

Section 10 Composting Organics

Organics are discarded materials that will decompose, such as yard trimmings, food scraps, compostable food-soiled paper, and untreated wood. Organic materials are the largest fraction of the discard stream, representing more than 40 percent of materials currently disposed in landfills.

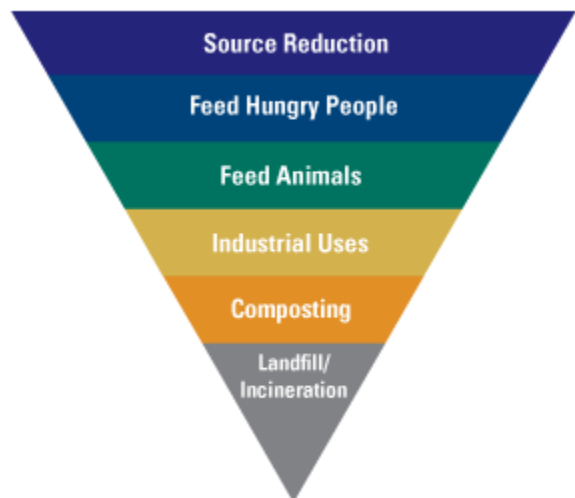
The desired goal for achieving significant diversion of organic materials requires many collection and processing opportunities (a buckshot approach), as opposed to a single solution (a silver bullet approach). Essentially, utilizing new and old technologies with new economic development opportunities, the Department can maximize the highest and best use practices to reduce the community's carbon footprint for handling organics.

A growing trend nationwide is toward a centralized composting process. Composting processes have evolved into different disciplines such as in-vessel composting, anaerobic composting, windrow composting and static-pile composting; all of which can handle large volumes of organics at single facilities. In addition, decentralized composting processes can reduce the carbon footprint while consuming organics in more localized situations that don't require large collection programs.

EPA Food Waste Recovery Hierarchy

Food is such a valuable resource that can be used to protect our soil and water or grow our next generation of crops. There are many higher uses for it to consider instead of disposing in a landfill or through bio-fuel (incineration). Both EPA and USDA recommend following the "food recovery hierarchy" below as the preferred options to make the most of excess food. The food waste recovery hierarchy comprises the following activities, with disposal as the last, and least preferred, option:

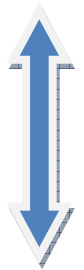
- Source Reduction – Reduce the amount of food waste being generated;
- Feed People – Donate excess food to food banks, soup kitchens and shelters;
- Feed Animals – Provide food scraps to farmers;
- Industrial Uses – Provide fats for rendering; oil for fuel; food discards for animal feed production; or anaerobic digestion combined with soil amendment production or composting of the residuals
- Composting – Recycle food scraps into a nutrient rich soil amendment
- Landfill – Disposal options are the least preferred.



Highest and Best Use Food Waste Composting Hierarchy

In the collection of residential food discards, feeding people and animals has been eliminated as options, as the collected food discards are too low grade for these purposes. For purposes of this Master Plan, the Department desires to utilize collected residential discarded food waste through a ‘highest and best use’ philosophy. A modified Food Waste Composting Hierarchy is noted below for City future planning purposes:

Highest and Best Use



Home-based Composting – Highest and best use of food scrap, with the lowest carbon footprint.

Humus & Mulch – Second highest end-use with minimal processing requirements.

Vermi-compost – Best processing of compost with the least energy requirements.

Aerobic Composting – Best central processing option with the highest end-use of compost.

Anaerobic Digestion – Final end-use disposal option with energy capture.

Landfilling – Disposal method that often creates unmitigated methane release to the environment.

Lowest End Use

Multiple Sources of Organics

Yard trimmings and food waste organics are generated through residential settings, commercial buildings, professional gardeners, food processors, restaurants, bars, school cafeterias, and landscapers. Given the large variety of sources, as well as the varied collection methods available, the Department desires to seek alternative methods to divert organics, in addition to traditional large-scale collection and processing methods. To develop and support various collection and processing needs, there is a need to explore future drivers for the utilization of organics.

Nutrition

In February of 2010, the United States Presidential Commission on Cancer released its final report, which included the recommendation to eat more certified organic foods. The report documents that our food supply now contain on average, only 40% of the nutrient density that they did 60-100 years ago. According to the report, organic matter is the key to our soil’s functionality and the long term health of plants and, thus, people. A community-based composting program can enrich local soils for proper nutrition density.

Water

The Lower Colorado River Authority’s *Soil Depth and Soil Amendment Specifications Background* guidance document stated that soil will hold about 1.5 quarts of additional water per cubic foot for every 1 percent increase in organic matter. On a county-wide scale, our soils are commonly thought to hold less than 1% organic matter, which would imply that only 25% of our annual rainfall can be absorbed by our soils. The remaining 75% of our annual rainfall is forced into runoff due to the absence of sufficient organic matter in our soils. An increase in soil organic matter of 1% results in increased rain water retention, and thus reduced irrigation requirements, of 0.5” per rainfall event. Most central Texas soils, including urban soils, are deficient in organic matter and cannot provide residents with a

consistent and reliable source of moisture for growing plants. Adding nutrient rich compost made from food scraps into our soils is one way to retain more water.

Carbon Footprint

Collection and landfilling organic materials has proven to be a fuel intensive process requiring a significant investment by the City in both equipment and labor. As fuel prices increase, price pressure on the cost of providing the service will increase. Options for reducing the carbon footprint of recyclable materials such as yard trimmings and food scraps can be addressed through a community-based composting program.

Green Jobs

The diversion of organic matter into local soils creates green jobs as well as local resiliency for both individual incomes and community economic development. Food organics and yard trimmings can be used to support local agricultural operations, including community gardens, through a system for distribution of these resources.

Green Barter

Green Barter provides a useful framework for the exchange of services and value among multiple parties that may not have the cash flow to support simple transactions. It increases the awareness of resources in the community. The City may be able to play a role in a green barter system by providing points, similar to frequent flier miles, along specific collection routes to residents for their aggregate collection volumes. Points could be divided among individual residents and then redeemed or donated. The technology exists using bar code technology to award bonus points to individuals for the diversion of food scraps to local agricultural operations. A local concept such as Green Barter could create significant new opportunities for diverting organics into ecosystem services, while addressing the needs of targeted social sectors such as low income and non-profit groups. Green Barter is further discussed in Section 24 Communications Plan.

New Technologies

Numerous new composting technologies are becoming commercially available in recent years. Composting worms have long been recognized for their ability to digest food scraps on residential and commercial scales in order to produce high-value worm castings. Innovations in Black Soldier Flies systems make it possible to use a naturally occurring local species to dispose of food scraps while producing a high value protein animal feed suitable for backyard chickens and/or tilapia. Food waste reduction machines and fermentation systems also offer promise for large and small scale generators, respectively. On-site medium scale in-vessel compost systems can produce quality compost within a few days of addition of food scraps, while greatly reducing the moisture content and hauling costs.

Through the stakeholder outreach process undertaken to develop the Master Plan, the Department identified several Zero Waste initiatives that will divert significant amounts of organic materials from landfills. These include policies, programs and infrastructure. The Zero Waste initiatives that address organic materials are described in this section.

10.1 Residential Backyard Composting and Community Gardens

Wherever possible, the lowest carbon footprint option for residential organic materials will be to utilize the organic materials on-site via back-yard composting for the improvement of the homeowner's soil while generating the maximum value. Soil organic matter is critical to a property's ability to increase shade, rainwater collection, and nutrient density, and thus reduce a household's operating expenditures, and increase the resiliency of their lifestyles.

Community Gardens

Community gardens will play an increasing role in the provision of locally grown, nutrient-dense foods. Distributed collection systems for food organics should thus be encouraged, making it possible for community gardens to serve as a source of high-quality food organics with the lowest carbon footprint. Community Gardens should receive additional merit in systems such as Green Barter or other social and environmental rewards systems that improve the connection between food waste generators and community garden food producers. Additional investment is planned in creating community gardens in target neighborhoods to further promote human food sustainability practices as well as proper composting of locally generated organics from the targeted neighborhoods. The Department will be an active participant in this inter-departmental Community Gardens effort.

Home Based On-Site Composting

The main barrier to increased adoption of composting systems in the single family segment remains education and awareness. Conventional composting systems are available at local garden centers and even some national retail home and garden stores. The next generation of composting systems has many advantages, but education and training will be required to help assist residents to have a positive experience which will endure and ensure no waste of food scraps.

The Department recognizes that most Home Owner Associations (HOA) currently ban home-based backyard composting. These association regulations are based on the false assumption that home-based composting draw un-welcomed animals or creates unsanitary conditions for the neighborhood. The Department will work with HOAs through an education program to encourage proper home-based composting techniques to address these concerns. The Department will also work with the Planning and Development Office to establish proper allowances for home-based composting.

Multi-Family Residential On-Site Composting

Multi-family residential settings generally do not provide garden space where organic materials can be transformed into nutrients, used for carbon sequestration, or used for improved rain-water holding capacity. On the other hand, multi-family settings can provide community green garden space to enrich the lives of its residents.

On-site apartment complex community gardens may be provided as options for improving the economic resiliency of residents through the production of their own gardens, as well as increase community engagement, environmental awareness and nutrition. New technologies facilitate on-site conversion of food scraps into potting soils without the use of yard trimmings. This enables people to garden in small spaces such as balconies and porches while also increasing their economic resiliency with respect to

food production. Most multi-family living arrangements have some small space in which to collect and compost food scraps using these new technologies.

The majority of multi-family and commercial locations employ professional yard maintenance companies to maintain their properties. These companies can provide a simple service of removing yard trimmings from the site. The city has an interest in facilitating the composting for these materials through the local privately operated composting operations. These materials provide an excellent source of high quality carbon for use in centralized composting facilities. Yard trimmings from multi-family and commercial locations could also be provided to local community gardens and farmers.

Additional training and education is fundamental for community engagement and for any organic collection program's success. These educational opportunities are described in Section 24 Communications Plan.

10.2 Sustainable Food Policy Board Recommendations

The Sustainable Food Policy Board provided input to the Master Plan process through a public meeting and in a letter dated December 3, 2010, as well as through a community website discussion posting in July 2011. The Board recommended that the City implement a comprehensive citywide composting program to make organic materials available to:

- Enrich the region's soil
- Strengthen sustainable food production
- Complete the food cycle; and
- Support Austin's Zero Waste initiatives.

The Sustainable Food Policy Board also stated that "an effective city-wide composting program will make valuable food waste and organic materials available to enrich the region's soil, strengthening sustainable local food production and completing the food cycle, while simultaneously supporting Austin's Zero Waste initiative."

In addition, the SFP Board recommended a strong education program to support the proposed comprehensive collection program. The SFP Board stated in its letter that the Austin City Council "take action to implement a clear, detailed and timely plan for a city-wide residential, commercial, and institutional composting program that builds on research and planning underway." The SFP Board recommended that the Department staff "integrate feedback from sustainable food production stakeholders specifically on the elements of the Master Plan that relate to composting."

The Department acknowledges the contributions of the Sustainable Food Policy Board, and has integrated all of its recommendations into this Master Plan. The Department proposes a comprehensive organics collection program for all single-family homes, as well as offering several programs and incentives for commercial and institutional sites serviced through private sector service providers. In addition, the Department recognizes the need for continuous public education on the procedures to compost, as well as the contributions and value that compost adds to our community.

In the process of developing policies and programs to address organic composting needs, the Department consulted with several interested stakeholders, the composting staff at Austin Water, and additional input from a composting subcommittee of the Sustainable Food Policy Board. Additional resources from the Department are identified in this section to support backyard composting and community gardens, as recommended by local organic experts.

10.3 Composting Education

Public awareness of the value of composting is still generally low. Consumer attitudes towards composting are weak, especially with regard to the goal of significant diversion of a community's food wastes. Education and workshops will continue to be essential to the City attaining its zero waste goals. To honor the principles of maximum value added, composting education activities will approach different segments with different solutions, such as residents of single family homes with yards versus tenants without yards, elderly and others unable to do on-site composting for soil production. Families with nutritional goals for gardening and community garden opportunities will be supported through inter-departmental support from the Department, as well as from Health and Human Services, Parks and Recreation.

Composting workshops are designed to connect education to action. The Department will provide complete and easy to understand information that compares a variety of systems in order to increase resident's commitment levels. The primary objective of the composting education and rebate program will be to educate residents on the various composting solutions available in the marketplace as well as more promotion on the benefits of composting. A variety of goals such as the production of soil amendments, destinations for food waste, and secondary products such as worms, animal protein or nutrient teas can provide residents with enthusiasm for adopting non-conventional compost systems.

School education is essential as well toward the proper efforts to compost. The Department is committed toward developing a curriculum-based school education program, as described in more detail the Section 24 Communications Plan. The re-designed school education program will include basic composting education and offer school-based projects to promote composting on school grounds. The Department will work in collaboration with the Austin Independent School District to develop such school-based pilots and demonstrations programs.

10.4 Compost End-Use Classification System

The development of a stronger retail market for compost will ultimately be determined by the public perception of compost quality. Education and awareness of the role of mulch and compost will be increased in order to support the marketplace for increased supply of compost materials.

Currently, Federal and State grading standards for compost are based on contaminant tolerance measurement systems. These graded systems permit compost for food grade production to contain acceptable tolerance levels of cadmium, chromium, copper, mercury, nitrogen, lead, and zinc. These

heavy metals are regulated to limit point and non-point sources of pollution to the water, soil, or air. However, this graded system is not consumer friendly, and generates distrust and poor public perceptions of compost quality. A new consumer-based classification system is needed to assure the public of safe use of the various grades of compost produced and distributed.

A system for identifying the appropriate compost for the specific application needs to be developed. This suggests that the Department support research and implement an end-use classification system as an advisory to end-users on the most appropriate usage for each grade of compost. Markets for the richest compost should be designated for food production in community gardens. Markets for the low end--use compost should be designated through the principle of appropriate use. For example, compost for roadside embankments may not be appropriate for food production. This system of positive controls for the quality of organics would provide significant support to compost producers and quality assurance to consumers.

The Department supports the implementation of a system for the classification of compost with a goal to increasing local sales of compost to residents. Such a system would also support the commercial marketplace by providing export opportunities beyond the Austin area for compost produced from city food organics and yard trimmings.

End-use classification should follow the Highest and Best Use principles of Zero Waste. There are several quality end-use classifications that can support the following consumer products:

- Sustainable organic food production
- Back-yard food gardens and community gardens
- Farm soil amendments for food production
- Mulch for trail surfaces
- Non-food flower beds and community flower gardens
- Soil water retention and growing medium for landscaping
- Topsoil and turf dressing
- Roadside embankments

To develop and implement a consumer oriented compost end-use classification system, the Department will work closely with the US Composting Council, a non-profit composting organization. The US Composting Council (USCC) provides support for generators of organic residues, compost producers, policy-makers, regulators, professionals and product users for the purposes of advancing the industry. The USCC is involved in research, training, public education, composting and compost standards, expansion of compost markets and the enlistment of public support. The USCC provides resources, educational materials, training, networking, and career advancement opportunities for professionals and all those affiliated with the composting and organics recycling industry. USCC members include compost producers, marketers, generators of organic residues, policy makers, regulators, equipment manufacturers, product suppliers, academic institutions, public agencies, nonprofit groups and consulting/engineering firms. More information can be found at www.compostingcouncil.org

10.5 Composting Incentives

Beginning in 2010, the Department initiated a new composting incentive program. The new program offers \$75 rebates to customers who purchase a home composting unit. By expanding the program, the desired goal will be to reach at least 10% of customers within 10 years, adding one percent impact each year. In addition, the Strategic Initiatives Division will undertake the following tasks to increase on-site and neighborhood composting:

- Develop a master composter and junior composter certification program;
- Partner with the City’s Climate Protection Program to develop a method for customers to document energy and water savings from composting;
- Partner with Austin Energy (AE) to revisit requirement of using Dillo Dirt™ for the AE Green Building certification;
- Coordinate with Watershed Protection to include training for xeriscaping into the composting training program;
- Partner with Watershed Protection to engage home owner associations in removing limitations of home-based composting;
- Engage multi-unit complexes to encourage them to develop on-site composting efforts, or adopt valet services to pickup recycling and composting in addition to trash and recycling;
- Engage in partnerships with restaurants and food processors to support increased food organics diversion; and
- Partner with Austin Independent School District to support composting pilots and demonstrations on various school properties.

Cost and Diversion Estimates for Composting Incentives

Initiative	Year of Initiation	Initial Year of Full Implementation	Initial Capital Costs	Annual Costs	Annual Diversion Tons
Compost Rebate Program	FY11	FY12	\$0	\$50,000	
Compost Public Education	FY13	FY14	\$0	Included in Communications Plan section	
AISD Compost Education & Pilots	FY13	FY14	\$0	Included in Communications Plan section	
End-Use Classification System	FY13	FY15	\$0	\$50,000	
Multi-Family/Commercial Organics Education	FY14	FY15	\$0	Included in Communications Plan section	
Multi-Family & School-based Pilots and Demonstrations	FY14	FY16	\$0	\$50,000	

Resources for Composting Incentives

One additional staff position is required to coordinate, promote and market the composting organics program and providing training in neighborhood and on-site composting and xeriscaping. Program costs for this initiative are based on backyard compost bin rebates at \$75 per household and 10% participation of approximately 182,000 households at 1% participation growth per year for 10 years.

Implementation Tasks for Composting Incentives

Task	Lead Responsibility	Participants	Schedule (FY)
1. Assess and refine new composting incentives program; expand program	Strategic Initiatives Division	Compost incentive participants	FY 12
2. Develop compost program outreach materials; present new public education on household and community garden on-site composting	Strategic Initiatives Division	Residential and commercial generators	FY 12
3. Increase training sessions to include community gardens and garden stores on on-site composting.	Strategic Initiatives Division	Community and neighborhood groups, residential and commercial generators	FY13 and ongoing
4. Initiate Master Composter and Junior Composter certification program.	Strategic Initiatives Division	Parks and Recreation	FY14 and every 6 months ongoing
5. Develop End-Use Classification System	Strategic Initiatives Division	US Composting Council	FY13
6. Initiate Multi-Family & School-based Composting Pilots and Demonstration Projects	Strategic Initiatives Division	Residential and commercial generators	FY14
7. Reassess and refine compost incentives program	Strategic Initiatives Division	Generators, composting facilities, and compost end-users	Every five years

10.6 Organic Collection Systems

The Department provides collection services for single-family households and some multifamily and commercial customers. Most collection services provided to multifamily and commercial customers are provided by private sector service providers. Through implementation of the Zero Waste initiatives described in this section, 30 percent of organic materials will be directly diverted by the City and 70 percent of the organic materials will be diverted by non-profit and private sector service providers.

Role of the City

Because the Department directly controls only a portion of the organic materials generated citywide, the City will have the most impact on increasing diversion of organic materials through new policy drivers. In future phases of the Universal Recycling and Composting Ordinance (URCO), the City will require diversion of organic materials by residential and commercial generators and at City offices and facilities. In future phases of the Event Recycling Ordinance, the City will require diversion of organic materials at all special events. In addition, the City will register all organic service providers that haul within the City limits. These policies are further described in Section 21 Policies and Ordinances.

Many of the Zero Waste initiatives directly affect the diversion of organics materials. The Department will initiate several new programs to divert organic materials, including:

- Expanding its compost incentives program to encourage the development of backyard and on-site composting;
- Initiating weekly compost trainings at community gardens and implement a junior composter and master composter training program (these programs can be implemented by Department staff or through non-profit and private sector contractors);
- Increasing diversion of organic materials by providing wheeled carts to all of its customers for the collection of yard trimmings and other compostable materials;
- Initiating a pilot program to collect yard trimmings, food scraps and compostable paper. Based on the results of this pilot, the Department will roll-out the new organics collection program citywide;
- Transitioning to on-call collection of brush and large volumes of yard trimmings that are generated seasonally; and
- Providing outreach, commercial technical assistance, and community-based social marketing initiatives.

If there is a service void and no private sector service providers are willing or able to provide the organic collection service, the Department will also provide for collection of organic materials from multifamily and commercial generators. Based on input from multifamily and commercial generators and private sector service providers, the Department will evaluate whether it will be necessary to expand organics collection beyond the Department's current customer base. If needed, the Department could contract for services for specific generators, such as those located in the Central Business District or for small multifamily complexes that are not able to attract a service provider on the open market. The

Department could also expand its operations beyond its current customer base if deemed necessary by the City Council.

The Department will support the work of the non-profit and private sector service providers through:

- Outreach and commercial technical assistance;
- Community-based social marketing initiatives, including pilot programs, focus groups, surveys to discover barriers, contaminants to address, and incentives to change behavior; and
- Large-scale campaigns to change public perception and behavior.

Public education regarding composting organics is further discussed in Section 24 Communications Plan.

City Infrastructure

The Department will work consider developing an organics processing pilot at the closed City of Austin FM812 Landfill. The pilot will evaluate the feasibility of adding food scraps and compostable paper to the composting program. Based on the results of the pilot, the City will consider expanding the composting facility on a clean site at the closed landfill to co-compost yard trimmings, food scraps, compostable paper. A TCEQ permit will be required for this activity. Based on feedback from the City's stakeholders, the Department will develop standards for the production of several end-use classifications of compost that does not incorporate biosolids, expanding the availability of high quality compost for certified organic growers. The goal is to utilize this site for experimentation and research. The Department will rely on private compost processors to participate in these studies and incorporate the new classification system into their operations. It is not the intent of the Department to expand its operations so as to infringe on private composting operations. It is the intent of the Department to spur new research and development to enhance organics processing and use.

Dillo Dirt™

"Dillo Dirt™" is a compost made by Austin Water Utility since 1989. It was the first program of its kind in the state and one of the oldest in the nation to successfully integrate treated biosolids with other organics in a composting operation. All yard trimmings collected curbside across the City by the Department, as well as some treated sewage sludge from Austin Water, are combined and composted to create Dillo Dirt™. The heat generated in composting (130 to 185 degrees Fahrenheit) is sufficient to virtually eliminate human and plant pathogens. After active composting over a month, the compost is "cured" for several months, then screened. The finished Dillo Dirt™ meets all Texas and EPA requirements for "unrestricted" use.

Not only is Dillo Dirt™ used to enhance local soils, but it generates jobs as well. Most of the revenue from sales of Dillo Dirt™ are received by private vendors who sell to the public at retail prices of \$30 to \$35 per cubic yard. Dillo Dirt results in sales revenue of an estimated \$1.4M annually for local businesses, in addition to approximately \$400,000 in revenue to the City.

Role of Non-Profit and Private Sector Services Providers

There is a strong and growing private sector infrastructure for organics diversion in Austin. Service providers in Austin have developed expertise in assisting organics generators to manage organic materials internally and segregate organic materials for collection.

Non-profit and private sector service providers are expected to collect and process organic materials generated by multifamily complexes; commercial establishments such as restaurants, mobile food vendors, and food processors; special events; and City facilities requiring dumpster service.

Service providers will also:

- Develop compost capacity at large scale composting operations and community or neighborhood scale facilities;
- Provide technical assistance to organics generators; and
- Assist with on-site composting and training.

10.7 Department Organic Collection Services

The Department currently provides weekly collection of residential yard trimmings in containers and bags provided by the customers. Additions to the yard trimmings program in FY15 will include:

- Providing collection carts for yard trimmings and other organics;
- Adding food scraps and compostable paper to the yard trimmings collection program;
- Providing a choice in the size of the containers (64 and 96 gallons); and
- Expanding recycling and organics collection to all Solid Waste Services customers.

The Department will conduct a pilot program to insure that yard trimmings commingled with food scraps and compostable paper can be adequately composted for end-use markets. The pilot program is needed to test collection efficiency, public acceptance and processing capabilities for the materials generated. The pilot will also gauge contamination issues, such as plastic bags, utensils, and other non-organic material unintentionally collected in the carts. In addition, the pilot will include tracking and reporting of tonnages received in the pilot area to compare with the tonnage results on the regular yard trimmings routes to assess additional diversion potential of the food scraps and compostable paper fraction.

The Department will implement a two-year roll-out of the organics collection program to evaluate the staffing and routing requirements needed to fully implement the yard trimmings and food scrap diversion program.

Education and outreach materials will be sent to the organic collection customers to describe the program features and the types of organic materials that can be put in the yard trimmings carts. Additional information and tips to make the program more user-friendly and effective will be included as well. For example, customers will be encouraged to keep the yard trimmings cart lid secured during the week to prevent pests, empty kitchen food scrap containers directly into carts, or wrap food scraps in newspapers or place them in paper bags if they prefer. These steps help minimize odor and other related challenges. Prior to launching the program citywide, the Department will conduct customer surveys to assess program acceptance and identify customer concerns.

Cost and Diversion Estimates for Organics Collection

Initiative	Year of Initiation	Initial Year of Full Implementation	Initial Capital Costs	Annual Costs ¹	Annual Diversion Tons
Organics Pilot Projects	FY11	FY12	\$0	\$50,000	Varied & unknown
Organics Residential Collection	FY15	FY16	\$12,000,000 (carts & trucks)	\$800,000 (operator salary and vehicle operations)	50,000 In FY16

¹ Annual cost includes staffing resources.

Resources for Organics Collection

Current yard trimmings collection routes include:

- 10 collection routes each day, 5 days per week, weekly collection
- 10 rear-loader trucks with 25 cubic yard capacity each and 2 operators per truck
- 30,000 tons of yard trimmings are collected annually

Conversion to organics collection (mixed yard trimmings and food scraps) will require:

- 12 collection routes each day, 5 days per week, weekly collection
- 12 side-loader trucks with 28 cubic yard capacity each and 1 operator per truck
- 50,000 tons of yard trimmings and food organics will be collected annually

Existing staff resources will be used to implement organics collection pilot. New side-loader collection vehicles will replace retiring rear-loaders. New 64 and 96 gallon wheeled green carts will be distributed to all residential customers. The Department will transition its rear-loader trucks to the Clean Austin Program for brush and bulk item collection and replace them with side-loader trucks suitable for servicing wheeled carts.

After the pilot program has been implemented, the City will conduct a routing efficiency analysis to determine the appropriate number of routes that will be needed to roll-out organics collection citywide. The City will also determine whether any efficiency could be realized from reducing some of the trash collection routes and converting resources to organics collection.

Implementation Tasks for Organics Collection

Task	Lead Responsibility	Participants	Schedule (FY)
1. Conduct research on adding food scraps and compostable paper to yard trimmings collection program; identify	Strategic Initiatives Division	Stakeholders and citizens	FY 12

Implementation Tasks for Organics Collection

Task	Lead Responsibility	Participants	Schedule (FY)
neighborhoods for pilot program			
2. Conduct pilot program on adding food scraps and compostable paper to yard trimmings collection program; conduct follow-up stakeholder education; evaluate results; assess and refine program	Collection Services Division Strategic Initiatives Division	Operations Support Division Finance Division Customer Service Division	FY 13 – FY 14
3. Acquire equipment and implement adding food scraps and compostable paper to yard trimmings collection program citywide	Collection Services Division	Strategic Initiatives Division Operations Support Division Finance Division Customer Service Division	FY 15 – FY 16
4. Assess and refine food scraps and compostable paper collection program	Collection Services Division	Strategic Initiatives Division	every 5 years ongoing

10.8 Processing Options

Agricultural Based Composting

The goal of expanding compost processing opportunities, for purpose of this Department Master Plan, is to divert food scraps from the landfill to achieve the City of Austin zero waste goals. When utilized appropriately, composting provides the added benefit of improving the quality and quantity of food produced locally. Agricultural operators control the lands that produce our local food and are able to convert organics into improved soils for food production. The highest value added opportunity for organics is the production of the highest quality foods.

Attention should be placed on the cumulative volumes of food organics diverted to any individual location. A reasonable goal for soil improvement, as opposed to illegal dumping or storage of food scraps, would be for a maximum of 10% Soil Organic Matter levels in the accessible soils of an agricultural producer.

Traditional Facility Based Composting

The organics collection programs provided through the Department and private sector service providers will generate mixed organic materials that will need to be processed. Currently the Department works with Hornsby Bend to process its collected yard trimmings. The Department will continue to work with Hornsby Bend for organics processing and continued operations as appropriate, based on the outcome of this pilot and others to be conducted concurrently. The Department will provide experimental demonstrations of compost processing of food organics at the closed FM812 city landfill.

At this time there are two other permitted private entities available to handle these organic materials and process them into a suitable compost material for marketing. These facilities include Texas Disposal Systems and Organics by Gosh. There are other private entities with various levels of permits and resources that may be able to receive this material in the future.

In the medium-term though FY20, the City's organics processing capacity is anticipated to be met through aerobic composting. The Department will also consider future implementation of emerging technology, such as anaerobic digestion, for treating source-separated organics and organics-rich municipal solid waste.

There are two basic methods to compost yard trimmings with food scraps; either through an aerobic "open air" process or an anaerobic process that contains and seals the materials from contact with air. Aerobic composting facilities are designed for collecting, grinding, mixing, piling, and supplying sufficient moisture and air to organic materials (including food scraps and compostable papers) to speed natural decay. The finished product of a composting operation is compost, a soil amendment suitable for incorporating into topsoil and for growing plants. Aerobic compost technologies include: windrows, in-vessel and aerated static piles. The technologies incorporated by the permitted composters in the Austin area utilize the windrow style of composting.

Current Collection Methods

Yard trimmings and brush are currently collected by City crews from various departments and delivered for co-composting with biosolids at Hornsby Bend, operated by the Austin Water Utility Department. Approximately 30,000 tons per year (tpy) of yard trimmings and brush are currently delivered for co-composting at Hornsby Bend. The Department's composting Zero Waste initiative will supply all collection customers with yard trimmings carts and adding food scraps and compostable papers to the current yard trimmings collection program. This could increase the City's program capacity need for collection and processing to an additional approximately 50,000 tpy to over 80,000 tpy over the planning period.

Another Department Zero Waste initiative is to aerobically compost the added food scrap materials through a 2-year pilot program for testing at either Hornsby Bend (if available) or at the FM812 Landfill

facility. In addition to Hornsby Bend, two other private sector composting facilities have been permitted to compost food scraps. According to the facility operators, both facilities have sufficient capacity to meet Austin’s short-term needs and have the capability of expanding their operations for the long-term. Two additional composting facilities are being developed by non-profit and private sector entities. The City will first use existing capacity at Hornsby Bend if they are successful in their pilot composting of these materials and then the other permitted existing composting facilities in the area to meet capacity needs.

It is critical for the Department to work with AWU’s Hornsby Bend staff in the following areas:

- Pilot processing of yard trimmings and food scraps;
- Obtain a permit to accept food scraps and compostable paper;
- Potential full-scale processing of yard trimmings and food scraps; and
- Provide public drop-off for brush.

If foods scraps processing is not feasible at Hornsby Bend, the Solid Waste Services Department will assist in:

- Transition use of commercial brush and clean lumber as a bulking agent rather than residential yard trimmings;
- Use of tree trimmings and other carbon sources from Austin Energy contractors and other City departments; and
- Develop a transition plan for Hornsby Bend to utilize a different bulking agent.

Projected Need for Composting Capacity

Although the Department’s additional need for composting capacity is approximately 50,000 to 80,000 tpy over the planning period, the overall city-wide capacity needs for handling these organics after the recommended initiatives and ordinances are implemented is well above the estimated capacity needs. This is due to the potential amounts of these materials generated by the private sector.

Tons Per Year		Tons Per Day		Projected Facility Needs	
Min	Max	Min	Max	Min	Max
346,000	775,000	1,000	2,000	2	4

City Implementation Tasks for Composting Capacity

Task	Lead Responsibility	Participants	Schedule (FY)
1. Work with Hornsby Bend to conduct pilot program of commingled yard trimmings and food scraps.	Collection Services Division	Hornsby Bend	FY12 -FY14
2. Enter into a service agreement	Collection Services	Hornsby Bend	FY13

City Implementation Tasks for Composting Capacity

Task	Lead Responsibility	Participants	Schedule (FY)
with AW - Hornsby Bend to compost commingled organics collected by City crews.	Division		
3. Encourage the private operators to increase infrastructure to handle the added estimated organic volumes required for collection from new ordinances to meet the City-wide Zero Waste needs.	Strategic Initiatives Division	Collection Services Division	FY14 - ongoing
4. Assess and refine composting collection programs.	Collection Services Division	Strategic Initiatives Division	every 5 years ongoing

10.9 Anaerobic Digestion

Anaerobic digestion is an emerging technology for treating source-separated organics. Anaerobic digestion is a biological process where microorganisms break down biodegradable materials in an oxygen-deficient environment, creating a biogas that can be used to produce electricity or converted into a transportation fuel. This type of biogas consists primarily of methane and carbon dioxide. Although the first phase of the biological process (hydrolysis phase) often operates in batch-type processes, the methane generating and subsequent electrical generation phase of these facilities are designed to operate continuously and provide uninterrupted power. With a proper feedstock, these reactions can reduce the volume of materials by approximately 70 percent and produce a biogas which can be converted into energy or fuel. The residuals or digestate from this process can be utilized in the on-site compost facility for further processing.

Although some emerging technologies, including anaerobic digestion, are currently under consideration or in development with the potential to provide substantial increases in diversion rates, many emerging technologies are not sufficiently advanced to the point of commercial adoption.

As the City achieves its interim 75 percent goal, commercially viable technologies available at that time can be adopted to achieve the 90 percent diversion goal. Evaluation of current emerging technologies supports these anticipated diversion rates. This initiative will be revisited after the City's achievement of its 75% goal and before FY'30 and the goal of 90% diversion.

10.10 Food Waste Disposal Units

Over the past year, City staff have been approached by representatives promoting the use of sink-based food waste disposals as a means to convey food waste through the wastewater system to Austin Water's anaerobic digesters. The City's Sustainability Office, in collaboration with AWU and the Solid Waste Services Department, led research about the potential added use of food waste disposal units and their impacts on city infrastructure.

After careful study of the issue, and providing a balanced perspective that integrates multiple aspects of this issue, specific to Austin's utility and sustainability perspectives, the City recommendation is to maintain its existing position on food waste disposals. This would mean the City does not support the use of food waste disposals in its promotional or educational materials and programs, and would continue its existing ban on commercial disposals. The recommendation rationale relates to the following impact areas.

- Water Quality Impact and Nutrient Loading
- Wastewater Infrastructure Impacts
- Waste Reduction and Solid Waste Infrastructure Impacts
- Water and Energy Conservation Impacts

Commercial Food Waste Disposal Units

In 2007, City Council adopted the recommendations of a Water Conservation Task Force led by Mayor Lee Leffingwell. This task force made multiple recommendations for prohibiting water-inefficient equipment. Those recommendations included a ban on new commercial garbage disposals, which often run water continuously and therefore use much more water than residential garbage disposals. For the City to support the broad use of food waste disposal technology, the plumbing code would need to be modified to lift the ban on commercial disposals; that action would represent a departure from Austin's history of using technical codes to advance water- and energy-conserving technology in new construction.

Many commercial businesses including restaurants have garbage disposals that were grandfathered in after the ban was adopted. These systems can stay in service until there is a need for a remodeling permit. There is no ban on residential disposals. Approximately 80% of residents have disposals, including close to 100% of new home construction. If the City chooses to encourage the use of garbage disposals, various existing City campaigns encouraging commercial and residential customers to limit or avoid the use of their garbage disposal will have to be changed, representing a reversal of current messaging to customers.

Waste Reduction and Solid Waste Infrastructure Impact

Proponents of food waste disposal technologies may claim that point-of-use disposal units represent an easy and attractive solution to help the City reach its Zero Waste goals. However, this claim is not as simple as it may seem. Food waste that is introduced into the City's wastewater system and eventually

land-applied or composted at Hornsby Bend and re-processed into Dillo Dirt is a better alternative compared to sending food waste to the landfill. But, other methods of food scrap management exist which may be more desirable alternatives. In evaluating support for food disposal units, the City should consider the following two factors: 1) the City's future plans for food scrap management; and 2) the City's commitment to the Zero Waste Highest and Best Use Hierarchy, as adopted in the City's Zero Waste Strategic Plan (Strategic Plan).

Future Plans for Food Scrap Management via Curbside Compostable Pickup

With adoption of the Strategic Plan, by resolution, the City Council identified composting as one of four priorities. To achieve Zero Waste goals, the Department plans to expand its education efforts to include separation of organics, such as food scraps, from the waste stream. This education effort will support the Department's goal to eventually implement a 3-cart residential collection system. These carts would be used to collect non-recyclable material to be sent to the landfill (brown cart), recyclable materials (blue cart), and organic materials for composting (green cart).

Promoting disposal of food scraps through a sink-based food waste disposal unit would send mixed signals to the public regarding the actions are intended to assist in achieving sustainability. Several businesses already segregate kitchen food scraps and contract with a commercial service that collects and composts the material. In doing so, they support the creation of green jobs and nurture our local composting infrastructure, both keys to a strong Zero Waste economy. The City and the Department will continue to encourage, recognize, and create incentives to support these green business activities.

Hierarchy of best use

Food scraps contain valuable nutrients that can be re-captured by using compost as a soil amendment. Composting, in the context of a hierarchy of best use, maximizes the value of food waste. Combining residential food scraps with wastewater sludge for subsequent anaerobic digestion and reuse, as recommended by proponents of food disposal units, will diminish the value of the final product. The high-value nutrient composition of food scraps, when put into the City's wastewater system, is intermingled with the variety of contaminants and pathogens normally present in sewage. This degradation reduces the value of the organic material, requires additional processing, and truncates the potential end-use of the resulting material.

The most efficient and sustainable method to deal with food waste would be to compost it on the same site where the waste is generated, and then grow more food at the same location using compost as fertilizer. Unfortunately, many large generators of food waste do not have the land or expertise to grow their own food. The next best option is a centralized system of collection and composting of food waste.

In its effort to achieve Zero Waste, the City plans to implement a comprehensive waste management program for its customers. Additionally, the City is committed to supporting and investing in private sector technologies and services that preserve the value of food scraps, minimize risks to the City's infrastructure, and keep user costs low. In conclusion, the Department continues to support City policy to avoid the use of food waste disposal units.