- **Implement a Recycling Bins Inspections and Tagging Program:** These are programs in which curbside recycling containers are inspected by canvassers for materials quality prior to collections. Recycling bins that are judged to contain excessive contamination are left with an "oops" tag or sticker that identifies the incorrect materials included. The bin tagging is typically performed during four-week cycles, and many cities elect to issue warnings for non-compliance or excessive contamination and then advance to non-collections for participants who do not modify behavior. Participants who are judged to have set recyclables out properly can be given a "Good Job!" tag.

  These programs are typically preceded by outreach campaigns and utilize app-based technologies whereby set-out data and resident compliance is tracked. This allows for insights into the effectiveness of the preceding program outreach and outreach efforts during the bin tagging program. The Recycling Partnership has been a proponent of these programs and has made grant monies available to cities and counties around the U.S. The programs have been piloted and implemented in a number of jurisdictions, including Phoenix, Arizona, Denver, Colorado, and more recently in Orange County, Florida (see Figure 5-2).

Figure 5-2 Recycling Bin Monitoring Oops! Tag

- **Reinstitute Quarterly Recyclables Characterization Studies:** As mentioned in Chapter 4, the City conducted quarterly composition studies of its residential recyclables stream as part of its MRF contract with ReCommunity. The quarterly studies were discontinued during the contract period with Republic Services but have been reinstituted as part of the City's contract with Waste Management.

Composition studies are used to adjust MRF contract pricing but are also used to better understand the changing materials stream and to target recycling program outreach and messaging.

- **Perform an Updated Waste and Recyclables Characterization Study:** The City's last residential waste composition study was performed in 2017. The City is planning to update its residential waste characterization data beginning in 2020 in conjunction with related projects, including the Pennsylvania statewide waste characterization study, and a recyclables capture rate study being undertaken by the City and The Recycling Partnership.
- **Continue Efforts to Divert Organics from Residential Waste:** As noted earlier in this Plan, between 200 to 400 tons per day of the City's residential waste is processed at the former SpecFUEL™[1] plant adjacent to Waste Management's Forge Transfer Station on Bleigh Avenue in Northeast Philadelphia. The City will continue to examine ways to recover additional volumes of organic materials (and other processible materials) through this operation.
- **Improve Commercial Recycling Reporting Data Gathering Methods:** The ability to obtain and process data is critical in all recycling programs – particularly so in those with zero waste goals. As noted in this Plan, the City has experienced challenges with obtaining timely recycling data and reports from many private generators and will continue to examine mechanisms to improve data gathering and analyses.

[1] The SpecFUEL™ is now operated as Continuus Materials.

CHAPTER 6 – LOCATIONS

6.1 INTRODUCTION

This Chapter identifies the locations of disposal facilities and processors for municipal waste and recyclables generated by the City of Philadelphia. The facilities (locations) include primary disposal and recycling facilities under contract to process City-collected materials and other waste and recyclable processors serving the Philadelphia region based on surveys conducted by the City Streets Department.

6.2 LOCATIONS OF PROCESSORS FOR CITY-COLLECTED WASTE

The City entered transfer and disposal/processing agreements for municipal waste and recyclables with Waste Management of Pennsylvania, Inc. and Covanta 4 Recovery, L.P. These agreements commenced on July 01, 2019 and are for a period of four years with, at the City's option, three 1-year renewal periods. The seven-year contract terms, inclusive of all renewal options expire on June 30, 2026. Table 6-1 lists the disposal facilities/processors included under City disposal agreements that are available to provide disposal services for City-generated waste and recyclables. Prior to expiration of any disposal/processing agreements the City enters a competitive procurement process to assure disposal capacity is secured via contracts with one or more permitted disposal/processing facilities for waste and recyclables.

Table 6-1 Locations of Designated City of Philadelphia Transfer, Disposal, and Processing Facilities

Facility Name	Permit No.	Facility Type	Location
Waste Management			
Fairless Landfill	101699	Landfill	Morrisville (PA)
G.R.O.W.S. North Landfill	101680	Landfill	Morrisville (PA)
Wheelabrator Falls Resource Recovery Facility	400633	Resource Recovery Facility	Morrisville (PA)
SpecFUEL™ [1]	WMGM037SE001	Alternative Fuel	Philadelphia (PA)
Covanta			
Rolling Hills Landfill	100345	Landfill	Boyertown (PA)
Covanta Plymouth Renewable Energy	400558	Resource Recovery Facility	Conshohocken (PA)
Covanta Delaware Valley	400593	Resource Recovery Facility	Chester (PA)
IESI PA Bethlehem Landfill	100020	Alternate Landfill	Bethlehem (PA)
IESI PA Blue Ridge Landfill	100934	Alternate Landfill	Scotland (PA)
York County Resource Recovery Center	400561	Alternate Resource Recovery Facility	York (PA)
LCSWMA Resource Recovery Facility	400592	Alternate Resource Recovery Facility	Marietta (PA)
LCSWMA Susquehanna Resource Management Complex	100758	Alternate Resource Recovery Facility	Harrisburg (PA)

[1] SpecFUEL™ is located at Waste Management's Forge Recycling and Resource Recovery Center

6.3 LOCATIONS OF RECYCLABLE MATERIAL PROCESSORS

The City contract for City-collected recyclables processing services is with Waste Management, Inc. This five-year recycslables processing agreement commenced on July 08, 2019 and includes up to two additional one (1) year extension periods. Recyclable materials collected or caused to be collected by the City from residential, institutional, public, and small commercial properties through the City's recycling program shall be delivered to Waste Management's material recovery facilities (MRFs) located at 3605 Grays Ferry Avenue and 5201 Bleigh Avenue in Philadelphia for processing. The primary MRF's including those under contract with the City and other processors serving the Philadelphia region are listed in Table 6-2. Some small, mid-size and specialty material processors serving the serving the region include John D'Orazio & Sons, PaperWorks Industries and others are not shown. The combination of City-contracted recyclables processing as supplemented by other regional recyclable material processors has capacity for City-generated recyclables.

Table 6-2 Material Recovery Facilities Serving Philadelphia

Facility Name	Company	Location
Philadelphia Material Recovery Facility	Waste Management [1]	Philadelphia
Republic Services King of Prussia Recycling Center	Republic Services	King of Prussia (PA)
TotalRecycle	J.P. Mascaro & Sons, Inc.	Birdsboro (PA)
Philadelphia Hauling & Material Recovery & Recycling Facility	Gold Medal Environmental	Philadelphia
Newman Paperboard Recycling Facility/United States Recycling	Newman & Company, Inc.	Philadelphia

[1] Under the 5-year processing and marketing contract with the City, it is estimated Waste Management will process approximately 100,000 tons of City-generated recyclables per year.

6.4 LOCATIONS OF PROCESSING AND TRANSFER FACILITIES FOR PRIVATELY-COLLECTED WASTES AND RECYCLABLES

To inventory facilities with available capacity to dispose and process City wastes and recyclables collected by private haulers, the City periodically surveys regional processing facilities using a Certification of Municipal Waste Disposal Capacity Form. Table 6-3 lists disposal facilities and processors of municipal waste and recyclables serving the Philadelphia region that responded to the 2015 survey confirming interest and capacity for City-generated wastes and recyclables.

Table 6-3 Disposal, Processing, and Transfer Facilities for Privately-Collected Municipal Waste & Recyclables (2015 Survey)

Facility Name	Permit Number	County (State)
Advanced Disposal Chestnut Valley Landfill	101419	Fayette (PA)
Advanced Disposal Greentree Landfill	101397	Elk (PA)
Advanced Disposal Mostoller Landfill, LLC	101571	Somerset (PA)
Alliance Sanitary Landfill	100933	Lackawanna (PA)
Blue Ridge Landfill	100934	Franklin (PA)
Commonwealth Environmental Systems, L.P.	101615	Schuylkill (PA)
Community Refuse Services Inc	100945	Cumberland (PA)

Conestoga Landfill	101509	York (PA)
Covanta 58th St Transfer Station	101477	Philadelphia
Covanta Delaware Valley Resource Recovery Facility	400593	Delaware (PA)
Covanta Plymouth	400558	Montgomery (PA)
Delaware Recyclable Products	SW-05/01	New Castle (DE)
Fairless Landfill	101699	Bucks (PA)
The Forge Transfer Station	101376	Philadelphia
FR&S, Inc dba Pioneer Crossing Landfill	100346	Berks (PA)
G.R.O.W.S. Landfill	101680	Bucks (PA)
IESI Bethlehem Landfill	100020	Northampton (PA)
Keystone Sanitary Landfill, Inc.	101247	Lackawanna (PA)
Lancaster Waste-to-Energy Facility	400592	Lancaster (PA)
Lycoming County Landfill	100963	Lycoming (PA)
McKean County Landfill	100361	McKean (PA)
Modern Landfill	100113	York (PA)
Mountainview Reclamation Landfill	101100	Franklin (PA)
Philadelphia Materials Recovery Facility (MRF)	Not required	Philadelphia
SpecFUEL™ Facility	WMGM037SE001	Philadelphia
The Philadelphia Transfer Station	10129U	Philadelphia
Seneca Landfill, Inc.	100403	Butler (PA)
Susquehanna Resource Management Complex	100758	Dauphin (PA)
Tullytown Resource Recovery Facility Landfill (1)	101494	Bucks (PA)
Wayne Township Landfill	100955	Clinton (PA)
Western Berks Community Landfill	100739	Berks (PA)
Wheelabrator Falls Inc.	400633	Bucks (PA)
York County Resource Recovery Center	400561	York (PA)

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CHAPTER 7 – IMPLEMENTING ENTITY

7.1 CITY OF PHILADELPHIA

The City of Philadelphia (City) is a first-class City of the Commonwealth of Pennsylvania that organizationally functions and provides services that are typical of local jurisdictions (cities, townships and boroughs) and counties.

Under the provisions of Act 101 and in accordance with PADEP guidance, the City is required to develop and update its Municipal Waste Management Plan. The City of Philadelphia Streets department is delegated the responsibility of Plan implementation, supplemented with support from other City departments as needed. The Philadelphia Streets Department is established by § 3-100 of the Philadelphia Home Rule Charter and has powers set forth in Title 11 and Title 12 of the Philadelphia Code. The City Streets Department is organized into three divisions: Sanitation, Transportation and Administration. Residential and eligible small-business solid waste services are delivered by or through the Sanitation Division. Solid waste and recyclables generated at Philadelphia parks and recreation centers are provided by a combination of the Streets Department and the Philadelphia Parks and Recreation Department (PPR). Plan implementation tasks including securing disposal and processing contracts for waste and recyclables require consent of City Council.

7.2 SOLID WASTE AND RECYCLING ADVISORY COMMITTEE (SWRAC)

In accordance with Act 101 and under Executive Order 15-08 the City Solid Waste and Recycling Advisory Committee (SWRAC) contributed to the development of this Plan and meets on an ongoing basis to review and advise on waste and recycling issues, policy, regulations, programs and Plan implementation.

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CHAPTER 8 – PUBLIC FUNCTION

8.1 PUBLIC FUNCTION

The City does not own or operate any disposal facilities (i.e. landfills or waste to energy facilities) for disposal or processing of municipal waste. The City does not own and materials recovery facilities for processing recyclables, except for the Fairmount Park Organic Recycling Center (Fairmount Park). Fairmount Park is a permitted compost facility that is owned and operated by the City and processes leaves, yard waste and wood waste. It is in the public interest of City to operate Fairmount Park to assure convenient and affordable processing services for organics, including processing of trees, stumps, and similar organic materials recovered as part of ongoing maintenance of City Parks and public spaces that benefit the City community. Processing and disposal of municipal waste and traditional recyclable materials (e.g. bottles, cans and paper) is expected to remain a private sector function during the planning period.

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CHAPTER 9 – IMPLEMENTATION DOCUMENTS

9.1 INTRODUCTION

The documents governing municipal waste management in association with this Plan are collectively referred to as "Plan Implementing Documents." In accordance with Title 25, Chapter 272.231 and Chapter 272.245, the Plan shall include ordinances, contracts and requirements used to ensure disposal capacity is available to process or dispose City-generated MSW over the 10-year planning period.

9.2 PRIMARY IMPLEMENTING DOCUMENTS

Primary Plan implementing documents refer to the documents under the responsibility of the City that are directly tied to assuring disposal capacity for City-generated municipal waste and the implementation of this Plan. Primary Plan implementation documents are summarized in Table 9-1 and are included in Appendices A and B. Within one year of Plan approval, these final and/or executed City Plan implementing documents shall be submitted to PADEP.

Table 9-1 Primary Plan Implementation Documents

Implementation Document	Description
Philadelphia Code Chapter 9-604: Refuse Collection	Provides authority to the Streets Department to enter garbage collection and disposal contracts and stipulates that any person providing private garbage, waste or recyclables collection must be licensed by the City. Licensed collectors are required to report to the Streets Department the type, amount, source and destination of materials handled.
Philadelphia Code Chapter 10-700: Refuse and Littering	Incorporates the City's original mandated residential recycling ordinance (for six or fewer unit dwellings) under Chapter 10-717 and provides provisions for prohibiting littering and dumping, the use of dumpsters, commercial sector waste management and recycling, and eligibility for municipal collection services. Defines the Department's authority to promulgate regulations and to conduct enforcement, including through penalties and fines.
Municipal Waste Processing and Disposal Contracts	Agreements effective from July 01, 2019 through June 30, 2026 ensuring reliable, cost-effective and environmental sound processing and disposal for all City-generated municipal waste.
Intergovernmental Agreement for Recycling Processing and Marketing	Provides request to The Philadelphia Municipal Authority by the Streets Department for the Authority to enter a Recycling Processing and Marketing agreement with a vendor (dated July 08, 2019).
Recyclables Processing and Marketing Agreement	The agreement between the Philadelphia Municipal Authority and a contractor (Re-community) for the processing and marketing of City-collected recyclable materials (dated July 08, 2019). Authorized via ordinance, Bill No. 190413, executed June 19, 2019. This Agreement commenced on July 8, 2019, and including its two one-year optional extension periods, expires on July 7, 2026.
Plan Resolution	Resolution executed by City Council marking the adoption of the Final Plan (2019 – 2028).

9.3 OTHER IMPLEMENTATION DOCUMENTS

In addition to the primary Plan implementing documents, the City has established and periodically updates codes, ordinances, and regulations pertaining to municipal waste management. These other municipal waste management implementing documents address a variety of municipal waste topic and are summarized in Table 9-2. These documents are not appended to this Plan but are available from the City Streets Department and or City website at: https://www.philadelphiastreets.com/sanitation/

Table 9-2 Other Implementation Documents

Implementation Document	Description
Streets Department Regulations Governing Municipal and Private Collection of Refuse	Streets Department regulations governing municipal and private collection of refuse, consistent with the requirements of Chapters 9-604 and 10-700 of the Code. Key provisions of the regulations include requirements for separating refuse and recyclable materials, container types and limits, collection schedules, special material handling, City collection services and fees, enforcement, and rights to initiate pilot programs and new programs.
Dumpster Ordinance (Bill No. 140903, March 2015)	Provides for the use of dumpsters for grindable garbage for private collection for composting, anaerobic digestion, or use as farm livestock feed. Allows reduced collection frequency of aerated dumpsters and specifies uses for licensed "recycling dumpsters".
Recycling Ordinance (Bill No. 150748, December 2015)	Amends Chapter 10-700 of the Philadelphia Code and allows for the Streets Department to issue updated rules and regulations and increase fines for non-compliance (with a particular emphasis on commercial recycling).
Residential In-Sink Food Disposers (Bill No. 150651, December 2015)	Specifies that in-sink food disposers be required as part of issuance of building permits for new residential construction.
Recycled Product Procurement Policy (Executive Order 13-93, 1993)	Establishes as a City goal the maximum feasible purchase of recycled content products and reusable or recyclable products.
Recycling Policy for Municipal Buildings and Employees (Executive Order 5-96, 1996)	Establishes requirements for recycling in municipal buildings and by City employees, including City agencies such as offices, departments, boards and commissions.
Solid Waste and Recycling Advisory Committee (Executive Order 15-08, 2008)	Establishes the Philadelphia Solid Waste & Recycling Advisory Committee (SWRAC), with provisions regarding duties and composition of the SWRAC. Affirms the City's goal to achieve a combined residential and commercial recycling rate of 50%.
Food Waste Recycling (Resolution No. 140626, June 2014)	Authorizes the Joint Committees of Streets and Services and the Environment to hold hearings on the feasibility, benefits and impacts of residential food waste recycling.
Zero Waste and Litter Cabinet (Executive Order 13-16, December 2016)	Establishes the Zero Waste and Litter Cabinet as an interdepartmental effort to increase waste diversion toward a long-term goal of Zero Waste, while combating litter and enhancing the cleanliness of streets and public spaces.

CHAPTER 10 – ORDERLY EXTENSION

10.1 ORDERLY EXTENSION

This Municipal Waste Management Plan (Plan) has been prepared by the City of Philadelphia Streets Department in collaboration with the City-established Solid Waste and Recycling Advisory Committee (SWRAC). The Plan is consistent with City codes, ordinances and programs. As required by Act 101, the Plan provides for the orderly extension of municipal waste management systems in a manner that is consistent with the needs of the Philadelphia area and is consistent with existing plans affecting the development, use and protection of air, water, land and other natural resources. This Plan takes into consideration planning, zoning, population estimates, engineering and economics relating to waste management services including recycling. To ensure the ongoing orderly extension of its municipal waste management system, the City Streets Department and Sanitation Division will continue to work with the SWRAC, its subcommittees, other City departments and the various program and system stakeholders to avoid interference with existing or proposed plans.

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CHAPTER 11 – METHODS OF DISPOSAL

11.1 METHODS OF DISPOSAL OTHER THAN BY CONTRACT

City-collected waste and recyclable materials are disposed or processed at facilities in accordance with contracts between the City and other parties (Appendix C). To ensure ongoing disposal and processing services and capacity for City-generated wastes and recyclables the City extends, renews or enters new contracts subject to the City's competitive procurement practices.

Municipal waste generated within the City but not collected or controlled by the City shall be addressed by the generator. The Philadelphia Code and corresponding regulations specify requirements for generators and collectors of municipal waste and recyclable materials. Private haulers are required to use permitted disposal facilities in compliance with Title 40 Code of Federal Regulations (CFR) part 258 Subtitle D requirements and the requirements of the Clean Air Act Amendments.

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CHAPTER 12 – NON-INTERFERENCE

12.1 NON-INTERFERENCE

Consistent with the requirements of Act 101, this Plan does not interfere with the design, construction, operation, financing or contractual obligations of any existing municipal waste processing, disposal, or resource recovery facility that is part of a municipal waste management Plan submitted to PADEP.

This Plan does not restrict the use of remaining permitted processing or disposal capacity, or capacity resulting from facility expansion. The City shall not interfere with the efforts of existing processing or disposal facilities to process or dispose municipal waste from customers with municipal waste originating outside the City provided these arrangements do not conflict with the executed disposal and processing agreements associated with this Plan.

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CHAPTER 13 – PUBLIC PARTICIPATION

13.1 SOLID WASTE AND RECYCLING ADVISORY COMMITTEE (SWRAC)

In July 2013 under Executive Order 15-08, the Mayor's office appointed a Solid waste and Recycling Advisory Committee (SWRAC) to meet the public participation and planning requirements for a substantial Plan revision. The SWRAC currently meets every other month facilitates public participation on an ongoing basis to support Plan implementation, including participation during Plan updates to satisfy Act 101 requirements. Voting member appointments are typically made on behalf of the Mayor through the Streets Department Commissioner.

Since late 2013 the SWRAC has had co-chairs who are responsible for developing the agendas (along with consultation from City staff), helping to prepare minutes and materials, and running the meetings. In addition to the appointed SWRAC members, the meetings are typically attended by a wide range of interested parties, which include representatives from environmental organizations, neighborhood associations, business groups, and staff from other City departments.

Moreover, since 2015 the SWRAC has two standing subcommittees that meet semi-regularly (Goals and Metrics Subcommittee and Organics Subcommittee).

The current SWRAC roster is detailed below in Table 13-1:

Table 13-1 Current Philadelphia SWRAC Roster

Name	Organization	Tenure
Fern Gookin, Vice President (SWRAC Co-Chair)	Revolution Recovery	2013 – Present
Kelly Offner, Executive Director (SWRAC Co-Chair)	Keep Philadelphia Beautiful	2018 – Present
Bob Anderson, Vice President of Business Development	Retrievr	2013 – Present
John R. Embick, Attorney at Law	Environmental Law	2013 – Present
Sofia Guernica, Program Coordinator	Philadelphia Office of Sustainability	2017 – Present
Salvatore Iadonisi, Sales Manager	US Recycling (Newman Paper)	2013 – Present
Sara King, Director of Sustainability & Project Management, School of Arts & Sciences	University of Pennsylvania	2018 – Present
Paul M. Kohl, PE, Planning & Research Manager	City of Philadelphia Water Department	2013 – Present
Francine Locke, Director of Environmental Services	School District of Philadelphia	2015 – Present
Scott McGrath, Director of Environmental Services	City of Philadelphia Streets Department, Sanitation Division	2016 – Present
Chuck Raudenbush, Government Affairs Manager	Waste Management, Inc.	2013 – Present
Maurice Sampson, Eastern Pennsylvania Director	Clean Water Action	2013 – Present
Vivian Van Story, Founder & President	Community Land Trust Corp	2013 – Present

Key non-member SWRAC meeting participants are shown in **Error! Not a valid bookmark self-reference.** below:

Table 13-2 Key Non-Member Participants

Name	Organization	Tenure
Gordon Burgoyne, Business Development Manager	E-Covanta	2013 – 2018
Laura Cassidy, Sustainability Coordinator	Philadelphia Prisons System	2013 – 2020
Amy Cornelius	Interested Party	2014 – 2020
Tamika Davis, Program Coordinator	Philadelphia International Airport	2015 – 2020
Michael Ewall, Coordinator	Energy Justice Network	2018 – 2020
Nic Esposito, Deputy Managing Director	Mayor's Zero Waste and Litter Cabinet	2017 – 2020
Megan Garner, Sustainability Coordinator	School District of Philadelphia	2015 – 2018
Neil Garry, City Planner	City of Philadelphia Streets Department, Sanitation Division	2018 – 2020
Mike Giuranna, Environmental Protection Specialist	U.S. Environmental Protection Department, Region 4	2013 – 2020
Ian Hegarty, City Planner	City of Philadelphia Streets Department, Sanitation Division	2013 – 2015
Adam Hendricks, City Planner	Philadelphia Water Department	2015 – 2020
Peter Karasik, Principal Consultant	EcoLogix	2017 – 2020
Christine Knapp, Director	Philadelphia Office of Sustainability	2016 – 2020
Daniel Lawson, Sustainability Manager	Philadelphia Parks and Recreation Department	2017 – 2020
Marisa Lau, City Planner and Acting Recycling Coordinator	City of Philadelphia Streets Department, Sanitation Division	2015 – 2018
Kyle Lewis, Recycling Director	City of Philadelphia Streets Department, Sanitation Division	2018 –2020
Andy Shea, Business Development Manager	RNG Energy Solutions	2016 – 2020
Logan Welde, Staff Attorney	Clean Air Council	2013 – 2020

Former appointed SWRAC members are detailed in Table 13-3 below:

Table 13-3 Former SWRAC Members

Name	Organization	Tenure
Phil Bresee, Director of Recycling	City of Philadelphia Streets Department, Recycling Office	2013 – 2016
Jeff Cardwell, Vice President for Facilities & Operations	Philadelphia School District	2013 – 2015
Andrew Dalzell, Executive Director	South of South Neighborhood Association	2013 – 2014
Michelle Feldman, Executive Director (SWRAC Co-Chair)	Keep Philadelphia Beautiful	2013 – 2018
Katherine Gajewski, Director	Philadelphia Office of Sustainability	2013 – 2015
Dan Garofalo, Environmental Sustainability Director	University of Pennsylvania	2013 – 2018
Joseph Otis Minott, Esq., Executive Director	Clean Air Council	2013 – 2016
Denis Murphy, Director of Commercial Corridor Development	City of Philadelphia Commerce Department	2016 – 2018
Mike Roles, Program Coordinator	Clean Water Action	2014 – 2015
Andrew Sharp, Deputy Director for Policy	Philadelphia Office of Sustainability	2013 – 2016
Debbie Zimmer	Dow Chemical Corp.	2013 – 2016

13.2 SWRAC MEETING SCHEDULE AND MATERIALS

SWRAC meetings are generally held on the third Thursday of the month, at 3 p.m., at the City's Municipal Services Building, which is across the street from City Hall.

Table 13-4 below identifies the key topics of the SWRAC meetings dating to late 2013. SWRAC meetings routinely include status updates on Plan preparation, legislative updates, identification and discussion of topics of interest and issues as raised by SWRAC members and City staff, and various announcements of events and activities related to solid waste management and planning activities. Appendix E includes SWRAC meeting minutes. SWRAC agendas, minutes, meeting materials, and other backup information are also available for review and download on the Streets Department's website at:

(https://www.philadelphiastreets.com/recycling/solid-waste-recycling-advisory-committee-swrac/meetings).

Table 13-4 Overview of SWRAC Meetings

Meeting	Key Topics
November 2013	• Discussion of SWRAC administration • Overview of solid waste planning, including Act 101 and PADEP requirements and the administrative history of Philadelphia planning
February 2014	• Presentations on recycling and anti-litter outreach campaigns • Presentation on the Business Recycling Toolkit

Meeting	Key Topics
March 2014	• Presentation on recycling at the Philadelphia marathon • Presentation on the Philly Spring Cleanup program • Discussion of SWRAC subcommittees
April 2014	• Presentation of solid waste and recycling data and metrics • Presentation on public space (BigBelly) waste and recycling program
May 2014	• Introduction to Greenworks Philadelphia • Presentation on solid waste management statistical compilation and reporting methodology • Presentation update on public space (BigBelly) waste and recycling program
June 2014	• SWRAC visioning meeting – facilitated group discussion to identify strategic opportunities and planning objectives
August 2014	• Follow-up to SWRAC visioning meeting – small group discussions on key topics identified in previous visioning meetings, including break-out sessions on: o Recycling programs and initiatives o Public participation o MSW management program and technologies o Implementing entity
September 2014	• Continued SWRAC group discussion of June and August visioning sessions (solid waste trends and issues) • Discussion of SWRAC short-term and long-term next steps
October 2014	• Discussion of City Council initiatives regarding plastic bag legislation and a food waste/organics hearing • Discussion of the leaf collection program • Update on residential recycling initiatives and programs, including the "Recycle Right" campaign and the new recyclable material processing contract
December 2014	• Review of City Council hearing on organics recycling • Discussion of commercial recycling regulations
February 2015	• Update on organics recycling activities, including a proposed organics recycling feasibility study and a City Council bill regarding dumpster licensing changes (re: organic waste) • Discussion on the status of recyclables end markets • Presentation on the Pennsylvania Recycling Markets Center (PARMC), including e-scrap industry challenges and the Covered Device Recovery Act • Discussion on the formation of a SWRAC organics recycling subcommittee
March 2015	• Presentation on end-markets for organics recycling
April 2015	• Presentation on the Philadelphia School District GreenFutures Sustainability Plan • Discussion of FY 2015 curbside recycling trends
May 2015	• Discussion of City Council bills pertaining to refuse/littering and single-use bags • Presentation on alternative technologies for solid waste disposal
July 2015	• SWRAC visioning meeting – facilitated group discussion regarding Chapter 5 of the Plan (Selection and Justification of Municipal Solid Waste Management Program) • Discussion of the development of a public participation strategy as part of the planning process
August 2015	• Follow-up to the July 2015 visioning meeting, including a review of SWRAC input and related discussion of potential strategic goals

Meeting	Key Topics
October 2015	• Presentation on macro-level recycling market trends • Presentation/update on Philadelphia curbside recycling tonnages and MRF pricing
November 2015	• SWRAC special meeting to discuss a City Council bill proposing to revise the Philadelphia recycling ordinance • SWRAC follow-up meeting with continued discussion/reconsideration of the proposed bill, followed by a SWRAC vote to support the bill • Establishment of a SWRAC Goals and Metrics Subcommittee
January 2016	• Presentation on the City's residential, multi-family recycling project
February 2016	• Reports from SWRAC Subcommittees • Remarks from the Office of Sustainability regarding pending updates to the Greenworks plan
April 2016	• Discussions regarding future focus on the City's recycling ordinance (commercial licensing and reporting) and residential regulations • Program updates, including Philly Spring Cleanup results, multi-family projects, the school district GreenFutures program, and the Prison System's composting program
May 2016	• Remarks on the GreenFutures Sustainability Plan release and recycling expansion in schools • SWRAC review of the Plan before release for public comment
June 2016	• Discussion of SWRAC comments received on the Plan
August 2016	• Presentation on Recycled Artist in Residency, a non-profit arts organization • Update on release of Plan for a 90-day public comment period
September 2016	• Public meeting with comments received on the Plan • Upcoming release of the 2016 Greenworks Sustainability Plan announced
October 2016	• Reports from SWRAC Subcommittees • Program updates, including outdoor recycling added at Parks and Rec facilities, leaf recycling, and school recycling outreach and education
December 2016	• Report from SWRAC Goals and Metrics Subcommittee • Discussion of next steps for Plan revisions after the public comment period
January 2017	• Presentation on the City's Zero Waste and litter initiative • Report from SWRAC Organics Subcommittee
February 2017	• Update on response document for comments received on the Plan • Update on Zero Waste and litter initiatives • Review of preliminary 2015 commercial recycling tonnages
March 2017	• Presentation on the Zero Waste Partnership Program under development by the Streets Department to incentivize waste reduction • Working group discussions on the Zero Waste Partnership Program and a Zero Waste definition and diversion framework
April 2017	• Various program updates, including Philly Spring Cleanup • Report from the SWRAC Organics Subcommittee • Continued discussion on the Zero Waste Partnership Program

Meeting	Key Topics
May 2017	• Report from SWRAC Organics Subcommittee • Continued discussions on Zero Waste initiatives, including defining and tracking Zero Waste in Philadelphia
June 2017	• Update on recycling outreach activities • Group activity to develop recommendations for the Zero Waste Partnership Program
July 2017	• Report from the SWRAC Organics Subcommittee on Philadelphia Water's RFI for pre-processed food waste • Presentation and training by the Mayor's Office of Policy, Legislation, and Intergovernmental Affairs on the City government and effective advocacy
September 2017	• Report from the SWRAC Organics Subcommittee on responses to Philadelphia Water's RFI • Presentation by the Streets Department on the Zero Waste Partnership Program • Recyclebank introduced Philacycle, a new program to reward residents for Zero Waste activities
November 2017	• Update on Philacycle launch and program activities • Update on the new state budget and implications for recycling • Updates on the Greenworks report and Zero Waste and Litter Cabinet
January 2018	• Staff presentation on results of 2017 residential waste composition study • Staff updates on Philacycle, Green Schools and on solid waste plan • Zero Waste & Litter plan updates • Subcommittee reports • SWRAC planning meeting discussion
March 2018	• Aero Aggregates (glass processor) presentation • Curb My Clutter textiles recovery program presentation (Bob Anderson) • Subcommittee reports • Ethics training for SWRAC members
May 2018	• Point Breeze Renewable Energy Project presentation (Andy Shea) • Staff updates on Philacycle and Zero Waste & Litter Plan • Update from Keep Philadelphia Beautiful • Subcommittee reports
January 2019	• SWRAC members discussion on roles, responsibilities and motivations • Staff presentation on Streets Department education and outreach campaigns (historical and future) • Staff updates on Philacycle program and commercial recycling reporting (Kyle Lewis and Neil Garry) • Subcommittee reports
September 2019	• Presentation by MSW Consultants on the required revisions to complete the Municipal Waste Management Plan, including the data corresponding to the revised Planning period (2019 - 2028) and the City's new municipal waste disposal contracts. • Update by SWRAC Organics Subcommittee on Community Compost Program and food waste composting programs.

Meeting	Key Topics
November 2019	• Update on the Education Campaign including review of contamination rates and community outreach.
January 2020	• Presentation on state of recovered materials markets by Bob Anderson from Retriever • Organics Subcommittee update • Zero Waste & Litter Cabinet update • KPB update including on PA litter study • Recycling outreach update
March 2020	• *Meeting postponed due to COVID-19 shelter-in-place order*
May 2020	• City updates re: service impacts from COVID-19 • Recycling collection schedule changes: City to switch from weekly recyclables collections to every-other-week recyclables collections, due primarily to budget restraints and operational challenges due to increased trash volumes as a result of COVID-19 related stay-at-home orders. • Zero Waste and Litter Cabinet update, including report that the office has been disbanded due to budget restraints • Update on City recyclables market prices • Organics subcommittee report • Pitch and Pilot program award • MSW Consultants update and presentation on MWMP

July 2020	• City staff updates on trash and recycling collection schedule delays
	  ○ Volume up 25 percent since COVID-19 lockdowns
	  ○ Collections running about one-day behind schedule across City
	  ○ Prisons have suspended composting due to COVID
	• Recycling Office updates:
	  ○ To perform capture rate study (The Recycling Partnership grant)
	  ○ Update on recyclables processing and contamination
	• Organics subcommittee report
	• Office of Sustainability update: ZW&L plan, municipal building audits, ZW business partnership, to be coordinated through OOS
	• Pitch & Pilot program update: 76 percent of materials are textiles; 24 percent are electronics
	• MSW Consultants presentation and receipt of comments on draft MWMP

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