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Seattle's MSW System:
Managing Discards

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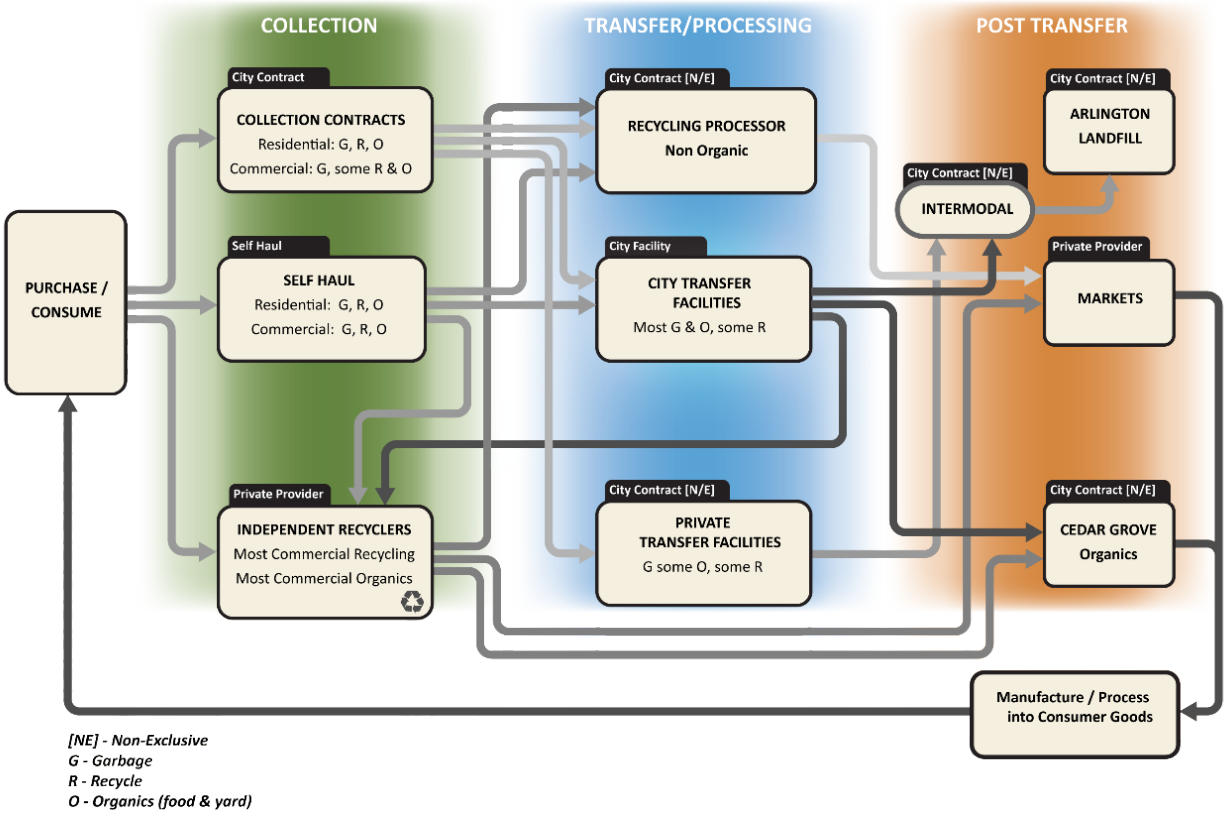
Chapter 4 SEATTLE'S MSW SYSTEM: MANAGING DISCARDS

This chapter describes what Seattle does with the material left over after we've done everything we can to reduce waste generation in the first place. Seattle's Municipal Solid Waste system is the framework for discussing the waste management programs profiled in this chapter.

4.1 WHERE MSW STARTS AND ENDS

Many interrelated parts make up the Seattle Municipal Solid Waste (MSW) system (Figure 4-1). At each stage, SPU makes choices about how to handle the materials. Our programs reflect our decisions.

Figure 4-1
Seattle Municipal Waste System



The first stage in the system is collecting the recycling, organics and garbage discarded by Seattle's homes and businesses. Collected materials are transported to transfer facilities or to processors (recycling and organics). From the transfer facilities, materials go to processors (recycling and organics), or in the case of garbage, to a railhead (intermodal). From the railhead, garbage goes to the landfill on a train. From processors, materials then go to brokers and markets.

A network of public and private service providers and facilities collect, transfer, process, and landfill the city's discards. This Plan includes the facilities shown in Table 4-1 as part of Seattle's MSW system.

Table 4-1
Inventory of City of Seattle Solid Waste Facilities

Operator	Facility/Location	Type
Permitted Facilities in Seattle - City Owned		
SPU	North Recycling and Disposal (Transfer) Station 1350 N 34th St 98106	• Residential garbage and organics collection transfer • Commercial garbage transfer • Self-haul garbage, yard waste and recycling transfer
SPU	South Recycling and Disposal (Transfer) Station 8105 5th Ave S 98134	
SPU	North Household Hazardous Waste Facility 12500 Stone Way N	Moderate risk waste (MRW) facility
SPU	South Household Hazardous Waste Facility 8100 2nd Ave S	MRW facility
Seattle City Light	3613 4th Ave S	MRW facility
Permitted Facilities in Seattle - Privately Owned		
Rabanco Recycling under Republic Services' Allied Waste Services	Recycling Transfer Intermodal 2733 3rd Ave S 98134 (3rd & Lander)	• Recycling processing • Transfer of collected garbage and yardwaste from out of jurisdiction construction & demolition (C&D) transfer • Intermodal C&D transfer and garbage from outside of jurisdiction for long-haul disposal
Waste Management Inc (WMI)	Alaska Reload 70 S Alaska St	Contaminated soil transfer
WMI	Eastmont Transfer Station 7201 W Marginal Way	• C&D transfer • Some commercial garbage transfer • Some commercial recycling transfer • Some residential and commercial organics transfer
WMI	Biomedical Waste Facility 149 SW Kenyon St	Biomedical treatment
Union Pacific Railroad	Argo Rail Yard 402 S Dawson St	Intermodal transfer of C&D and garbage to long-haul disposal
CDL Recycle	Construction Materials Recovery Facility 7201 E Marginal Way	C&D debris recycling
Certain Teed Gypsum	Gypsum products manufacture 5931 E Marginal Way S	Gypsum recycling
LaFarge	Cement plant 5400 W Marginal Way SW	Aggregate and concrete recycling

Operator	Facility/Location	Type
Privately Owned Facilities Outside Seattle Relevant to Seattle System		
Cedar Grove	Composting A)17825 Cedar Grove Rd SE Maple Valley, WA 98038 B)3620 36th Pl NE Everett , WA 98205	Organics composting
WMI	Columbia Ridge Regional Landfill 18177 Cedar Springs Lane Arlington, OR 97812	Landfill disposal
Republic Services	Roosevelt Landfill 500 Roosevelt Grade Road Roosevelt, WA 99356	Landfill disposal

The location of the key City of Seattle facilities is shown on Figure 4-2. We do not list other facilities important to other regional jurisdictions. Also not listed are the dozens of privately operated recycling handlers in the local area. Those private recyclers that handle materials generated from Seattle, however, are required to report annually to the City of Seattle. SPU receives the reports and maintains the data submitted in them.

Figure 4-2
Seattle Soild Waste Facilities

4.2 COLLECTION

In this section, we present recommendations from Seattle's prior solid waste management plan and their progress. We lay out current planning issues, services, and programs and alternatives for program changes. The section concludes with a description of how SPU monitors collection performance.

4.2.1 Collection Recommendations from 1998 Plan and 2004 Amendment

Collection is the stage in Seattle's MSW system where residents and businesses interact the most with materials they discard and the services that collect those discards. It is also the stage where SPU can most influence customer behavior.

Most recommendations from the 1998 Plan and 2004 Update addressed collection (Table 4-2).

Table 4-2
Past Recommendations for Seattle MSW Collection

Recommendation	Status
1998 Plan	
Distribute recycling containers to all single-family residents	Done
Provide recycling collection at least every other week for all single-family residents	Done Now occurs every other week
Eliminate the rigid distinction between single-family and multi-family in recycling collection	Done Multi-family buildings can choose cart or dumpster collection
Implement a vigorous campaign to encourage multi-family building owners to sign up for recycling, and mandate sign-up if goals are not met	Done Signups now >98%
Provide in-unit recycling containers or other incentives to multi-family tenants	Blue bags implemented 2002 Phased out 2004
Evaluating benefits of requiring space for garbage and recycling containers in new commercial and multi-family construction and remodeling would ensure that space barrier is not a future issue	Done
Add voluntary food waste collection for single-family residents	Done
Promote commercial food waste separation	Several collection options (including one municipal option)
Provide recycling collection to small businesses	Done
Provide more opportunities for recycling at Home Clean-up drop sites	Home Clean-up program dropped
Customers will not be allowed to set yard waste at curb in plastic bags	Done
Same-day collection of all materials from single-family residences	Done
In final decision on collection frequencies for single-family yard waste and recycling, and sorting recyclables, city will balance customer service, cost, and environmental concerns	Done Organics and garbage weekly Recycling every other week
City will work with Health Department to evaluate and test feasibility of collecting garbage every other week	Pilot done in Renton

Recommendation	Status
2004 Amendment	
Increase the efficiency, fairness, convenience, and accessibility of services	Done
Manage current contracts to provide service efficiency and high-quality customer service	Done New contracts have more financial incentives for good performance
Evaluate current policies and service delivery strategies	Done
Partially integrate commercial and residential services to create more efficient collection routes	Done Commercial and residential served by same contractors/trucks within service area
Provide yard debris containers to single-family residents	Done
Increase yard debris pickups to every other week year-round	Now every week
Commercial food scraps collection service.	Done
Curbside recycling service expanded to all businesses (up to two 90-gallon carts every other week)	Done

4.2.2 Collection Planning Issues

Several issues must be considered in MSW collection planning.

Legal Requirements

In Seattle, SPU is responsible for managing the solid waste system. The Seattle Municipal Code establishes the following requirements:

- Hauling residential garbage, recycling, and organics; commercial garbage; and construction & demolition (C&D) waste in Seattle is limited to designated contractors. Generators may self-haul these materials. (Multi-family residential units may use either City of Seattle or private contractors for recycling and organics.)
- All non-recycled garbage in Seattle must ultimately go to the city's contracted landfill.
- All non-recycled C&D waste in Seattle must ultimately go to designated facilities.
- All residential (single- and multi-family) customers must subscribe to garbage collection service. All single-family residential customers must subscribe to organics collection service unless they compost vegetative food scraps in their own yard. All multi- family customers must subscribe to organics collection service beginning September 2011.
- Yard waste, paper, cardboard, and hazardous waste are banned from the garbage in all MSW sectors. Bottles and cans are also banned from the garbage in the residential sectors.

The 60% Recycling Goal

Much of Seattle's recycling success comes from providing convenient separation bins and reliable collection service. While Seattle's recycling rate continues to climb and is now at an all-time high, much more must be done to reach Seattle's 60% goal. See section 4.3 for an overall discussion of recycling.

Collection (Generation) Growth

The effect of the recent recession is evident in the 15% drop in total generation between 2007 and 2009. The 2007 level of waste generation is not expected to be reached again until 2026. The SPU collection infrastructure is quite likely to be adequate for the next couple of decades.

Cost Effectiveness

Cost effectiveness is one of the factors SPU looks at when deciding changes to collection programs.

Affordability

SPU will continue to examine ways to reduce both overall cost of the MSW system and provide options to help customers keep their collection bill low through reducing, recycling, and composting.

Contamination Rates

Recent waste sorts have revealed a small growth in the contamination rate (amount of garbage put in with recycling). Some of this increase may be from co-mingling glass with other recyclables. Some may be from customer confusion over the increased number of materials now recycled. SPU will continue to monitor contamination through regular waste sorts and will develop corrective actions if the trend becomes a problem.

Collection Practices and Environmental Protection

Collection protects the environment by supporting recycling. Beyond the benefits of recycling, SPU looks for the following specific opportunities to protect the environment:

- Continuing to find opportunities to reduce green house gas emissions from collection operations. Examples include optimizing route efficiency, and the clean truck fuel requirements in the collection contracts that started in 2009.
- Collecting used motor oil keeps this material from entering the city's drainage system. Similar programs for other materials may also benefit this part of our environment.
- Collecting used consumer electronics puts metals and other materials into the recycling stream.

Shifts in Customer Base over Time

Seattle will shift away from manufacturing enterprises toward more service and office-type businesses. See Chapter 2, Seattle Solid Waste Trends, Table 2-2.

Shifts in Consumption over Time

As consumption patterns change, so does the composition of discards. As new products and materials are continuously introduced, SPU must analyze them frequently enough to identify and readily respond to change.

Equity in Service

SPU will continue to emphasize monitoring all neighborhoods in Seattle for a consistent high level of service, regardless of ethnic or racial composition.

Infrastructure Disruptions

The Alaskan Way Viaduct and North Transfer Station rebuilds will temporarily reroute collection trucks. The new 2009 collection contracts anticipated these events and contain provisions for handling them. See section 4.4, Transfer Facilities, for more detail.

Customer Service

SPU will continue to examine and implement ways to improve collection service and the responsiveness of our Call Center.

4.2.3 Current Collection Programs and Practices

Two city-contracted companies, Waste Management and Cleanscapes, collect residential and commercial garbage, recycling, and organics. Current contracts started in March 2009 and will run at least until 2017 (Figure 4-3).

SPU designs collection services according to goals for, and needs of each sector. Service areas and routes are planned for efficient use of collection vehicles. It is also important to even out the amount of material collected each day. Transfer and processing facilities need an even, predictable inflow to avoid having to stockpile incoming materials.

The self-haul sector may also be considered a means of collection as residents and businesses gather and transport their discards.

In the residential sector, which includes both single- and multi-family units, garbage, recycling, and organics are collected by either Waste Management or Cleanscapes. All residences in Seattle must subscribe to garbage collection service.

The contractors take residential garbage to one of two city-owned transfer stations. Occasionally, residential garbage is taken to private transfer facilities, such as when a city station needs to close temporarily due to a major equipment failure.

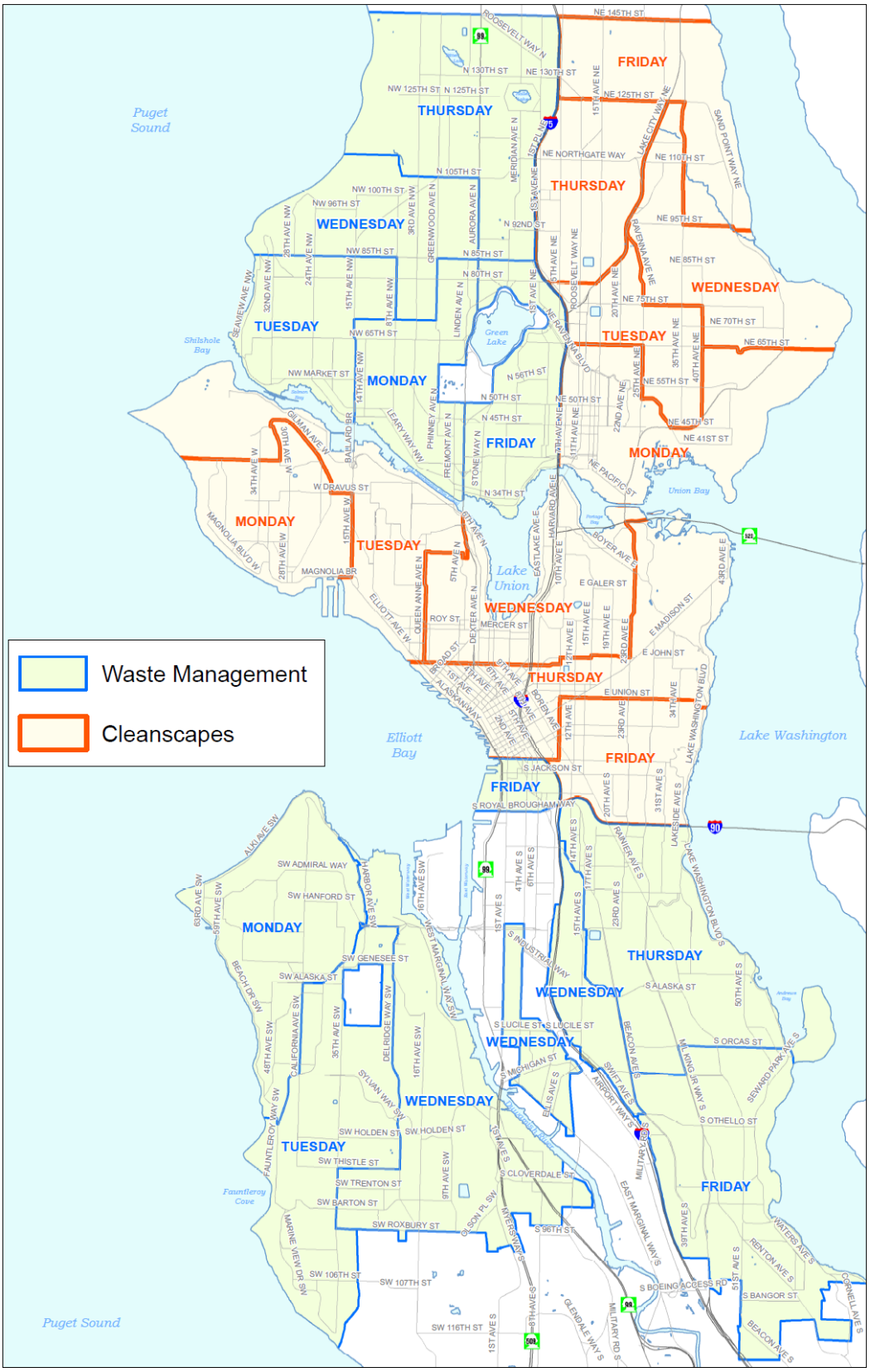
Residential organics (combined yard/garden trimmings, all food scraps, and food-contaminated paper) are also picked up then transferred at Seattle's two transfer stations. Yard waste is legally prohibited from garbage.

Residential recyclables are picked up and deposited at a sorting plant (processor). SPU maintains a list of accepted materials.

Single-Family Residential Collection Service Levels

Single-family residences must sign up for garbage collection service. Garbage is collected weekly. All materials are collected on the same day to avoid customer confusion. Residents may choose from several sizes of garbage cans or carts. Price goes up with the size of can to encourage recycling. Customers set the cans out at the curb or alley on their collection day. Backyard service is available for a fee or free for qualified (usually for disability reasons) customers. Extra garbage, properly contained, may be set out for a fee.

Figure 4-3
MSW Collection Service Areas by Vendor



For single-family customers, recycling is collected every other week. Customers automatically sign up for recycling when they request garbage collection. The garbage fee includes recycling service. Customers place their recycling in either a 64- or 96-gallon wheeled cart, which they put out at the curb or alley on the collection day for garbage.

In 2009, Seattle's recycling collection went single stream. *Single stream* means all recyclables go into one bin. Extra recycling, properly contained, may be set out free.

Organics are collected weekly. Currently, all single-family customers must subscribe to organics collection service, unless they compost their food waste in their back yard. Customers may choose from three sizes of wheeled carts. (Price goes up with size to encourage onsite backyard composting.) Customers put their organics carts at the curb or alley on the same collection day as garbage. Extra organics, properly contained, may be set out for a fee.

Single-family customers also have other materials they may set out for collection: used motor oil (properly contained), bulky items (extra fee), and electronics (extra fee).

Single-family customers may also request a dumpster for times when they have extra large volumes of material.

Multi-Family Residential Collection Service Levels

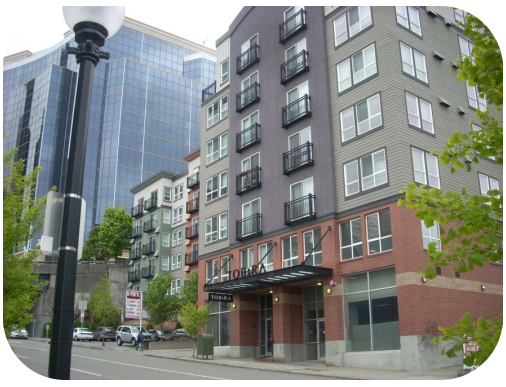
SPU's collection contractors pick up garbage from multi-family buildings at least once a week. Various sizes of dumpsters, and some wheeled carts, are available to customers in this sector. Collection frequency and dumpster size depend on the needs and space constraints of the building, and determine the monthly fee. Price goes up with container size and frequency to encourage recycling. Multi-family buildings are required to subscribe to garbage service.

Recycling service is available at no charge to multi-family buildings. Each property is assessed for type and size of containers and collection frequency. Depending on a property's needs, it may have a combination of recycling carts and dumpsters. Most apartment buildings and condominiums have recycling collected every other week.

About 96% of multi-family buildings are registered for recycling service. Seattle law bans placing recyclables in residential garbage. However, multi-family buildings are not required to sign up for recycling. Buildings that have recycling can usually reduce garbage service and lower costs.

Organics service was optional in this sector until September 2011, when it became a requirement. Again, building needs determine container size and collection frequency.

The following additional services are also available: used motor oil recycling, bulky item pickup, and electronics recycling. Residents must arrange these services with building management.



Commercial Collection Service Levels

In the commercial sector, garbage is handled much as it is in the residential sector. Garbage from dumpsters of various sizes is collected weekly or more frequently by city contractors and transferred at the two Seattle transfer stations. The monthly fee depends on container size and how often it is picked up. Price goes up with container size and collection frequency, to encourage recycling. Commercial businesses do not have to subscribe to garbage collection service. They can self-haul to a city or private transfer station.

Recycling collection in the commercial sector is much more diverse. A small part of this stream uses the cart-based, city-contracted, biweekly residential curbside recycling system. Seattle offers this service at no additional charge. However, a wide variety of haulers collects most recyclables in the commercial sector. They collect various materials in various states of sorting from a wide variety of dumpster sizes, including some onsite compactors. Collectors sometimes take materials to full-scale sorting facilities and sometimes to specific brokers. City law bans the disposal of paper and cardboard in the garbage. Starting 2012, a new City of Seattle law bans disposal of asphalt, brick, and concrete in commercial garbage.

Commercial customers with organics have several options for collecting these voluntarily separated materials. They may use one of two city-contracted collection services or a private collection service. Typically, the collected organics go straight to the compost facility instead of to a transfer facility. Or, when customers subscribe to the city-contract cart-based organics (residential-type) service, the materials go to a city transfer facility before going to the processor.

Self-Haul Collection Service Levels

Businesses may haul their garbage, organics (yard and food waste), and recyclables to either of the two city-owned transfer stations. See section 4.4, Transfer Facilities, for more detail on accepted materials. Businesses may also take garbage and yard waste to private transfer stations. Private stations require that they be contacted for accepted vehicles and materials. Recyclables may also be taken to various recycling processors.

When residential customers have quantities of materials or materials unsuitable for curb service, they also may bring the materials to city-owned recycling and disposal stations. However, SPU encourages these customers to use regular and special curb services instead, whenever possible to keep station traffic to a minimum. Curb services are often cheaper for the customer. Smaller vehicles used by residents usually require hand unloading. Most private facilities do not do allow unloading by hand.

Outreach and Education for Collection

SPU's integrated solid waste outreach and education programs are described in Chapter 6, Administration and Financing, section 6.2. SPU has achieved high customer understanding of and awareness for:

- How to sign up for and change service (customer service functions)
- When to set out materials (collection calendars)
- What to put in each can or bin (color-coded cans, stickers with pictures, what-do-I-do-with online, etc.)

4.2.4 Collection Alternatives and Recommendations

Recommendations for collection fall into two categories: recycling and collection system.

Collection Recycling Recommendations

The major focuses of collection recycling recommendations include:

- Enhancing recycling education approaches
- Increasing awareness of customer options for additional recycling set-outs, including unlimited free extras, and larger cart or additional carts on request
- Expanding contamination outreach and enforcement, especially for non-compostable materials in organics collection
- Increasing enforcement of current disposal bans
- Banning certain additional materials from disposal in the garbage
- Considering changing single-family garbage collection from weekly collection to every other week.
- Composting pet waste and diapers

See section 4.3, Recycling, for detailed recycling recommendations, including those for collection.

Collection System Recommendations

Recommendations for the collection stage of SPU's MSW system structure center on the strong foundation of current practices.

Continue Current Practice of Contracting Out

Bidding out sections of Seattle for collection services achieves the best price for SPU ratepayers by encouraging competition. Current contracts started in 2009. The contract with Cleanscapes is set through at least 2017. The city has opt-out options in 2017, 2019, and 2021. The contract with Waste Management is set through 2019 with city out-out options in 2019 and 2021.

Continue Monitoring Collection Performance

SPU closely monitors collection contractor performance for reliable collection, timely container delivery, satisfaction, and equity of service. Monitoring performance is critical for ensuring contractors meet their obligations and customers receive the service SPU promises. Details about performance monitoring follow.

4.2.5 Monitoring and Performance Measurement

SPU expects to continue current performance measures, addressing reliable collection, timely container delivery, customer satisfaction, and service equity.

Reliable Collection

SPU tracks the following missed collection categories to measure collection reliability collection: initial misses, repeat misses, and collection of misses. The service target for missed pickups is one miss per 1000 scheduled pickups (target = 1/1000 collection). At the highest level, SPU tracks misses whether the customer is:

- **Curbside —** Cart customers, who are mostly single-family residential
- **Dumpster —** Dumpster customers, who are most of Seattle's multi-family customers and commercial businesses

Misses are tracked this way because truck-type and routes differ for each. If needed for trouble shooting, more detailed miss data are gathered and maintained, including address and collector.

Figures 4-4 and 4-5 show curbside and dumpster misses for the year before the new collection contracts, the transition to the new collection contracts begun March 31, 2009, and a full year post implementation.

Figure 4-4
Curbside Misses per 1000 Stops

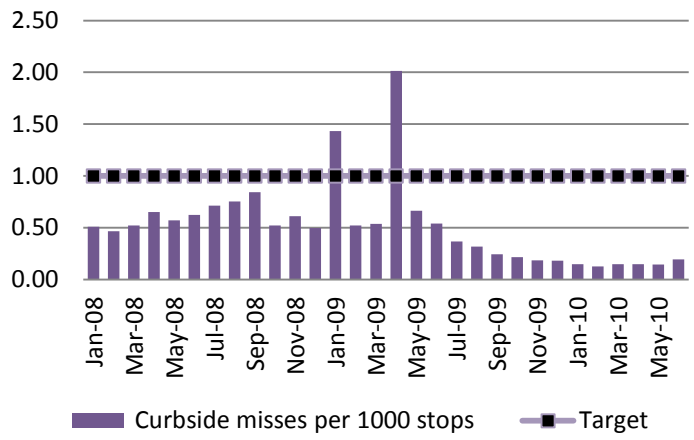
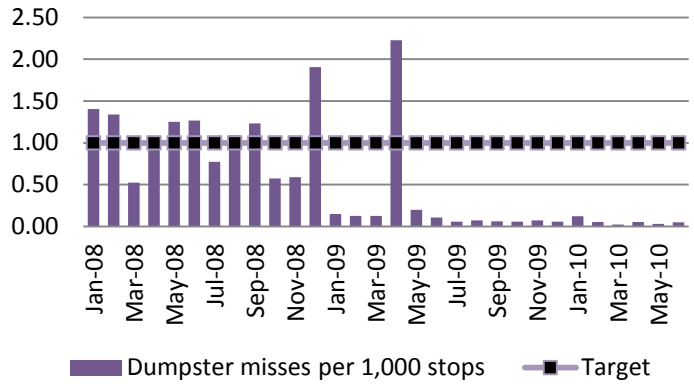
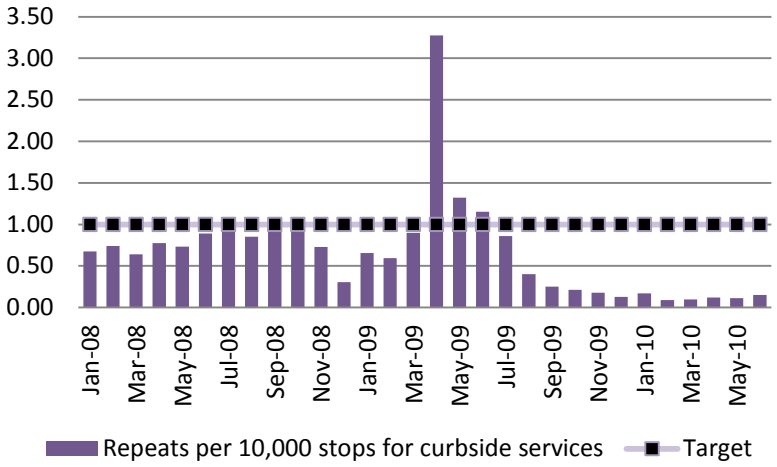


Figure 4-5
Dumpster Misses per 1000 Stops



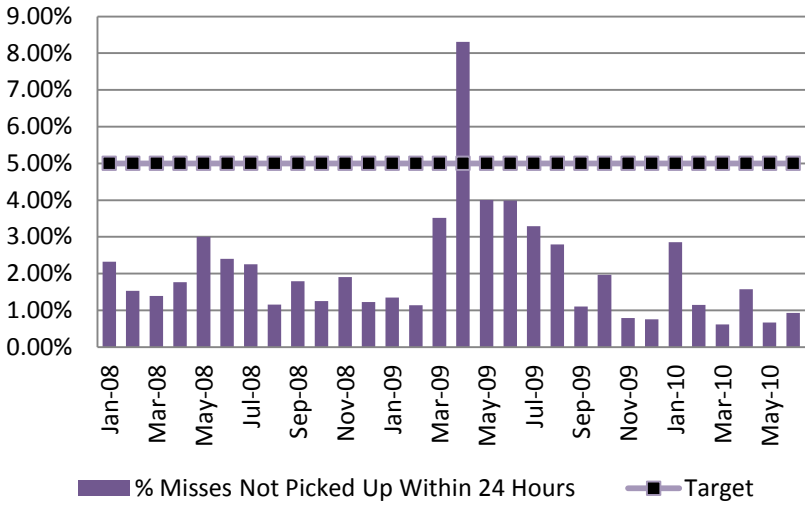
SPU also tracks repeat misses (how many times a missed customer is missed again). The service target for repeats is one miss per 10,000 scheduled pickups (target = 1/10,000 collection). Figure 4-6 shows repeat misses before, during and a full year after the transition to new collection contracts starting March 31, 2009.

Figure 4-6
Repeats per10,000 Stops for Curbside Services



The third aspect of missed collection that SPU tracks is whether a miss is promptly picked up after reported. The target is to pick up 95% missed collection within 24 hours (target = 95%). Figure 4-7 tracks miss collecting over the periods before, during, and after transition to new collection contracts.

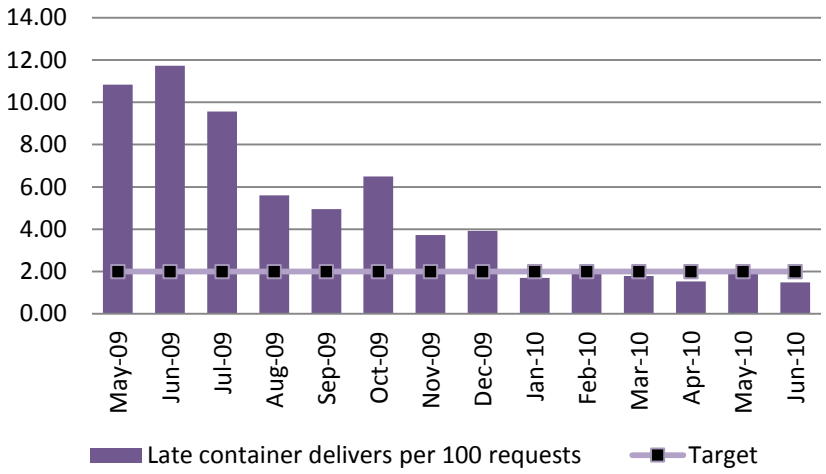
Figure 4-7
Percent Misses not Picked Up within 24 Hours



Timely Container Delivery

Customers sometimes need a replacement container or different containers due to service changes. When SPU implemented new collection contracts March 31, 2009, it needed many container changes. Timely delivery emerged as a new performance issue to track. The target is to deliver 98% of containers within 5 business days (target = 98%). Late container deliveries have dropped since SPU started tracking this measure a year after transition (Figure 4-8).

Figure 4-8
Late Container Deliveries per 100 Requests



Overall Customer Satisfaction

SPU surveys its residential customers every even-numbered year (Table 4-3). One question asked is the overall satisfaction level for garbage, recycling, and organics collection. SPU's goal is to score no lower than a "5" on a 1 to 7 scale. Similarly, we survey commercial customers with the same questions every other odd-numbered year. During the recession, SPU suspended the customer survey.

Table 4-3
Customer Satisfaction

	Satisfaction Level[†]
Residential - 2011 Survey	
Garbage Pick-up	6.00
Recycling Services	5.98
Yard and Food Waste Pick-up	6.09
Commercial - 2011 Survey	
Garbage Pick-up	5.67
Recycling Services*	5.69
Yard and Food Waste Pick-up	5.45

[†] Scale = 1 (not satisfied) to 7 (very satisfied)
*Mix of city-contractor and private service

Equity of Service

Several years ago, SPU did a statistical study to determine if there was any relationship between missed single-family solid waste collection and percentage of people of color in a neighborhood. Using in-house service data and 2000 Census data, we determined that there was a statistically significant relationship. The higher the percentage of people of color, the higher the collection miss rate. Further investigation showed that three factors drive this relationship:

- Overall density of customers per unit of area
- Frequency of special back yard services (as opposed to curbside services)
- Ratio of multi- to single-family dwellings

Each factor was positively correlated with collection miss rate. When the analysis was controlled for these factors, the correlation of collection misses and percentage of people of color in a neighborhood disappeared.

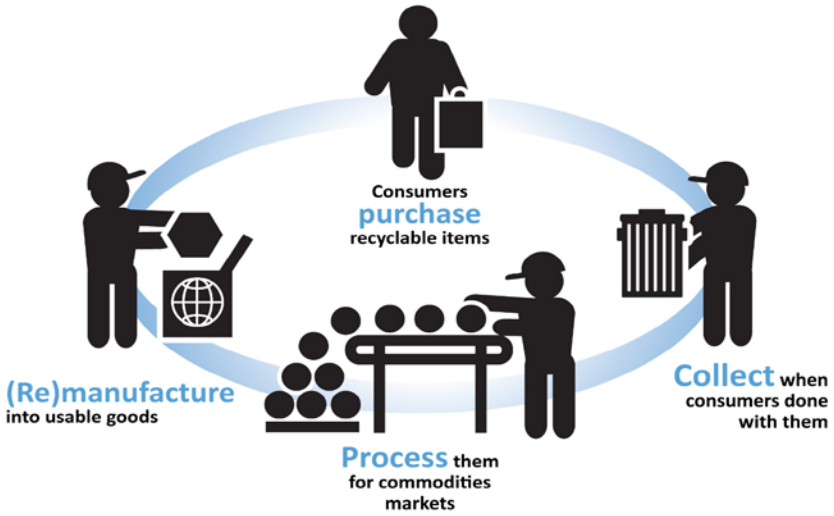
SPU highlighted these results with our new contractors before our new 2009 contracts began. We also introduced a more comprehensive set of performance incentives in the 2009 contracts. Under the new contracts, overall performance has increased. And there is no apparent statistically significant relationship between percentage of people of color in a neighborhood and collection miss rate.

4.3 RECYCLING

After waste prevention and reuse, the next best option for dealing with discards is to recycle them. Recycling isn't a program in itself. It is a strategy carried out in education, waste prevention, market development, collection, processing and other programs. See Chapter 2, Seattle Solid Waste Trends, for recycling achievement history.

The environmental benefits of recycling are well known:

- Less pollution to land, water, air (less greenhouse gas emissions)
- Less demand for virgin resources
- Habitat conservation
- Energy savings



Recycling Turns Used Products into New

The biggest savings from recycling are the avoided environmental costs of producing new products, particularly from lower energy use. Recycling conserves resources by keeping them in circulation. It reduces depletion of non-renewable resources such as fossil fuels and mineral ores used to manufacture products from virgin materials. Composting organic materials, like yard and food wastes, recycles them to the soil. It imitates natural processes of decay and regeneration.

Recycling can also save money if there are markets for the collected materials. Seattle's recycling collection has saved millions of dollars for ratepayers over the last 20 years.

Recycling's ability to reduce greenhouse gas emissions is increasingly a focus of climate protection. For example, the emissions reduction potential of diverting 1 year's worth of food scraps from landfills through composting is equal to about 1.8% of Washington's 2050 greenhouse gas emissions reduction goal.

But, recycling is not a cure-all. It has an environmental impact. Collection, sorting, transportation, and re-manufacture of recyclables all use non-renewable resources that can contribute to pollution. There is always some loss, some waste, as the material goes round the cycle. A piece of office paper, for instance, can only be recycled a limited number of times before its fibers lack the strength to undergo the process any more.

4.3.1 Recycling Recommendations from1998 Plan and 2004 Amendment

The previous plan and its amendment recommended several recycling options (Table 4-4).

Table 4-4
Past Recommendations for Seattle Solid Waste Recycling

Recommendation	Status
1998 Plan	
Recycle 60% of waste generated in Seattle by 2008	2009 recycling rate = 51.1%, about 10 percentage points above 2004 level. Goals still 60%, reset to achieve by 2012 by Resolution 30990
Expand local markets and increase purchases of recycled content products	Markets continue strong. City Purchasing promotes recycled content
Provide technical assistance and recycled product performance testing	Dropped
Propose mandates or bans if sector goals are not being achieved	Variety of bans on disposal of recyclables implemented for residential, commercial and self-haul sectors since the1989 ban on yard waste in garbage
Increase employee recycling education and participation in internal city recycling programs	Ongoing
Broaden the buy-recycled program to incorporate a wider range of environmentally responsible practices	Ongoing
2004 Amendment	
Target recyclable materials that are being landfilled in large quantities	Ongoing
Expand local markets and increase purchases of recycled content products	Markets continue strong. City Purchasing promotes recycled content. Leadership role in this area
Implement new recycling programs to meet the 60% goal	New programs implemented
Commercial paper and cardboard disposal ban	Implemented 2005
Commercial yard debris disposal ban	Implemented 2005
Residential disposal ban on paper, cardboard, bottles, and cans (that is, current recyclables)	Implemented 2005

4.3.2 Recycling Planning Issues

This section describes issues that influence recycling planning in Seattle.

The *Zero Waste Resolution* New Recycling Directives

The 2007 City Council *Zero Waste Resolution* (Resolution 30990) outlined key additions to SPU's solid waste work plan. Many of the actions are accomplished or well underway. Funding constraints inhibited progress on others. See Appendix B, *Zero Waste Resolution (Resolution 30990)*.

Measuring Recycling

Waste prevention can complicate measuring recycling. Successful waste prevention, the first strategy toward zero waste, reduces all discards, including recycling. For example, cutting back on phone book deliveries reduces paper use, but it also reduces the amount of paper that can be recycled and counted toward the recycling goal. The difficulty of measuring waste prevention (tons never created and tons that don't enter the MSW system) compounds the problem. When supportable metrics are available, SPU calculates tons prevented and "credits" them toward the recycling rate.

Regular Waste Sorts

Regular waste sorts are critical for program planning (Table 4-5). The recycling rate is only one facet of knowing how we're doing. SPU also needs to know what our programs are not diverting, and we do that through regular studies of waste stream composition. Knowing what's being disposed of in the garbage and who put it there is critical planning information. Waste sorts are now on a (roughly) 4-year cycle. See the SPU website.

Table 4-5
Recent and Planned Waste Composition Studies (2000 – 2018)

Sector	Year									
Residential		2002		2006			2010		2014	2018
Commercial & Self-Haul	2000		2004			2008		2012	2016	
C&D Debris at Private Stations					2007			2012-13		

The C&D facility certification we are proposing will include regular assessments of disposed materials. See Chapter 5, Other Seattle Solid Waste Programs, section 5.1 for more detail on C&D debris.

Programming Needs for Recyclables

Each sector differs in what remains to be recycled from the garbage.

Single-Family Sector

Seattle's single-family sector recycling rate reached 70.3% in 2010. Analysis of 2009 recycling results showed that about 51% of the disposed materials could have been recycled under current programs (Table 4-6).

Table 4-6
Single-Family Potentially Recyclable Materials

Recyclable Material	2009 Disposed Tons	Recovery Rate
Organics - Food & Compostable Paper	24,000	50%
Organics - Yard Waste	1,000	98%
Recyclable Paper	5,000	88%
Other "Curb" Recyclables	4,000	81%

The biggest gains would come from targeting food scraps and compostable paper. Beginning in 2005, customers could put all foods (except meat and dairy) and compostable paper in the organics bin. In 2009, SPU allowed meat and dairy, with the

switch to weekly organics collection and mandatory sign-up for organics bins. The 2009 changes—known as the *universal service requirement*—are already yielding increased diversion and should continue to ramp up over the next few years. SPU plans continued outreach and education as customers get used to putting compostables in an organics bin.

Pet waste and diapers comprised a notable 17,000 tons (25% of disposed tons 2009) of single-family disposed waste. Currently, no diversion options exist beyond private reusable cloth diaper service.

The following factors make programming unique to the single-family sector:

- Direct link between a consumer's purchasing and disposal practices and costs
- Ability to communicate directly to persons responsible for a home's waste behaviors
- Largest sector (152,309 accounts in 2009). Requires a lot of tactical planning for significant program changes
- Homogenous service design (the same set of service options) works for most.

Multi-Family Sector

The multi-family sector recycling rate hovered between 28.3% and 27.0% in 2007 through 2009. It then rose to its highest ever rate 29.6% in 2010. Analysis of 2009 recycling results showed that about 58% of disposed materials could have been recycled under current programs (Table 4-7).

Table 4-7
Multi-Family Potentially Recyclable Materials

Recyclable Material	2009 Disposed Tons	Recovery Rate
Organics - Food & Compostable Paper	19,000	1%
Organics - Yard Waste	1,000	44%
Recyclable Paper	6,000	68%
Other "Curb" Recyclables	4,000	57%

Food and compostable paper are the prime targets in the multi-family sector. The sector considerably lags the single-family's diversion rate for other recyclables banned from disposal. In third quarter 2011, all multi-family buildings are required to sign up for organics service. Organics diversion should ramp up in the future.

Pet waste and disposable diapers comprised 6,000 tons in 2009, or about 12%, of this sector's disposed waste.

The following factors make programming to the multi-family sector unique:

- Building operators, not tenants, subscribe for service, losing the economic incentive to recycle or compost instead of disposing in the garbage.
- It takes extra effort for SPU to communicate directly with tenants because building operators are the subscribing customer. Tenant populations move more often and have a larger proportion of people who do not speak English.

- In 2009, SPU had 5,383 multi-family dumpster accounts serving over 100,000 households.
- The physical layouts of buildings all differ, with differing abilities to store and service collection containers.

Self-Haul Sector

Self-haul recycling has consistently hovered in the 17 to 19% range over the last 10 years, dropping to 13.5% in 2010 (Table 4-8). About 40% of self-hauled material was potentially recyclable, based on 2009 recycling analysis.

Table 4-8
Self-Haul Potentially Recyclable Materials

Recyclable Material	2009 Disposed Tons	Recovery Rate
Organics - Food & Compostable Paper	2,000	0%
Organics - Yard Waste	1,000	90%
Recyclable Paper	4,000	27%
Other Recyclables	3,000	64%
Potentially Recyclable - C&D Debris	23,000	1%

SPU expects some improvement in recovering presently recyclable materials with the rebuilding of the transfer stations. However, significant improvements depend on creating a post-consumer sorting function for construction debris and clean wood, which makes up more than 60% of this sector's disposed waste stream.

The following factors make programming to the self-haul sector unique:

- Commercial businesses and large institutions (for example, Seattle Housing Authority, University of Washington) bring the bulk of material self hauled to the transfer stations. If they have pure loads of recyclables, they can usually take them directly to processors. That recycling is credited to the residential or commercial sector, not self-haul.
- The self-haul stream includes several large, unique customers. Such customers require targeted assessment and education to discover their potential to increase recycling. As noted, increased recycling will shift the recycling "credit" to the commercial or residential sector. However, this nuance of measurement doesn't affect program planning. Another way to gauge progress in this sector would be a decline in the amount of recyclables in garbage as assessed by periodic waste sorts.
- Seattle does not require businesses to subscribe to garbage service. For self-haul, it wouldn't always make sense. These businesses often have waste as a by-product of their enterprise on others' property (for example, landscapers, roofers and remodelers). SPU provides all services to these customers at the transfer stations. By comparison, other self-haulers have collection service at their home or business.
- Others self haul because they have more material than will fit into the service they have at their home or business. Lack of awareness of existing services for

"extras" and bulky items causes unneeded trips to the stations and extra customer costs.

- Home remodelers and small contractors often find it more convenient to use the city transfer stations rather than private transfer stations for loads containing construction waste. This is the case even though the tip fee for garbage at Seattle transfer stations is much higher than at private stations. The private transfer stations also are not set up for handling many small vehicle loads and often require a credit card for payment. Programs to increase recycling from this group of customers would need to occur at the city-owned stations.
- Communication challenges in this sector are as diverse as the customer base. Customers range from home-owners, multi-family dwellers, small-to-large businesses, and large institutions. Outreach must be tailored to each.

Commercial Sector

Commercial sector recycling reached 58.9% in 2010. (Table 4-9). About 70% was potentially recyclable, based on 2009 recycling analysis. This is the largest sector. A percentage gain in the commercial sector carries the most impact in reaching Seattle's recycling goal.

Table 4-9
Potentially Recyclable Material Disposed 2009 in Commercial Sector

Material	Tons	Diversion Rate
Organics - Food & Compostable Paper	64,000	51%
Recyclable Paper	23,000	79%
Other Recyclables	11,000	47%
Plastic Film	8,000	5%

The largest remaining targets include food and compostable paper, recyclable paper and cardboard, traditional recyclables, and plastics. Paper and cardboard are already banned from disposal. Seattle is currently developing a targeted program for plastic film. The program could be as simple as connecting businesses that have large volumes of discarded film with recyclers who want it.

The commercial sector is as diverse as the businesses operating in Seattle. It presents its own set of programming challenges:

- The link between who pays and who puts materials in the garbage or recycling can be very direct. Or the link is remote (as in the case of large businesses with many employees). And garbage bills tend to be small compared to other business costs.
- Since most businesses subscribe to garbage service, and they must use city-contract collectors when they do, SPU knows where to reach them for education outreach. In 2009, the commercial sector had 8,351 accounts.
- The types of waste generated and physical characteristics of businesses are widely varied. There is a corresponding variability in their ability to respond to

new requirements. Providing technical assistance is highly valuable to making gains in this sector.

- Enforcing disposal bans takes more effort because it's hard to see into large dumpsters and compactors.

Event Recycling

Event recycling is the responsibility of those holding the event. State law requires recycling at large events ("official gathering" RCW 70.93.093). The law specifically addresses beverage container recycling. Vendors may manage the recycling themselves or pay to have it done.

Seattle has gone a step further by requiring recyclable or compostable packaging for all quick-serve food as of 2010. Compliance has ramped up. Compost bins are now provided at many public events. See Chapter 3, Waste Prevention, for more detail.

In addition to boosting recycling, both provisions help reduce litter. See Chapter 5, Other Seattle Solid Waste Programs, section 5.3 for more detail on public place litter management.

City of Seattle Recycling

While the City of Seattle is responsible for planning and managing Seattle's solid waste, it is also a major generator and should be a leader in waste reduction and recycling. The city pays to manage its garbage and recycling just like other businesses and institutions.

All city offices have had convenient recycling containers for many years and recently brought in food waste composting. See Chapter 3, Waste Prevention, for detail.

4.3.3 Current Recycling Programs and Practices

Currently operating recycling programs and practices are described in the following sections of the Plan:

- Chapter 3, Waste Prevention
- Section 4.2 Collection
- Section 4.4 Transfer Facilities
- Section 4.5 Processing and Disposal
- Chapter 5, Other Seattle Solid Waste Programs, section 5.3, Clean City Programs
- Chapter 6, Administration and Financing, section 6.2, Education Programs

4.3.4 Recycling Alternatives and Recommendations

This section describes the development of recycling program alternatives. Recommendations are based on analysis of the alternatives.

Recycling Programs Analysis

SPU has developed several potential new recycling programs through a step-wise approach. Staff analyzed which currently recyclable materials are still being disposed of by the different

sectors and program directives from the *Zero Waste Resolution*. We then prepared program factors to feed SPU's Recycling Potential Assessment (RPA) model including:

- Descriptions of how programs would work including targeted sectors and materials
- Cost to implement
- Estimated participation and efficiency

Recycling Potential Assessment (RPA) Model

The RPA model forecasts potential increased recycling from packages of programs (scenarios). The model starts with an econometric forecast of waste generation based on demographic and economic forecasts. It uses data from the waste composition studies about what is left in the waste stream. The model can calculate new recycling diversion based on assumptions about how effective each program could be for each targeted material.

RPA results include forecasted recycling rates for the planning period, as well as the costs and avoided costs of each program and scenario. The planning period used in the RPA is 2010 through 2030.

The RPA model includes a cost module that calculates new or incremental costs associated with implementing and running each program. Examples of costs are new staff, customer education, and equipment and contractor payments. In addition, the model calculates the savings from each of the programs when the new tons recycled do not have to be collected, transferred and disposed. This is called the *avoided cost*, or the financial benefit, to recycling.

SPU conducted more economic analysis on the environmental benefits associated with recycling. Those results show the net annual value of the environmental benefits to be millions of dollars above and beyond direct financial impacts. The analysis is explained in Appendix D, Recycling Potential Assessment Model.

Status Quo Programs

The first scenario analyzed by the RPA was the base-case (status quo) set of programs (Table 4-10). Status quo includes long-standing programs and three recent programs.

Table 4-10
Status Quo Scenario Recycling Programs

Program	Description
Long-Standing	
Residential Recycling Collection	Recycling collection from single- and multi-family residences
Residential Organics Collection	Yard waste and food waste collection from single- and multi-family residences
Grasscycling	Grass clippings returned to the lawn by the use of mulching mowers
Backyard Organics Composting	Backyard composting of yard and food waste at single-family residences
Self-Haul Yard Waste	Yard waste self hauled and dropped at city transfer stations as "clean green"
Self-Haul Recycling Drop Off	Recycling self hauled and dropped in recycling bins at city transfer stations
Commercial Recycling	Recycling and organics collected from commercial businesses by city-contracted and private haulers
Recently Begun or Established	
Recyclable or Compostable Food Container	All quick-serve food packaging required to be recyclable or compostable (or reusable), starting mid-2010, and recycling and compost containers must be provided
Multi-family Universal Organics Service	All multi-family buildings required to provide organics service to tenants, starting late 2011
Asphalt Paving, Concrete, Bricks Banned from Disposal	Asphalt paving, concrete and bricks are banned from disposal in the garbage (must be recycled) implementation starts 2012

Even with the addition of the three newest programs, the RPA modeling of the status quo programs showed that Seattle would not reach the existing recycling goals of 60% by 2012 and 70% by 2025 (Table 4-11).

Table 4-11
Status Quo Scenario Recycling Rate Projections

Year	Single-Family	Multi-Family	Self-Haul	Commercial	Overall
2009 Actual	68.7%	27.0%	16.7%	54.9%	51.1%
2010 Actual	70.3%	29.6%	13.5%	58.9%	53.7%
2012	70.2%	30.4%	17.6%	56.3%	52.1%
2015	71.5%	38.2%	19.5%	58.2%	54.0%
2020	71.7%	41.2%	19.6%	58.4%	54.1%
2025	71.7%	41.3%	19.6%	58.4%	53.9%
2030	71.7%	41.3%	19.6%	58.4%	53.9%

New Programs

SPU used the RPA to model several programs for inclusion in its recycling programs (Table 4-12). Most of these programs would affect SPU's current collection programs.

The RPA modeled new bans on MSW—the targeted materials would no longer be allowed in residential, self-haul or commercial garbage. Chapter 5 presents the proposed material bans for construction waste disposal.

Table 4-12
Modeled New Programs

RPA #	Program	Description	Target Sectors*	Target Materials	System Stage
12	Market development for textiles	Develop end-markets (worn clothing; other household textiles add to recycling collection)	SF, MF	Textiles	Waste Prevention, Collection
14	Multi-family organic waste ban	Food and yard waste not allowed in garbage	MF	Food, yard waste, non-recyclable paper	Collection
15	Pet waste and diapers composting	Fourth bin provided for collection, material sent to appropriate treatment	SF, MF	Pet waste, diapers	Collection, Processing
16	Plastic bag ban (from stores)	Stores not allowed to give plastic carry bags to customers	SF, MF	Plastic bags	Waste Prevention
17	Every other week garbage collection	Switch garbage pick up to every other week. Keep organics picked up weekly	SF	Food, yard waste, recyclables	Collection
18	Single-family organics ban	Food and yard waste not allowed in the garbage	SF	Food, yard waste, non-recyclable paper	Collection
19	Increase enforcement of residential bans	Expand inspector enforcement of existing disposal bans	SF, MF	"Curb" recyclables	Collection
20	Reusable bag campaign	Promote reusable shopping bags in collaboration with retail stores	SF, MF	Plastic bags	Waste Prevention
26	Asphalt roofing shingles ban	Asphalt roofing shingles not allowed in garbage	SH	Asphalt (tear off) roofing shingles	Transfer
28	Floor sorting C&D loads >90%	Separately drop, sort, and recycle self-haul loads that look like all C&D debris	SH	Recyclable C&D materials	Transfer
29	Floor sorting C&D loads > 50%	Separately drop, sort, and recycle self-haul loads that look like at least half C&D debris	SH	Recyclable C&D materials	Transfer
32	Commercial organics ban	Food and yard waste not allowed in garbage	Com	Food, yard waste, non-recyclable paper	Collection
36	Carpet take-back program	Work to encourage more private recycling capacity in region; more end markets for materials; separation best practices, and take-back opportunities	SH, Com	Carpet	Waste Prevention
37	Enhance commercial organics outreach	SPU devotes more resources to persuade more businesses to sign up for organics service	Com	Food waste	Collection
38	Increase enforcement of commercial paper ban	Expand inspector enforcement of existing disposal bans	Com	Cardboard, office paper	Collection
39	Extend commercial ban to additional material	Add to list of recyclable materials not allowed in garbage (currently cardboard and office paper)	Com	Plastics, cans, glass, aluminum	Collection
41	Restore education	Restore waste reduction and recycling education, Resource Venture, to pre-recession levels	All	All recyclables	All

RPA #	Program	Description	Target Sectors*	Target Materials	System Stage
42	Paint product stewardship solution	Work toward state legislation for manufacturer funded collection system for unwanted latex paint	All	Latex paint	Waste Prevention
43	New education	SH: Resource Venture work with large self-haulers to increase diversion Small Business: Increase awareness of free cart-based recycling service	SH, Com	All recyclables, trip reduction	Collection, Transfer
44	Junk mail, yellow pages opt-out	Provide means for citizens to stop receiving unwanted yellow pages phone books and unwanted catalogues. Implemented 2011	SF, MF	Paper	Waste Prevention
45	Clean wood ban	Unpainted and untreated wood not allowed in garbage	SH, Com	Clean wood	Collection, Transfer
46	C&D in commercial ban	Recyclable C&D debris not allowed in garbage. Supersedes prior individual C&D material bans	Com	Recyclable C&D materials	Collection
50	Plastic film ban	Plastic film, such as pallet wrap, not allowed in garbage	Com	Plastic film	Collection
51	Pre-scale recycling	Increased drop off recycling convenience at rebuilt city stations by locating drop point before scales	SH	All recyclables allowed for drop off at stations	Transfer
52	Divert reusables from self-haul	Contract with private reuse business for pre-scale salvage. SPU provides storage at rebuilt south station.	SH	Construction debris, other	Waste Prevention, Transfer
411	Super education if no bans	Add even more resources to outreach and education if no bans pursued	All	All	All

*Com = commercial, MF = multi-family, SF = single-family, SH = self-haul,

Programs not Modeled

Some programs from the *Zero Waste* study were not modeled but may be reconsidered:

- **Expand alley collection in business districts —** This program is already active in parts of Seattle. Near-term expansion is likely to be minor in scale. The main purpose of this program is not to increase recycling but rather to reduce uncivil behavior in alleys.
- **Expand C&D debris drop sites —** This program idea was dropped because siting new drop sites in Seattle would be very difficult. Capacity is good at the existing facilities in the area.
- **Rate structure review for waste collection —** This program idea from the *Zero Waste Resolution* would have altered the rate (fee) structure for the commercial sector. The change would create a "heavy rate" (higher dumpster fees) for businesses that dispose of more food in their garbage. It was dropped because it would take a long time to figure out how to apply it. A ban approach would be more promising.
- **Beverage container deposit system —** This would be done through a change to state law. SPU will support working toward such legislation when there is a broader move to do so.

The modeling described above resulted in the new program recommendations that follow.

Recommendations

The recommendations to increase recycling include keeping existing programs, implementing new programs in a phased manner, and adjusting recycling goal years to align with projected achievement.

Continue Existing Recycling Programs and Policies

The recycling recommendations in this plan assume status quo programs continue to operate as is. They are the base set of programs on which the future programs build.

Implement Newly Recommended Programs

The recommended set of new recycling programs would be implemented starting now through 2020 (Table 4-13). The schedule balances a forceful push toward the recycling goals and a viable pace.

Table 4-13
Recommended Recycling Programs Implementation Schedule

Start	Program	Single-Family	Multi-Family	Self-Haul	Commercial
2010	Recyclable or compostable container food program (actual 2011)				✓
2012	Multi-family Universal Organics Service*		✓		
	Increase Enforcement Residential Bans	✓	✓		
	Carpet Take - Back			✓	✓
	Increase Enforcement Commercial Paper Ban				✓
	Junk Mail, Yellow Pages Opt Out*	✓	✓		
2013	Ban of Asphalt Paving, Concrete, Bricks*			✓	✓
	Floor Sorting of C&D Loads (>50%)			✓	
	Enhanced Commercial Organics Outreach				✓
	New Education - small business free recycle carts, audit top self-haulers			✓	✓
	Restore Education for All Sectors	✓	✓	✓	✓
2014	Single-Family Organics Ban	✓			
	Reusable bag campaign*	✓	✓		
	Asphalt Roofing Shingles Ban			✓	
	Extend Commercial Ban to Additional Material				✓
	Clean Wood Ban			✓	✓
	Plastic Film Ban			✓	✓
2015	Multi-family Organic Waste Ban		✓		
	Plastic Bag Ban (from stores)*	✓	✓		
	Paint Product Stewardship Solution	✓	✓	✓	✓
	Divert Reusables From Self-Haul			✓	
2016	Market Development for Textiles	✓	✓		
	Commercial Organics Ban				✓
	Pre-scale Recycling			✓	
2017	C&D in Commercial Ban				✓
2020	Pet Waste & Diapers Composting	✓	✓		

*Actual earlier start year: Multi-family universal organics service 4Q2011; Junk mail, yellow pages opt-out 2011; Asphalt, bricks, concrete paving ban legislation already passed and effective 2012; Reusable bag campaign 2012; Plastic bag ban 2012

✓ = Projected implementation

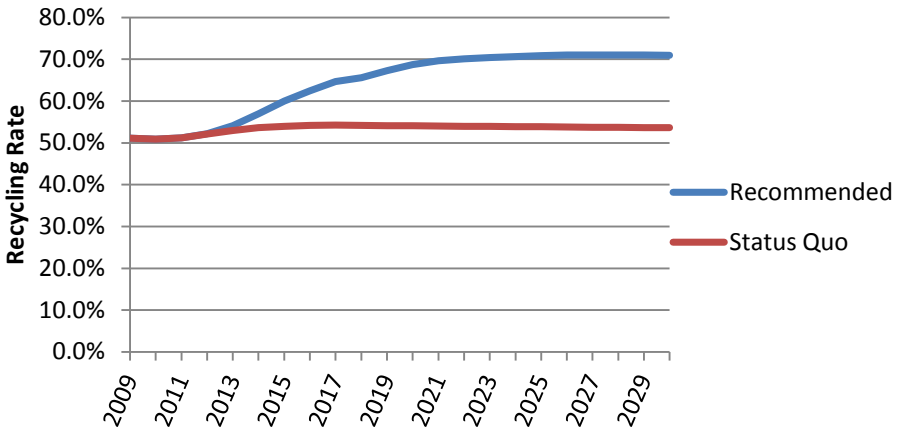
RPA projections estimate the recommended set of recycling programs will move Seattle's overall recycling rate to 60% by 2015, 3 years later than the 2012 goal set in the *Zero Waste Resolution* (Table 4-14). However, Seattle would achieve the 70% goal 3 years sooner than the resolution's 2025 goal, then rise slightly higher than the goal.

Table 4-14
Recommended Programs Recycling Rate Projections

Year	Single-Family	Multi-Family	Self-Haul	Commercial	Overall
2009 Actual	68.7%	27.0%	16.7%	54.9%	51.1%
2010 Actual	70.3%	29.6%	13.5%	58.9%	53.7%
2012	70.5%	31.0%	16.7%	56.5%	52.2%
2015	75.4%	42.5%	32.9%	63.4%	60.0%
2020	81.9%	53.0%	45.5%	72.3%	68.7%
2025	84.8%	55.3%	45.6%	75.1%	70.9%
2030	85.8%	55.7%	45.6%	75.1%	71.0%

By 2025, the recycling rate will be 17% higher than it would be if the city continues with status quo programs only (Figure 4-9).

Figure 4-9
Recycling Rate Status Quo versus Recommended



Seattle will save a sizable amount from the new programs. Total net present value for the entire package of recommendations is $19,103,133, which means overall savings through 2030. See Chapter 6, Administration and Financing, section 6.3 for detail on the financial impacts of the recommendations.

Revise Recycling Goals to 60% by 2015 and 70% by 2022

Considering the current recycling rate, and resource constraints from the recession, it does not seem likely Seattle will achieve 60% by the year 2012. RPA modeling indicates that adding the recommended actions to existing programs will get Seattle to 60% by the year 2015. Therefore, this Plan recommends adopting the new year, 2015, for the 60% recycling goal.

On the other hand, modeling for the recommended package indicates Seattle will get to 70% recycling by the year 2022. This is 3 years earlier than the 70% by 2025 goal set in the *Zero Waste Resolution*. Therefore, this Plan recommends moving up the 70% recycling goal to the year 2022.

4.3.5 Monitoring and Performance Measurement

The City of Seattle monitors achievement toward the recycling rate through the SPU annual Recycling Rate Report. The report presents sector progress as well as overall progress. It also discusses program actions and results for the year reported, as well as near-term planned actions. Chapter 2, Seattle Solid Waste Trends, covers the methodology used to prepare the report.

4.4 TRANSFER FACILITIES

The purpose of transfer facilities is to consolidate collected solid waste materials and route them to their next destination.

The City of Seattle owns and operates two transfer stations. They were built in the 1960s when waste shipment began to sites outside the city (Kent Highlands and Midway landfills). Before that, waste was disposed of in landfills within the city limits. But by the early 1960s, landfill space in Seattle ran out and the need for a large out-of-town landfill became apparent. Collection trucks couldn't efficiently travel that far, so the city needed a way to consolidate, or transfer, into larger loads for transport to the landfill. The city's stations also provide drop-off services for self-haul customers.

The city's transfer stations were renamed "recycling and disposal stations" in the 1990s, reflecting a new emphasis on their role in recycling in addition to transferring waste for disposal. They are now called the North Recycling and Disposal Station (NRDS) and the South Recycling and Disposal Station (SRDS). See Figure 4-2 for the locations of Seattle solid waste facilities. The rebuilt stations will revert to the original naming: South Transfer Station (STS) and North Transfer Station (NTS).

In addition to city-owned owned and operated solid waste facilities, two private transfer stations supplement city facilities. See the list of facilities in Table 4-1.

SPU also operates two household hazardous waste (HHW) collection facilities. One is located at the SRDS and the other at a separate location near Aurora Avenue and 125th NE. Both HHW collection facilities are operated on behalf of the Local Hazardous Waste Management Plan (LHWMP). See Chapter 5, Other Seattle Solid Waste Programs, section 5.4 for detail on the management of moderate risk waste through the LHWMP in Seattle.

4.4.1 Transfer Facilities Recommendations from 1998 Plan and 2004 Amendment

This section summaries the previous plan's recommendations on transfer facilities and their status (Table 4-15).

Status of Past Recommendations

Table 4-15
Past Recommendations for Seattle Transfer Facilities

Past Recommendations	Status
1998 Plan	
Support a flexible approach to selecting efficient transfer points for garbage and organic wastes	Done Solid waste transfer program evaluation completed 2006. Distribution of material tonnages between city/private transfer stations set to maximize system efficiency
Continue to manage recycling and disposal (transfer) stations to minimize neighborhood impacts	Since 2006, good achievement of goal to empty both pits at end of day, 98% of time.
Make capital improvements at city's existing recycling and disposal stations	Ongoing
Build a Recycling Center at South Recycling and Disposal Station (SRDS), and consider acquiring property adjacent to North Recycling and Disposal Station (NRDS) for station redevelopment and expansion	SRDS Recycling Center still pending Additional property purchased next to NRDS
2004 Amendment	
Prepare standard operating procedures and best management practices that define optimum services and safety for public, employees, and environment	Revised Stations Operations Manual 2007
Acquire additional equipment capacity to enable more efficient transportation of commodities	Ongoing Equipment inventory now meets needs
Revise layout and operation procedures for metal collection, transfer, and transportation	Installed metal loading bunker at SRDS to protect building structure 2008
Reduce customers waits by altering traffic patterns or improving other procedures	Tare weights used for collection contractors begun 2005. SRDS 2007 separated household hazardous waste (HHW) customers from station traffic, easing wait times and congestion. Since 2010 live cameras show wait line on SPU website
Develop new signage for guiding customers	Completed 2008
Consider relocation of recycling containers, and separate access for recycling	Pilot completed 2009 Included in design for new South Transfer Station (STS) and is design goal for new North Transfer Station (NTS)
Install misting system at SRDS	Done 2007
Install warming stations for floor staff	Done 2007
Improve the light level in the stations	Lamps changed out 2009
Offer additional customer service training to stations staff	Training ongoing Ongoing customer satisfaction surveys show high level of satisfaction
Direct contractor-collected garbage and yard waste between city or private stations for maximum system-wide efficiency	Ongoing
Upgrade service gates for remote open and close by truck drivers	Done 2008

Past Recommendations	Status
Replace scale house security cameras and recording systems	Completed 2009
Replace scale house computers and software	Done 2009, with enhanced reporting and automated operation for collection contractors
Repairs and equipment replacement as needed	Replaced incoming scale deck SRDS Upgraded electrical systems both stations. Repaved SRDS yard. Replaced old crew building. Constructed maintenance canopy
Proceed with environmental review for transfer station projects as appropriate under the Washington State Environmental Policy Act (SEPA)	Done
Implementation of the Solid Waste Facilities Master Plan per anticipated schedule	2007 Resolution 30990 indefinitely postponed intermodal and directed SPU to proceed with rebuilding NRDS and SRDS. New STS construction started 2009

Other Progress since 2004

Station Operations

In 2007, SPU reconfigured drainage at SRDS to direct runoff from the trailer parking area to a sanitary sewer. This action was in response to public health concerns about stormwater drainage from the site.

Also in 2007, we added closed circuit cameras to the stations, allowing station supervisors to better assess needs and allocate staff more efficiently. For improving accountability and use of overtime, supervisors also now file daily reports.

In 2008, transfer station disposal rates were increased to cover the actual cost of service. The increase allowed more environmentally friendly options, such as SPU's bulky item pickup service, which is more attractive on a customer out-of-pocket basis.

Master Facilities Plan

As solid waste management has evolved, the functions of the city's NRDS and SRDS expanded dramatically, yet the basic buildings and facilities did not change. Today the stations accept more than 10 categories of separated material—from garbage to wood waste to vehicle batteries.

Typically, transfer facilities are designed to last for 30 years. Seattle's stations have exceeded this life-span, despite limited maintenance. Overall, they are outmoded and no longer adequately handle current volumes of materials and customers.

A draft Solid Waste Facilities Master Plan was prepared to address capital needs. It includes a new Intermodal facility and improvements to the existing transfer stations. In addition, the plan addressed ways to ensure that the city can continue to transfer waste and recyclables out of Seattle. The plan included analysis of dozens of facility options using a variety of criteria. Criteria included cost, community, and environmental impacts, health and safety, and consistency with the City of Seattle 1998 Solid Waste Management Plan and 2004 Amendment, and other priorities.

The draft Solid Waste Facilities Master Plan recommended upgrading waste management facilities in Seattle as follows:

- **Improve and expand both City of Seattle transfer stations.** This would increase the size of the NRDS and SRDS by adding property at each station. The improvements would increase customer service and reduce adverse environmental impacts. And they would expand recycling and recovery of reusable materials.
- **Build an intermodal.** This would be a new dedicated solid waste transfer facility at a railhead in South Seattle. It would ensure that the city has a reliable, environmentally sound and economical way to ship waste out of Seattle.

Reconstruction of Transfer Stations

In 2007, the City Council decided not to build the proposed intermodal facility, and to proceed with improvements to NRDS and SRDS as contemplated in the 1998 Solid Waste Management Plan. Because of the need for continuous operation of recycling and disposal facilities, the approved reconstruction of NRDS and SRDS is being implemented in three stages.

Stage One: Construct New South Transfer Station. The first stage (Phase 1) involves constructing a new facility to replace the existing SRDS on a newly acquired 9.12 acre site (bus yard property). The property is diagonally adjacent to the north of the existing SRDS, north of S. Kenyon Street. The projected design and construction period for the first phase is about 3 years. Because of soil contamination and existing buildings on the property, soil remediation and site preparation had to be conducted before construction. Facility construction began late in 2010. The new facility will be called the *South Transfer Station* (STS). At the end of this phase, the city will temporarily have three stations until demolition starts at NRDS.

Stage Two: Reconstruct North Transfer Station. The second stage will be reconstruction of the NRDS. The reconstructed facility will be called the *North Transfer Station (NTS)*. The project will occur at the existing NRDS site and associated recycling area in the Wallingford neighborhood at 1350 N 34th Street, and the acquired property to the east at 1550 N 34th Street. Construction will not start until the STS Phase 1 facility is operational. This arrangement provides another facility for customers while the north facility is closed during reconstruction. During reconstruction of the north facility, solid waste, recycling, yard waste and other materials, will be temporarily redirected to SRDS.

Stage Three: Demolish SRDS. Finally, when STS is operational and the new North Transfer Station opens, demolition of the current SRDS structures will start (sometimes called Phase 2), on SRDS's 11.37-acre parcel located to the south of South Kenyon Street.

Plans to redevelop the former SRDS site were postponed while SPU focuses on the STS and NTS projects. Recycling at the STS will be located inside the new building, similar to the arrangement at the old SRDS. When SPU begins redevelopment of the former SRDS site, we may include relocated recycling drop-off, a reuse area, and a new household hazardous waste drop-off facility.

Phase 2 activities are scheduled to be integrated with remediation of the underlying landfill (Table 4-16).

Table 4-16
Seattle Transfer Station Construction Schedule

Year	North	South
2010 – 2012		STS Construction
2013	NRDS Demolition	
2013 – 2014	NTS Construction	
2015		SRDS Demolition
2016 – 2017		SRDS Reconstruction

4.4.2 Transfer Facilities Planning Issues

Recycling goals, operational issues, and moving forward on capital improvements characterize the issues related to transfer facility planning.

Keeping Existing Stations Functional until Rebuilt

During preparation of the Solid Waste Facilities Master Plan, it became apparent that some level of ongoing capital program was needed at the NRDS and SRDS. From 2004 to the present, a miscellaneous station improvements project has been used to fund necessary capital improvements at the NRDS and SRDS. Improvements range from replacement of a failing scale deck to resurfacing the asphalt at SRDS. These smaller projects are required to maintain safety and reliability at the stations while they are still in use.

Transitioning to New Facilities

The new flat floor stations will operate very differently from the existing stations. Training will begin in 2011 to prepare staff for this change. Training will be based on the operations plan for STS (under development). The equipment in the stations will be more advanced for better electrical efficiency. Maintenance staff will need training to properly operate and maintain it. Staffing plans for the transitional periods are complete. All heavy equipment purchases are now compatible with the new stations.

The 60% Recycling Goal

The new stations will encourage more recycling by increasing the convenience of the recycling and reusables drop-off areas. Drop-off services will be available to self-haul customers before they enter the station. This layout makes it possible for self-haulers with just recyclables to avoid crossing the scales and main station. Although it is unclear at this time whether this will be feasible at NTS, every effort will be made to make recycling drop off within the station as convenient as possible.

In addition, both stations will have flat floors to allow heavy equipment to sort large recyclable items. Flat floors are also more flexible and allow separating new waste streams in the future. For example, at STS SPU will consider sorting self-hauled loads of comingled C&D.

The Alaskan Way Viaduct Replacement Project

The Alaskan Way Viaduct Replacement Project will temporarily disrupt a thoroughfare heavily used by collectors and city hauling. Current estimates say the viaduct will close for construction for 4 years. When the viaduct is closed for safety, or during replacement, the impact to solid

waste operations will be substantial. Currently, 120,000 tons of garbage and 550 trailer loads of recycled metal from the NRDS are moved through this corridor each year. Previous experience with viaduct closures have given us some data on increased hauling times and the additional effort required to maintain service levels. Each round trip through the corridor will increase by about an hour.

Equitable Service Goals

The transfer stations are a critical part of the Seattle's solid waste system. Allotting transfer station capacity between the north and south ends of the city improves collection efficiency and creates convenient access for self-haul customers. With a two station system, the effect of solid waste activities is not concentrated in any one area.

Balancing Customer Service and Trip Reduction

While customer service goals are important, SPU also has a goal to encourage a decrease in self-haul vehicle trips, to minimize traffic into the stations' surrounding neighborhoods.

Maintaining Progress on Facility Rebuilds

The STS is under construction. SPU is also working with the NTS stakeholder group to define a facility that will serve our customers and be a good neighbor. Resolution of uncertainties at the NTS is critical to the schedule of SRDS and long-range operational planning.

Planning New Functions for SRDS Site

Current planning assumptions for the SRDS site (after the old structures are gone) include a recycling facility, reuse collection and sales, household hazardous waste collection and ancillary trailer parking for the new STS. The final design for this site will also reflect additional program needs identified over the next 3 years. Some of these needs will be market driven. For example, as carpet recycling options come into use, they will require programmed space to take advantage of this waste diversion opportunity.

Shifting Capital Planning

Capital planning shifts to major maintenance and equipment replacement after the rebuilds are done. The new facilities are designed for a 50-year service life. Once constructed, major capital replacement projects, including compactor replacement, floor resurfacing and facility roof replacement will need to be planned. If the private transfer stations stop accepting waste, maintaining the city's transfer facilities will become even more critical to ensure adequate transfer capacity in Seattle.

4.4.3 Current Transfer Facility Programs and Practices

Transfer Station Operations

The city's transfer facilities perform the same basic functions they have since they were built. They receive discards and send them on to their next destination. They now serve a wide variety of vehicles and customers, and receive a range of discarded materials that include garbage,

recyclables and compostables. All materials are loaded into transfer containers and shipped to their next destination.

The stations play an important role in accepting materials unsuitable for curbside collection. Residents with large, bulky items or excess quantities can bring these materials to the stations for recycling or disposal. The stations also serve businesses that choose to self-haul their waste and recyclable materials.

Primary service levels have been adopted for transfer stations:

- Stations are open and available 362 days/year from 8 AM to 5:30 PM to our self-haul and commercial customers
- All garbage and organics are loaded into shipping containers or trailers (organics) at the end of each work day

Transfer Station Trends

Collection contractor trucks bring in 2.5 times as many tons as self-haul customers, yet they are only 14% of total trips. Tables 4-17 and 4-18 show the number of trips and tons of material transferred through the NRDS and SRDS.

Table 4-17
Transfer Services for Contractor-Collected Garbage and Yard Debris to NRDS and SRDS in 2010

	NRDS		SRDS		Total	
Waste Type	Trips	Tons	Trips	Tons	Trips	Tons
Residential Garbage	13,355	46,166	13,155	62,662	26,470	108,828
Commercial Garbage	2,557	47,476	3,594	32,410	6,151	79,886
Yard Debris	4,788	28,724	2,212	11,262	7,000	39,986
Total	20,700	122,366	18,921	106,334	39,621	228,700

Table 4-18
Self-Haul Service Provided by NRDS and SRDS in 2010

	NRDS		SRDS		Total	
Waste Type	Trips	Tons	Trips	Tons	Trips	Tons
Self-Haul Garbage	95,459	37,923	73,384	41,369	168,843	79,292
Self-Haul Yard Debris	16,342	3,715	15,915	3,966	32,257	76,82
Self-Haul Wood Waste	1,026	344	969	465	1,995	808
Other Self-Haul Recycling	26,545	2,415	15,971	1,733	42,516	4,149
Total	139,372	44,397	106,236	47,534	245,611	91,931

One of the primary challenges at the recycling and disposal stations is managing the volume of self-haul customers. Although handling a high volume of customers with small loads is relatively costly, providing convenient self-haul services for residents and businesses is an important SPU objective. SPU wants to encourage self-haul customers to make more use of the more efficient curbside services, which are usually less costly.

In 2009, about 60% of contractor-collected organics was delivered to the NRDS and SRDS stations. The remaining 40% was delivered to Waste Management's Eastmont transfer facility. About 75% of municipal solid waste (MSW) was transferred at the city's recycling and disposal stations and the remaining 25% (primarily commercial garbage) was transferred at Eastmont.

Waste Management's Eastmont station transfers MSW and organics under contract to the city. Republic (formerly Allied Waste) operates the Third and Lander private transfer station and currently transfers a minimal amount of city MSW. This material is the rejected portion of recycled materials (contamination) sorted under city contract. All public and private solid waste facilities are permitted and regulated under the authority of Public Health - Seattle and King County.

Accepted Materials

Materials currently accepted at the city-owned stations include:

- Garbage
- Organics (yard, food, clean wood)
- Recycling (curb recyclables accepted at the processor: glass, mixed paper, plastics, cans, etc. Also included are large appliances and other bulky metal items not suitable for curb-side collection)
- Special wastes (properly prepared or pre-approved sharps, tires, contaminated soils, vehicle batteries, used motor oil)

The process for designating materials for curbside recycling is described in section 4.5. Other separated materials are added or subtracted from the list of accepted materials when the volume, value, or environmental issues associated with disposal change. For example, porcelain toilets were accepted as recyclable materials until the economics of them changed, and the costs and impacts of recycling the toilets exceeded their market value.

Trucking Operations

SPU owns and operates a fleet trucks and trailers to haul transferred materials away from the two city stations. Waste Management owns the containers used for the garbage rail haul. All garbage is loaded into sealed 40-foot intermodal containers and hauled to the Union Pacific Argo yard at 6th and Dawson. At that location, full containers are placed on a unit train and an empty container is returned to the transfer station via truck. Yard waste and other organics are transported to Cedar Grove in Everett or Maple Valley for processing. Other materials are also transported to recycling facilities in the local area.

Station Administration

City staff also performs the other functions at the stations:

- Scale operators weigh vehicles as appropriate and collect payment from self-haul customers. To the extent possible, they also screen incoming loads for unacceptable materials and compliance with Washington State covered load law.

- Floor workers direct vehicles and keep the operational areas clean and safe. They also keep an eye out for unacceptable materials.
- Administrative employees ensure personnel and other resources are appropriately allocated. They also generally see that staff has what is needed to do their jobs well and safely.

Operations and maintenance costs for the two recycling and disposal stations were approximately $7.3 million in 2009. In addition, SPU Operations spends about $2 million per year on heavy equipment capital purchases.

Trip Reduction

In 2008 and 2009, following the Zero *Waste Resolution*, SPU studied self-haul traffic coming to the north and south transfer stations to determine what steps could be taken to reduce vehicular traffic. Consultant recommendations fell into three action areas:

- Spread traffic into less busy periods
- Shift resident self-haul trips to curbside collection alternatives
- Shift C&D waste trips to other disposal or recycling stations

Based on these recommendations, SPU placed web cameras at two locations at each station showing the length of waiting lines. Beginning May 2010, by going online, customers could view congestion and possibly choose a less busy time for their trip. The web cam system is likely to reduce congestion around the stations but is unlikely to reduce total vehicle trips.

Other strategies to spread trips through station operating hours, such as time-of-day pricing and extended hours during summer when the stations are busiest, may be studied further for later implementation. In the short run, extending station hours is likely to prove cost-prohibitive. Reduced disposal volumes have reduced revenue. Increasing operating hours would increase costs.

In 2010, SPU began modestly promoting curbside collection services as an alternative to self-haul trips, using the *Curb Waste and Conserve* newsletter and the web pages connected to the web cam congestion-viewing service. We plan to increase promotion of curbside services when revenues permit. The alternatives to self-haul trips include using:

- Bulky-item collection service, available at the same price as self-haul drop-off
- Extra garbage set-outs
- 96-gallon yard waste service or extra yard waste set-outs when needed

All these services are priced comparably with self-haul. Some additional strategies remain under consideration for the future, including mandatory bulky-item curbside collection of appliances.

Perhaps more significant self-haul trip reduction can result from policy changes affecting C&D wastes. Among policy options is redirection of certain kinds of C&D loads to other stations, particularly those with high recyclable materials recovery rates. Banning the disposal of certain C&D materials should noticeably reduce vehicle traffic at the disposal

stations. See the MSW self-haul ban recommendations in section 4.3.4, and Chapter 5, Other Seattle Solid Waste Programs, for more detail on C&D waste.

Facility Improvements

SPU has made the following progress:

- **South Transfer Station —** In early 2010, SPU signed a design-build contract through competitive bid. Discovery of soil contaminants on the new site delayed ground breaking. Site remediation was completed and ground breaking occurred in November 2010. The rebuilt station will open mid-2012.
- **North Transfer Station —** As of this writing, SPU is nearing completion of working with the stakeholder committee to choose a site utilization (design) concept for the site. The stakeholder committee consists of neighborhood representatives and major users of the current facility. After that, SPU plans to choose a design-build contractor.

4.4.4 Transfer Facilities Alternatives and Recommendations

Recommendations involving transfer facilities fall into the major categories of new recycling initiatives and decisions about the transfer system itself. See section 4.3 for all the new recycling recommendations affecting every part of the MSW system.

This plan revision continues to promote goals for transfer functions spelled out in the 1998 Plan and 2004 Plan Amendment:

- Increase recycling, as self-haul sector's contribution to the city's overall recycling goals
- Increase efficiency, convenience and accessibility of services

The alternatives considered in this Plan focus on programs to make new gains toward these goals with an eye to optimizing transition to the rebuilt facilities.

Transfer Facility Recycling Recommendations

Transfer facility recycling recommendations mainly strive to divert more recyclable material from the self-haul waste stream by:

- Banning certain materials from disposal in the garbage
- Making reuse and recycling drop-off more convenient
- Educating self-haulers about recycling opportunities

Transfer Facility System Recommendations

Transfer system recommendations optimize current station functions and anticipate the rebuilt facilities.

Keep Up Old Stations as Needed

According to the current rebuild schedule, the old SRDS will be in use until the new north facility is complete in 2014. SPU will continue to maintain all structures, systems,

and equipment as needed to keep old facilities safe and functional as long as they are in use.

There are no viable alternatives to the use of these stations; they must be kept up.

Interim Major Purchases should be Compatible with Rebuilt Stations

This recommendation applies mainly to equipment purchases. Compatibility is as important as cost. For example, SPU could potentially save in the near term on purchases that work in the old facilities but do not suit the new facilities. If the useful life of equipment extends over the transition to the new stations, then the larger cost may be warranted. SPU will incorporate this analysis into all major purchasing decisions.

Incorporate Equitable Service Goals into Operations

From signage, to information handouts, to customer interactions, station operations will look for opportunities to make service equitable for all Seattle's populations, particularly the historically underserved.

Implement Trip Reduction Strategies without Compromising Customer Service

SPU will continue to offer live views of customer lines via the SPU website. We will increase promoting curbside services, like larger cans, bulky item pick-up, and extra set outs, when resources allow. Additional strategies will remain under future consideration, such as mandatory bulky item curbside service. Such strategies will include analysis for impacts on the essential community services that the stations provide.

Implement Alaskan Way Viaduct Project Contingency Plan

When the viaduct's closure schedule is better known, SPU will evaluate options and implement the chosen strategy. The chosen option largely depends on the status of the city station rebuilds.

Each option will have associated capital or operations and maintenance cost. Each option also affects the city's collection contractors to one degree or another. The collection contracts contain provisions for such impacts.

Rebuild Transfer Stations

As contemplated in the 1998 Plan and 2004 Plan amendment, SPU will rebuild the north and south transfer stations, at their present sites or on adjacent property. This will increase recycling and efficiency and reduce impacts on the neighboring communities, environment, our customers and employees.

The capacity provided by the rebuilt facilities, in conjunction with existing private transfer capacity, is projected to satisfy Seattle's solid waste transfer needs for at least as long as the 50-year expected life of the rebuilt facilities. SPU has no plans to develop any new solid waste handling facilities. Should a private company seek to construct a new solid waste handling facility in Seattle, approval from Public Health - Seattle & King County is required, in addition to land-use approvals from the City of Seattle. See section 4.5.2, Planning Issues, Solid Waste Facility Siting for discussion about siting guidelines.

Continue Existing Station Recycling Functions

Current recycling services at the existing transfer stations will continue. Enhancements to recycling at the stations will be associated with the new facilities. It is not feasible to add recycling functions to the existing stations. Those stations are already handling more tons and more material streams than that for which they were originally designed.

Continue Planning Transition to New Facilities

SPU will continue to refine staffing and equipment needs estimates for each stage of the transition to the new facilities.

Plan for South Recycling and Disposal Station

SPU will renew planning for the SRDS old site when resources become available and decisions on NTS are made. Priority will be given to reuse and recycling. If future recycling gains lag significantly below expectations, a facility that sorts unsorted discards (a "dirty" recycling facility) may be considered.

4.4.5 Monitoring and Performance Measurement

Performance monitoring of the transfer stations is ongoing. The focus ranges from day-to-day operations to contribution to the 60% overall recycling goal. The City of Seattle has tracked the following measures for years and will continue to do so:

- **Station Availability.** This is a measure of reliability. It monitors scheduled station open times against times when a station must be closed to incoming traffic. Station closures are typically event-driven, some more controllable than others, such as compactor failure or dangerous material found in the tipping area.
- **Customer Turnaround Time.** This measure monitors the numbers of minutes elapsed from the time vehicles cross the inbound scales to the time they cross the outbound scales. Collection trucks and other vehicles have their own targets.
- **Removing All Waste from Facilities Each Day.** Waste sitting in tipping areas overnight can release odors into surrounding neighborhoods, especially in summer. SPU strives to empty the tipping areas at the end of each day, at least 90% of the time.
- **Satisfactory Inspections by Public Health.** As the regulatory agency for solid waste handling facilities, Public Health - Seattle and King County regularly inspects City of Seattle stations. Because compliance is important, SPU includes tracking the inspections in departmental performance monitoring.
- **Customer Satisfaction.** Customer satisfaction is tracked regularly at the stations through simple feedback cards given out to customers at the stations. Questions about the stations are also included in SPU's regular community-wide phone surveys.
- **Transfer Cost Efficiency.** This measure calculates the most recent cost per transferred ton compared to similar periods in the past. If a significant variance emerges, it signals station management to investigate the reasons for the variance.
- **Self-Haul Recycling Goal.** Within the overall 60% recycling goal, each sector has its own goal. Since City of Seattle transfer stations are the sole service providers for the

self-haul sector, the stations monitor annual recycling performance for this sector. See section 4.3 for a discussion of the influences on the self-haul recycling rate.

4.5 PROCESSING AND DISPOSAL

This section covers the end points of Seattle's MSW system: processing and disposal. *Processing* refers to the sorting of recyclables at the recycling facility and the composting of yard and food waste. See section 4.2, Collection, for how the materials arrive at facilities. Once processed, materials go to private enterprises for further processing or to markets. *Disposal* means landfilling, including the rail haul to the landfill.

4.5.1 Recommendations from 1998 Plan and 2004 Amendment

Table 4-19 summarizes processing and disposal recommendations from previous plans.

Table 4-19
Past Recommendations for Processing and Disposal Seattle MSW

Recommendation	Status
1998 Plan	
Support development of new organic materials processing capacity for yard and food waste	Local processor well established. Multiple sites and now taking food
Establish environmental standards or performance criteria for organic materials processing facilities in evaluating new contract proposals	Contract requires processor to comply with environmental and health laws
Long-haul landfill disposal of garbage will continue	Done
Create economic development incentives for local recyclables manufacturing, and processing facilities	No action
Encourage the development of food waste processing facilities in the region	Currently one major food composting service provider with two sites
2004 Amendment	
Explore promising new technologies for processing	Continuing to monitor new industry developments. Improvements at contractor's plant allowed more materials and single-stream recycling starting 2009
Evaluate costs and benefits of co-mingled recycling collection	Successfully negotiated contract with recycling processor for co-mingled materials. All materials, including glass, co-mingled starting 2009
Evaluate costs and benefits of terminating, amending, or continuing the long-haul disposal contract prior to 2009 opt-out date	Contract successfully amended with reduced payments and opt-out dates extended to 2019 and 2021

4.5.2 Planning Issues

Planning for processing and disposal requires looking at issues affecting recycling, composting, and landfilling.

Flow Control

All Seattle's MSW that is not recycled or composted is, by law, under city control. The City of Seattle has arranged for and committed to transporting this waste via train to the Columbia

Ridge Landfill as specified in Seattle's long-haul and disposal contract. See Chapter 5, Other Seattle Solid Waste Programs, section 5.1 for detail on C&D flow control.

Processing and Disposal are Contracted Services

The City of Seattle contracts with private service providers for recycling processing, organics composting, and landfill long-haul and disposal. Any programmatic changes would be made through those contracts. Public Health - Seattle and King County regulates recycling and composting processing facilities and issues the required solid waste permits.

Since the 1960s, the City of Seattle has acknowledged that it is unfeasible to site a new landfill within the city limits. A 1988 alternatives study noted that 270 acres of undeveloped land would be needed for a reasonably efficient landfill. Our 1989 plan, *On The Road To Recovery: Seattle's Integrated Solid Waste Management Plan*, summarized the results of the 1988 study. The report found several factors limited the city's landfill options. Continuing to use King County's landfill was very expensive. It was unfeasible to locate a new landfill in Seattle or the local area. And there was very negative public reaction to incineration. Given those limitations, landfilling in an arid region was considered the best way to meet environmental standards and provide long-term MSW disposal capacity.

Solid Waste Facility Siting

Because this Plan contains no proposal to locate solid waste disposal facilities in Seattle, we do not present an analysis of potential sites that would be required by law.

Disposal Facilities

Washington State law prescribes that local plans that include the siting of disposal facilities must evaluate potential alternative sites. RCW 70.95.090 (9) requires that solid waste management plans include:

> *"A review of potential areas that meet the criteria as outlined in RCW 70.95.165"*

In turn, RCW 70.95.165 (1) states:

> *"Each county or city siting a solid waste disposal facility shall* review each potential site for conformance with the standards as set by the department for:*
>
> *(a) Geology;*
>
> *(b) Groundwater*
>
> *(c) Soil;*
>
> *(d) Flooding;*
>
> *(e) Surface water;*
>
> *(f) Slope;*
>
> *(g) Cover material;*
>
> *(h) Capacity;*
>
> *(i) Climatic factors;*
>
> *(j) Land use;*

(k) Toxic air emissions; and

(l) Other factors as determined by the department.

*[Emphasis added.]

Read together, a solid waste management plan is to evaluate potential areas for the location of a solid waste disposal facility only if a disposal facility is proposed to be sited in the city. No disposal facilities are proposed to be located within the City of Seattle for the term of this Plan, and it is highly unlikely that a disposal facility would ever be located within the City of Seattle because Seattle is a fully developed, densely populated urban center. Furthermore, a city-built disposal facility would violate terms of the City of Seattle's contract for distant landfill disposal (which runs through 2028). Also, Seattle flow control ordinances prohibit any public or private party from taking any waste generated from within the Seattle city limits to any other disposal facility.

In short, because no solid waste disposal facilities are proposed to be located in Seattle, and would not be allowed in Seattle were they to be proposed, this Plan does not contain an analysis of potential disposal sites as described in RCW 70.95.165 (1).

Handling and Transfer Facilities

As stated above, the Solid Waste Management Act, RCW 70.95, only requires a potential analysis of alternative sites for the location of solid waste disposal facilities. Contrary to statements contained in Ecology guidelines, the Act does not require an analysis of alternative locations for the siting of other types of solid waste facilities, such as solid waste transfer stations. However, in response to citizen comments regarding this Plan, the city offers the following comments regarding the application of the disposal facility standards to the siting of transfer stations.

Of the standards (a) through (k) listed in RCW 70.95.165 above, almost none are relevant siting criteria for transfer stations. "Cover material" obviously is a landfill issue and has no relevance for transfer stations. "Climatic factors" has no relevance for transfer station siting; presumably it has to do with the effect of precipitation/evapotranspiration on leachate generation in landfills. "Toxic air emissions" appear to be relevant to garbage incinerators and perhaps landfills, but not transfer stations. "Geology, groundwater, soil, flooding, surface water, slope, and capacity" are all potentially relevant for the design and cost of a transfer station. However, none of them are factors to preclude the siting of a transfer station.

The one criteria that is relevant for transfer station siting is (j) Land Use. If the city were required to apply this criterion to siting of a new transfer station at some point in the future, the city would limit the location of the facility to sites where such a facility would be permitted by the city's land use regulations.

Future Capacity

Recycling Processing

Recycling capacity in the Seattle area is not considered an issue for the planning period. Seattle's current contract is guaranteed through 2019. Furthermore, the Washington State Department of Ecology currently lists more than 280 recycling facilities in King, Pierce and Snohomish counties. At least three of these are large facilities that process

mixed recycling and are within 20 miles of Seattle. SPU expects the many other private recyclers that handle limited ranges of materials to continue their presence in the local market.

Composting

Current capacity is adequate. However, statewide there is concern about future capacity as more cities and counties divert more organics. Some believe that the present regional organics processing system cannot handle peak summer organics without creating odor problems. Seattle's provider is the only large-scale firm in the local area taking mixed yard and food waste, with two locations within 25 miles of the city. Our current contract is guaranteed through 2013 with renewal options through 2015.

Landfilling

Columbia Ridge landfill, Seattle's current landfill, projects that it will be able to receive material beyond the current contract's guaranteed 2028 end date. Rail-haul capacity has not been an issue. The contract provides for alternate transportation if rail lines become unavailable for a time. Other private landfills east of the Cascades project ample capacity for decades, according to the Washington State Department of Ecology, Solid Waste in Washington State, 18th Annual Status Report

Shifts in Materials over Time

Recycling

As discussed in the section on collection, consumer patterns change over time. Likewise, new materials and combinations of materials continue to enter the consumption cycle. SPU must conduct waste composition analyses frequently enough to be able to respond to these changes. (For example, we will continue to work with processors to designate additional recyclable materials, and modify collection programs as needed.)

Composting

As with recycling, what is in the composting stream can change over time. An example of this is Seattle's 2009 ordinance requiring quick-serve restaurants to use compostable, recyclable, and reusable packaging. Our composting contractor worked with private industry to develop truly compostable packaging. Now more of these materials are entering the compost stream. As more and more packaging claims to be compostable, SPU needs to work with the processor to monitor these materials and design upstream program changes as needed.

Landfilling

As diversion becomes more effective, the composition of material entering the landfill will shift. This is not expected to affect Seattle's contract. However, it's important to stay informed about changes. For instance, less landfilled organic material could reduce the amount of landfill gas sent to the landfill gas-to-electricity (LFG) energy system being developed at the Columbia Ridge Landfill.

Processing Efficiency and Source Separation and Collection

Recycling

Contamination has increased as we continue to add more materials and move to full single-stream (co-mingling all recyclables) collection. However, Seattle's contracted facility, which went through a major rebuild in 2008, appears to be separating materials well. Glass, shredded paper, and plastic bags are primary challenges.

Composting

The potential is increasing for more contamination in yard and food waste streams as Seattleites increasingly become aware of the opportunity to compost food packaging. Many of these products look much like non-compostable versions. It is important for SPU to work with its organics processing contractor to monitor contamination rates, work toward compostable product labeling, and educate customers on how to avoid processing issues.

Emerging Technologies

Recycling

Recycling facility technology improvements have made it possible to implement single-stream recycling collection. This is a key advance toward increasing recycling rates. Future advances could make more materials recyclable or improve the quality of materials sent to market.

Composting

As regional demand for composting increases, SPU's contractor and others are researching and developing new technologies. For example, SPU's current contractor is planning to install an anaerobic digester at a facility serving Seattle. Anaerobic digestion is mainly done to recover energy. However, its development can also introduce more capacity and more competition for processing the wetter part of the organics waste stream that is mostly food waste. It is important that facilities we use employ technologies compatible with Seattle's solid waste management goals.

Disposal

Private entrepreneurs are developing an array of alternatives to landfilling. Most of these are various forms of combustion, pyrolysis or gasification. Most of these technologies involve large capital investment. To pay off the investment, such facilities require a minimum daily level of material over an extended time. These restraints act as a disincentive to recycling. On the other hand, landfilling requires no daily minimum and less material disposal extends the life of the landfill. Seattle has ready alternatives to combustion and other capital-intensive disposal technologies by increasing waste reduction, recycling, and composting as well as good long-term access to landfilling.

4.5.3 Current Processing and Disposal Programs and Practices

SPU contracts with two processors for the material we count as recycling:

- **Rabanco Recycling Center** — mainly traditional recycling (newspaper, glass bottles, tin cans, etc.)
- **Cedar Grove** — mainly organics (yard trimmings and food waste)

These two facilities process all of the recycling and organics collected by the city's contractor and that come through Seattle transfer stations.

The Rabanco recycling facility processes about 27% (2009) of all Seattle's recyclables. Primarily, these are traditional recyclables collected by Seattle's contracted haulers and some privately collected material from the commercial sector.

The Cedar Grove composting facility processes about 33% (2009) of all Seattle's recyclables. These include all organics collected by Seattle's contracted haulers and some privately collected material from the commercial sector. All separated food waste goes to Cedar Grove.

Other private processors receive material directly from commercial businesses. These include traditional recyclables and other recyclables such as appliances, consumer electronics, tires, metals, etc. Still other private providers receive clean yard waste (no food).

Table 4-20 shows the tons of material that was recycled and composted, by sector, for the 10-year period ending 2010.

Table 4-20
Material Recycled in Seattle 2000 - 2010

Year	Single-Family	Multi-Family	Self-Haul	Commercial	Total Tons
2000	120,969	12,611	21,141	162,989	317,710
2001	120,910	15,124	22,148	149,522	307,539
2002	118,640	15,068	22,729	149,029	305,260
2003	118,322	16,043	22,365	126,597	283,083
2004	123,103	16,142	23,069	159,627	321,655
2005	128,197	18,245	23,865	179,456	349,763
2006	138,868	19,903	24,015	215,333	398,118
2007	142,634	21,261	25,447	220,011	409,352
2008	139,928	21,024	20,415	213,493	394,860
2009	147,786	19,028	16,328	184,593	367,735
2010	152,175	20,887	12,625	203,511	388,898

For disposal, the City of Seattle contracts with a single provider, Waste Management, for the rail haul to and disposal at their landfill in Arlington, Oregon. The following sections give more detail about Seattle's recycling and disposal contracts.

Recycling Processing

Seattle currently contracts with Rabanco, Ltd. (a company under Allied Waste Services, a Republic Services company) for recycling processing at their Rabanco Recycling Center and Transfer Station. The Rabanco facility is located in Seattle's industrial area south of downtown at 3rd Avenue South and South Lander. The current contract began April 1, 2009 and it is guaranteed through 2013. By city choice, the contract can be extended to March 2016. By mutual choice, it can be extended to 2019. SPU will review options for the future well ahead of those deadlines, with enough time built in to pursue the chosen contracting approach.

The contractor is responsible for processing and marketing all recyclables collected under city contracts with these provisions:

- Hours open to city collections trucks
- Collection truck in-and-out (cycle) time
- Capacity to receive, process and store a week's worth of materials in 1 week
- Residuals limits
- Transporting material to markets
- Reporting requirements
- Recycling market risk sharing
- Backup recycling facility in the event of a temporary shut down
- Employees (permanent jobs, living wage, benefits)

More than 40 people work at the 80,000-square foot facility to sort and bale recyclables so they can be made into new products. Quality control inspectors measure contamination and commodity types in incoming loads of recycling. A virtual tour of the facility may be viewed on SPU's website.

Most commercial recycling is provided by private arrangements. Vendors collect both mixed and source-separated materials, and take them to a variety of processors. Which processor they use depends on the material and any agreements haulers and processors may have. Depending on the quantity and type of materials recycled, commercial customers who recycle may receive revenue, receive free collection, or pay a fee. Recycling is usually lower cost than disposal.

Designation of Recyclable Materials

The process by which materials are designated as recyclable for Seattle's collection programs is through contract negotiation with the processor. Seattle considers processing costs, commodity markets, customer interests, alternative recycling options, and other factors in negotiating and designating recyclable materials. The processing contract prohibits disposal of designated materials.

Information on currently recyclable materials is best viewed on SPU's website. The last time materials were added was with the implementation of new collection contracts in 2009. As noted, opt-out dates for the current processing contract are 2013, 2016 and 2019. These are the next points at which SPU could seek a change to the list of designated materials without a change to the present contract. SPU will notify the State of Washington Department of Ecology when any changes are made to the designated materials.

The recycling collected by Seattle's contracted collectors becomes their property upon collection. It becomes the processor's property when it is dropped off.

SPU pays its contracted recycling processor monthly at a set price per ton to process the materials. The actual amount we pay each month depends on tonnage volume and commodities prices for the processed materials. SPU bears 100% of the risk (and benefit) of market price changes for recyclables. The contract sets a base price for the various commodities. If market prices are higher, then we receive a "credit" (savings) on our processing bill. If market prices are lower, the processing bill goes up (an extra cost). Even during the recent recession when commodities prices dipped significantly, all the recyclable materials went to market (none were landfilled). Markets have since recovered.

Over the past 10 years, the city has added materials to its recycling program (none were dropped). Seattle has the good fortune of being a major West Coast port with excellent access to domestic and foreign markets. The processing contract does not allow the processor to dispose recyclable materials without SPU's specific permission.

Privately (commercial sector) collected recyclables are privately processed and traded. These materials include those in our recycling collection program as well as others. The city's required annual recycler reporting that began in 2007 garners information on the companies involved and the materials they handle. It is a complex system where one material could be handled by several different companies in turn. It takes SPU months to sort out the resultant "double counting" for the annual recycling report. An example of the reporting form the companies must use can be seen in Appendix E, Recycling Businesses Reporting.

See Chapter 3, Waste Prevention, for a discussion on Seattle's market development activities.

Yard and Food Waste Composting

The city contracts for processing food scraps and yard debris with Cedar Grove Composting, Inc. under a service contract that began in April 2001. The most recent contract amendment will end in March 2013, with city options to extend service to March 2014 and March 2015. Current organics processing includes yard waste, all food waste, compostable (food soiled) paper and other approved food packaging. Seattle's material primarily goes to the Cedar Grove Maple Valley facility. Material from north Seattle goes to the company's facility near Everett.

The contract with Cedar Grove requires them to process the material into a marketable product, such as soil amendment. They may not deposit material at a landfill or incinerator. Marketing of the product is at the contractor's risk, expense and profit (or loss). Among the contract's further provisions are the following:

- Compliance with all applicable ordinances, zoning, and regulations (health and air)
- Primary facility (Maple Valley)
- Hours open to city trucks and city collection contract trucks
- Handling and disposal of contaminated waste
- Pilot tests of new processing methods or services
- Food waste customer education, for commercial businesses and all information materials
- Reporting
- Back-up facilities in the event of a temporary shutdown

Once delivered to the facility, grinders shred the material, and then conveyors move it to aeration areas specifically designed and constructed for controlling the aeration process. Blowers and special covers also control the process whereby naturally occurring microbes degrade the material. The covers also control odors. At further stages in the process, the material is moved to other piles. The end-stage piles are not covered. In the final stage, the material is screened and blended into a mix for bags or bulk use. For more details about the composting process visit Cedar Grove's website.

Seattle's contract with Cedar Grove was amended to incorporate food waste and compostable paper processing in 2004. Seattle began collecting vegetative food waste and compostable paper with the distribution of household yard waste carts in 2005. The service was expanded to all food waste in 2009 with the change to weekly pickup associated with Seattle's collection contracts changes. Cedar Grove also conducts compostable food service products testing.

Cedar Grove is continually looking at ways to improve its operations. In 2010, they announced they will collaborate with a company to build an anaerobic digester at their Everett facility and integrate it with their processes. The project will generate biogas for automotive fuel or for producing electricity. They are also working with their surrounding communities on improving strategies for controlling occasional odor issues during the warm months.

Cedar Grove has been able to receive and process all the material they are obligated to under their contract with Seattle. Longer term, the Washington State Department of Ecology's *Beyond Waste* plan (2009) recognizes that the regional and local capacity for processing organics needs to grow with increased recovery. Ecology plans to identify and pursue effective incentives toward this end. SPU will stay apprised of these activities, and continue to promote backyard composting and grasscycling. SPU will also continue to encourage or require city department purchases of local compost product for public projects. See Chapter 3, Waste Prevention, for detail on how to minimize Seattle's need for centralized composting.

Rail Haul and Landfill Disposal

The City of Seattle contracts with Waste Management of Washington (Waste Management) for rail haul and disposal of all nonrecyclable waste at Columbia Ridge Landfill in Gilliam County, Oregon. This contract has been in place since 1990. It was

most recently amended (Amendment 3) in 2008. It expires in 2028, with city opt-out dates before then.

After it has been compacted into shipping containers at transfer facilities, garbage is hauled to the Argo rail yard (receiving facility) and loaded onto the train. The Argo Yard is owned and operated by the Union Pacific Railroad, and is located in the industrial area south of downtown Seattle at 4th Ave. S. and S. Dawson. Trains leave Seattle six times a week, stacked two-high. Waste Management of Washington owns the containers.

The Columbia Ridge Landfill and Recycling Center is owned and operated by Oregon Waste Systems, a division of Waste Management. Gilliam County is in an arid region east of the Cascade Mountains. The landfill site has operated since 1990 and is permitted and regulated by the Oregon Department of Environmental Quality.

Trains hauling city waste unload the containers at an intermodal siding on the landfill site. Tractors haul the containers to the active area to be tipped. The active part of the landfill (Module 20) has capacity for 2 million tons.

The contract contains further provisions for:

- Partnership incentive (partner waste)
- Rail yard hours open to receive full containers
- Container storage capacity (2 days)
- Truck turn-around time
- Container data and reporting (number of containers available, storage availability, location, and transfer station of origin)
- Truck scales, intermodal lift trucks
- Backup receiving facility (intermodal rail yard): Terminal 18, Port of Seattle on Harbor Island, Seattle
- Unacceptable containers (leaky, prohibited waste)
- Locomotives and double-stack rail cars
- Alternate rail lines
- Landfill design and operation meet Washington and Oregon standards
- A screening program at the landfill for unacceptable wastes
- Incremental landfill closure and post-closure care
- Special Waste Management Plan (special handling for asbestos, construction and demolition debris, and contaminated soils)

As of the 2008, contract amendment with Waste Management, WM Renewable Energy, LLC was developing and permitting the landfill gas-to-electricity system at the Columbia Ridge Landfill. The city has the right to purchase all of the energy produced by the LFG system.

4.5.4 Alternatives and Recommendations for Processing and Disposal

Recycling Processing

Any significant alternatives that involve recycling processing relate to the processing contract. These could be interim contract amendments or longer term changes in Seattle's contracting strategy. In the recent past, those changes have focused on changes in accepted materials and sharing market risk. Seattle does not plan to develop a city-owned recycling processing facility.

Strategies to reduce contamination fall under collection programs (see section 4.2).

Strategies to minimize processing volumes fall under waste prevention (see Chapter 3, Waste Prevention).

Strategies for market development fall under waste prevention (see Chapter 3, Waste Prevention).

Recommendations:

- Continue with contracting out city-collected recycling. Seattle's strategy to contract out recycling processing for the material gathered by our collection contracts has proved successful. Seattle plans to continue with this strategy. The City of Seattle is contractually bound to do so through 2013.
- Continue allowing open market processing services for material privately collected from commercial sector
- Evaluate optimal contracting approach in anticipation of 2013/2016/2019 contract end
- If future recycling gains lag significantly below expectations, consider testing a "dirty" recycling facility (also called "dirty" Materials Recovery Facility).

Yard and Food Waste Composting

As with recycling processing, any significant alternatives for yard and food waste composting would develop from the contracting process for this service. Seattle does not plan to develop a municipally-owned composting facility.

Promoting backyard composting, however, is still an important strategy for minimizing the need for centralized composting. The convenience of curbside composting service has resulted in some migration of organics from the backyard to the curb. Recession budget cuts forced the City of Seattle to scale back backyard composting promotion. Reinvesting in education could lessen the migration to curbside. See Chapter 3, Waste Prevention, for more detail on backyard composting.

As to capacity, even though SPU has a guaranteed contract for composting services, we support building regional capacity and competition, consistent with the state's *Beyond Waste* goals.

It is also in Seattle's interest to support and promote changes to food packaging and food packaging labeling to minimize non-compostables. These changes would allow compostables and non-compostables to be more easily distinguished from each other. When consumers and

processors are better able to make these distinctions, more material is compostable and contaminants minimized in processing.

Strategies to reduce contamination fall under collection programs (see section 4.2).

Strategies for market development and public agency product procurement fall under waste prevention (see Chapter 3, Waste Prevention).

Recommendations:

- Continue with contracting out city-collected organics processing
- Continue allowing open market processing services for commercial sector
- Support composting capacity development. Pursue a competitive Request for Proposal process for organics processing services to serve Seattle after the current service contract ends in 2013/2014/2015. Continue to encourage backyard organics composting (see Chapter 3, Waste Prevention)
- Support changes to food packaging and labeling in ways that promote composting and reduce contamination
- Enhance contamination outreach and enforcement

Disposal

Disposal alternatives for the planning period are restricted due to Seattle's long-term contract for landfill disposal, which runs to 2028.

In the meantime, alternative disposal technologies continue to evolve. Seattle should stay abreast of those developments. Seriously competitive technologies will require alignment with the city's environmental goals and a thorough life-cycle analysis.

Recommendations:

- Continue contracting for landfill disposal
- Do not pursue or authorize direct combustion of mixed MSW. Do not authorize such facilities
- Monitor and consider emerging conversion technologies
- Evaluate contracting approach and disposal alternatives as 2028 nears

4.5.5 Monitoring and Performance Measurement

All three disposal contracts have clear performance standards and penalties for non-performance. The strategies SPU employs to monitor performance include:

- Public Health - Seattle and King County regulates private processors and alerts SPU to apparent violations as appropriate via regular inspections.
- SPU processing and disposal contract staff regularly monitors contractor reports.

- SPU staff maintains open communication with contractors for identifying problems early and working out solutions.
- Commercial sector recycling rates indicate how well private market is serving this sector.

4.6 SURVEILLANCE & CONTROL (ENFORCEMENT)

In the City of Seattle, facility permitting and compliance (including SPU facilities) are the responsibility of Public Health - Seattle and King County. Illegal waste accumulation issues are addressed in SPU's illegal dumping program. See Chapter 5, Other Seattle Solid Waste Programs, section 5.3 for information on Clean City Programs.

A team of about a dozen SPU solid waste field inspectors supports the implementation and delivery of city-contracted collection services. Field inspectors mainly focus on the residential sector. Their duties include monitoring for compliance with the city's prohibitions against putting recyclable materials in the garbage.

4.7 EMERGENCY MANAGEMENT

Seattle's position as a Pacific Rim center of manufacturing, technology, trade, and tourism make it vulnerable to both natural and human-caused hazards. The city's geography and built environment put it at risk for catastrophic events such as earthquakes, pandemics, and terrorism. Because of these hazards, Seattle must maintain a well-developed integrated emergency management system in which all hazards are considered in a central planning structure. Two specific emergency response plans are relevant to the city's solid waste system:

- Continuity of Operations Plan (SPU)
- Disaster Debris Management Plan (City of Seattle)

4.7.1 SPU Continuity of Operations Plan

The Continuity of Operations Plan (COOP) describes how critical functions, including solid waste, will be maintained in a significant emergency, and establishes timeframes for restoring solid waste services. The COOP outlines steps to maintain SPU's critical services, restore them to pre-established Recovery Time Objectives (RTO), and sustain them for up to 30 days.

The COOP also provides for continuity of management and decision-making if senior and technical personnel are unavailable. The COOP complements the SPU Disaster Readiness and Response Plan (DRRP). The DRRP contains information on how SPU will respond to potential events, crises, or disasters that could involve SPU staff, facilities, or operations. The DRRP addresses response to emergencies and restoring infrastructure and systems, while the COOP ensures continuation of essential SPU functions under a broad range of circumstances.

SPU is currently drafting the COOP, which will be final in 2015.

4.7.2 City of Seattle Disaster Debris Management Plan

The City of Seattle's Disaster Debris Management Plan sets guidelines for debris removal and processing after a debris-generating disaster. The plan was adopted by Council Ordinance 122884 in 2008. SPU recognizes the importance of maintaining public health and safety by planning for efficient removal of debris caused by disasters. The plan describes the city's responsibilities, procedures, and resources available after an emergency or disaster that over-taxes the normal municipal solid waste system. The plan is designed to eliminate threats to life, public health and safety, and ensure social and economic recovery of the affected community.

The Debris Management Plan ensures that SPU and the city can:

- Address debris generated from residential or public properties in a timely manner following a debris-generating event
- Institute a plan to address debris generated on commercial and private property following a significant debris-generating event
- Ensure that vegetative and other recyclable debris and other prohibited materials are diverted from landfilling following a debris-generating event
- Maintain clear and concise documentation of activities eligible for Federal Emergency Management Agency (FEMA) reimbursement under the Public Assistance Grant Program during response and recovery phases

The city will update the plan in 2011 to 2012 to meet FEMA requirements and reflect SPU staffing changes.

The following provides more detail about the disaster plan, including municipal solid waste (MSW) collection, impacts on facilities, and recycling,

Scope of Disaster Debris Management Plan

In activating the Debris Management Plan, SPU will follow two key sections: 1) Concept of Operations and 2) Recovery. The Concept of Operations section lays out the planning and assumptions that would guide debris removal for specific disasters. After Seattle meets life safety needs, removal efforts then occur in the recovery phase of an emergency. Two contracting efforts are underway to support the Disaster Debris Management plan:

- On-call contract for debris hauling and disposal
- On-call contract for debris hauler monitoring and collection of FEMA records

MSW Collection and Emergencies

While increases to MSW may occur after a disaster, SPU will handle that waste through its existing contractors and steps outlined in the COOP. Therefore, it is not necessary for the Debris Management Plan to directly plan for MSW collection.

Current contracts for MSW collection, transfer, and disposal require minimum levels of services despite unplanned events. For example, when Union Pacific shut down its rail lines, Waste Management trucked solid waste containers to Seattle. Although solid waste services may stop during the initial response phase of a major disaster, the city could provide these services,

potentially at a reduced level, during extended response and recovery phases. Seattle will use all available MSW handling resources to provide the maximum achievable level of MSW service during the recovery phase of a major disaster.

During lower impact events, such as a severe wind storm, the city may use normal MSW resources to handle additional materials (vegetative debris) during the recovery period.

Local Solid Waste Facilities Capacity Impacts

Waste management activities also occur in the city other than through Seattle's collection contracts. These activities include private organics and recycling collection in the commercial sector and C&D collection and transfer. Such activities are outside the scope of the disaster debris plan. These materials are, however, transferred or recycled at local transfer and composting facilities. The throughput at these facilities is limited. If a disaster generates additional material through these private systems, the city's ability to use the facilities may be impaired. Therefore, Seattle will rely on temporary debris storage and reduction sites to stage, reduce and haul away debris.

Debris Diversion and Recycling

A secondary goal of the Debris Management Plan is to maximize material recycling or diversion to beneficial use. The disaster plan evaluates options for recycling and beneficial use. Some recycling facility options are Cedar Grove Composting, Renton Concrete, and Seattle Iron and Metal.