#2

CITY OF SEATTLE

RESOLUTION 31426

A RESOLUTION adopting Seattle's Solid Waste Plan 2011 Revision to the 1998 Plan "On the Path to Sustainability," as amended by the 2004 Comprehensive Plan Amendment.

WHEREAS, the City Council adopted Seattle's Comprehensive Solid Waste Management Plan "On the Path to Sustainability" in August 1998, Resolution 29805; and

WHEREAS, the City Council adopted the 2004 Comprehensive Solid Waste Plan Amendment to the 1998 Plan "On the Path to Sustainability" in March 2005, Resolution 30750; and

WHEREAS, Resolution 30990 reaffirmed the goal in the 2004 Comprehensive Solid Waste Plan Amendment to recycle 60 percent of the City's municipal solid waste, and established the year 2012 to achieve the 60 percent goal, and established an additional goal to achieve 70 percent recycling of municipal solid waste by the year 2025; and

WHEREAS, recycling achievement since the adoption of Resolution 30990 has been slower than expected, and analysis done for the 2011 revision showed that 60 percent recycling of municipal solid waste is achievable in the year 2015, and that 70 percent recycling of municipal solid waste is achievable by the year 2022; and

WHEREAS, the State of Washington requires that local governments develop comprehensive solid waste management plans and that they be updated every five years; and

WHEREAS, the Washington State Department of Ecology has determined a Plan Revision is required; and

WHEREAS, Seattle has developed a Plan Revision, which has included opportunities for public input on its crucial program elements; and

WHEREAS, the City's Solid Waste Advisory Committee participated in the development of the Plan Revision; NOW, THEREFORE,

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF SEATTLE, THE MAYOR CONCURRING, THAT:

Section 1. Seattle's Solid Waste Plan 2011 Revision: Picking Up The Pace Toward Zero Waste, attached hereto as Attachment 1, is hereby adopted as the solid waste management plan

CITY CLERK

for the City of Seattle to provide long-term planning direction and guide solid waste program development over the next five years.

Section 2. Goals. The City establishes the following recycling goals recommended in Seattle's Solid Waste Plan 2011 Revision. These goals replace the recycling goals established by Subsection 1.A of Resolution 30990.

A. The City will recycle 60 percent of the municipal solid waste produced within the city by 2015, and 70 percent of the municipal solid waste produced within the city by 2022.

B. The City will recycle 70 percent of the construction and demolition waste produced within the city by the year 2020.

2013 CITY CLERK

Adopted by the City Council the ____ day of _____, 2013, and signed by me in open session in authentication of its adoption this_____ day of _____, 2013.

_____

President _____of the City Council

THE MAYOR CONCURRING:

_____

Michael McGinn, Mayor

Filed by me this ____ day of _____, 2013.

_____

Monica Martinez Simmons, City Clerk

(Seal)

Attachment 1: Seattle's Solid Waste Plan 2011 Revision: Picking Up The Pace Toward Zero Waste

CITY CLERK

Seattle's Solid Waste Plan

Attachment 1

Picking Up the Pace Toward Zero Waste

2011 Plan Revision

Final Draft

July 2012

Seattle Public Utilities

www.seattle.gov/util/SolidWastePlan

THIS CITY CLERK

Attachment 1 to SPU Solid Waste Plan Res.

Acknowledgements

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The Honorable Michael McGinn

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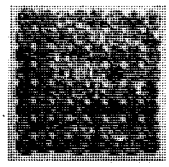
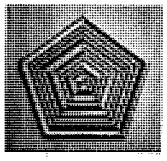
Flathead Grid No. 1, 2007
Newspaper, steel, encaustic, twine
12 x 12 x 4.5 inches



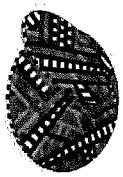
Ross Palmer Beecher
CANDY COBWEB QUILT, 2003
Wire-stitched metal, paint wood, costume jewelry and found object
35 x 35.5 x 3 inches

Evan Blackwell
The Disposable Heroes series, 2005
Various plastics
22 x 10 x 17 inches

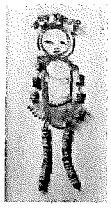


Evan Blackwell
Untitled Eusapia, 2010
Wood window frames
36 x 38 x 2.5 in.

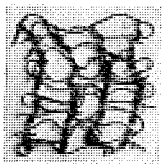
Deborah Faye Lawrence
Tend & Befriend Utopia Tray, 2007
Acrylic, recycled paper collage and varnish on recycled tin TV tray
21.75 x 15.75 inches



Julia Haack
Tracks 2, 2009
Latex paint on salvaged wood 54 x 44 x 3 inches



Marita Dingus
Outdoor baby (hanging), 2010
Pull tabs, champagne wire muselet, electric ceramic tubes, plastic curler attachments, glass
26 x 9 x 3 inches



Marita Dingus
Fence with Rubber, Yellow and Green Plastic and Spools, 2011
Black rubber strips, yellow and green plastic objects, wood beads, buttons, thread spools, plastic dental trays 25 x 23 x 2 inches

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List of Acronyms

ADC	alternative daily cover
BIA	business improvement area
BPA	bisphenol A
C&D	construction and demolition
CESQG	conditionally exempt small quantity generator waste
CFC	chloroflurocarbons
CIP	capital improvement program
COOP	Continuity of Operations Plan
DOC	Department of Corrections
DPD	Department of Planning and Development
DRRP	Disaster Readiness and Response Plan
EJNA	Environmental Justice Network in Action
EJSE	Environmental Justice and Services Equity
EOW	every other week
EPR	Extended Producer Responsibility
EPS	expanded polystyrene (Styrofoam)
FEMA	Federal Emergency Management Agency
FORC	Friends of Recycling and Composting
G&A	General and Administrative
G&E	General Expense
HHW	household hazardous waste
HMA	hot mix asphalt
IPM	integrated pest management
IWS	industrial waste stabilization
LEED	Leadership in Energy and Environmental Design
LFG	landfill gas
LHWMP	Local Hazardous Waste Management Program
MID	Metropolitan Improvement District
MOAs	memoranda of agreement
MRW	moderate risk waste
MSW	municipal solid waste
MTBE	methyl tert-butyl ether
NNYD	Northwest Natural Yard Days
NRDS	North Recycling Disposal Station
NTS	North Transfer Station
NWPSC	Northwest Product Stewardship Council
OCC	old corrugated cardboard
PSI	Product Stewardship Institute
PVC	polyvinyl chloride
RAS	recycled asphalt shingles
RCW	Revised Code of Washington
RPA	Recycling Potential Assessment
RTO	Recovery Time Objectives
SEPA	State Environmental Policy Act
SPU	Seattle Public Utilities
SRDS	South Recycling Disposal Station
STS	South Transfer Station
SWP	Solid Waste Plan
WMI	Waste Management Incorporated

Executive Summary

This Plan revises Seattle's 1998 Solid Waste Management Plan, *On the Path to Sustainability*, as amended in 2004. The overall direction in the plan remains the same. However, this update presents an opportunity to step back and take a deep look at our system and the possibilities for the future.

Properly managed solid waste protects public health and the environment. This Plan describes how Seattle will manage the city's solid waste over the next 20 years. It projects Seattle's needs for solid waste services and facilities. And the plan describes how those needs will be met and paid for. It also serves as a way to communicate planned solid waste strategies to the public and decision-makers. Washington State law requires the Plan.

Organization of this Plan

Readers of the 1998 Plan and 2004 Amendment will notice this Plan is organized somewhat differently. This Plan also goes into more depth on some topics. Seattle Public Utilities (SPU) saw this revision as a chance to create an extended resource document. Not only will it guide the work of the city's solid waste managers, the Plan will be a place to refer questions about Seattle's solid waste system. Seattle is an internationally recognized leader in solid waste management. As such, SPU frequently fields questions from across the nation and other countries.

The Plan is organized into 6 chapters as follows:

- Chapter 1 — Revising the Plan
- Chapter 2 — Seattle Solid Waste Trends
- Chapter 3 — Waste Prevention
- Chapter 4 — Seattle's MSW System: Managing Discards
- Chapter 5 — Other Seattle Solid Waste Programs
- Chapter 6 — Administration and Financing the Plan

These chapters describe in some detail major areas of solid waste management for the City of Seattle and list program recommendations. Chapter 1 briefly explains how this version of the solid waste management plan fits in with the previous plans. Chapter 2 lays out various trends as they have emerged from SPU research into what is new in solid waste generation in Seattle. Chapter 3 discusses waste prevention and its transitioning role in managing discards. Chapter 4 talks about what SPU does with the typical household and business waste that is produced in the

city. Chapter 5 takes on other wastes the SPU system needs to manage. And finally, Chapter 6 discusses the Plan's future and financing.

New in this Plan is a summary matrix for the Plan's many recommendations. The Plan's chapters contain many strategies for reducing waste, for increasing recycling, and for managing the solid waste system. The recommendations matrix should help reviewers more quickly identify and better comment on their areas of concern. Full explanations of recommendations are contained in the relevant chapters. Key recommendations are highlighted throughout the Executive Summary.

The Plan features eight appendices:

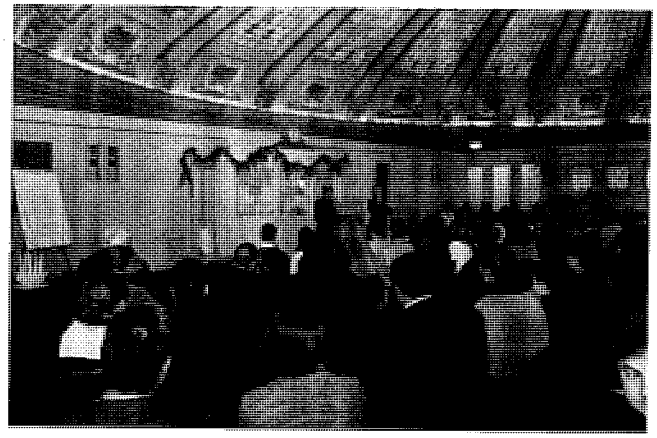
- Glossary
- Zero Waste Resolution
- Public Involvement
- Recycling Potential Assessment (RPA) Model & Environmental Benefits Analysis
- Recycling Business Reporting
- State Environmental Policy Act (SEPA) Documents
- Seattle Solid Waste Advisory Committee (SWAC) Participation
- Resolution for Adoption

The information in these documents supports the Plan and its wide audience. The Plan has many purposes beyond its need to meet regulatory requirements. It must explain to the public how current and future programs work. The Plan aids City of Seattle staff in preparing and running solid waste programs. And it helps decision-makers in the City Council and SPU leadership select among the many options that will pick up the pace toward zero waste.

Revising the Plan

SPU started updating this Plan by reviewing past goals and plans, and taking stock of changes in the rules and regulations that bear on Seattle solid waste planning. To gather a range of public perspectives, we built early stakeholder involvement into our update process.

Various state and local regulations and guidelines influence Seattle's solid waste planning. Chief among the regulations is the State of Washington's 1969 legislation RCW 70.95 requiring local solid waste plans. Local plans project and provide strategies for future solid waste management needs.



Until 1988, the City of Seattle prepared its solid waste plan as part of King County's local plan. In 1989, Seattle began its independent planning for solid waste management with the *Integrated Solid Waste Management Plan.* Ten years later the city prepared the 1998 Solid

Waste Management Plan, *On the Path to Sustainability*, which was updated by the 2004 Plan Amendment.

This 2011 Plan revises the 1998 Plan, capturing the trends in and influences on solid waste management since 2004. Washington State updated its solid waste plan *Beyond Waste* in 2009, and in 2010 published its new *Guidelines for Development of Local Comprehensive Solid Waste Management Plans and Plan Revisions*.

Locally, the Seattle City Council adopted Resolution 30990 (the *Zero Waste* resolution) in 2007. The resolution moved the City of Seattle's 60% recycling goal to 2012 (previously 1998, then 2008 and 2010). It also added actions and strategies for reaching the goal and set a new goal of 70% recycling by 2025.

Even though the planning backdrop has evolved, the basic concepts in Seattle's 1998 Plan prevail. This Plan upholds the 1998 Plan's key concepts of zero waste, waste prevention, sustainability, and product stewardship. The 2004 Amendment updated the 1998 Plan by accenting a streamlined municipal solid waste (MSW) system, food and yard waste (organics) diversion, and product stewardship.

The process to produce this Plan followed the steps of past plans. It involved a wide range of stakeholders, including the Seattle Solid Waste Advisory Committee, citizens, the solid waste industry, other interest groups, and staff from city departments. The Seattle City Council adopts the Plan before the Washington State Department of Ecology (Ecology) reviews and approves it.

The process to maintain the Plan will comply with state regulations. SPU will review the Plan at least as often as required by RCW 90.95, which is currently every 5 years. SPU and Ecology will confer as to whether the 5-year review calls for a Plan amendment or revision.

Further, SPU reviews progress yearly via an Annual Recycling Report. If programs do not perform as expected, we will figure out what the problems are and seek solutions. The desired solutions could potentially lead SPU to pursue a policy change that is significantly different from, or not contemplated in, this Plan. In that case, or because of other update triggers, we will confer with Ecology as to whether the change calls for a Plan amendment or revision.

Seattle Solid Waste Trends

Several major trends have emerged from the analysis for solid waste program planning. Over the next 20 years, Seattle's population will increase, with more growth in multi-family housing than in single-family housing. And employment will shift away from manufacturing to more office-type business, health care, and services.

Seattle's waste generation tends to go up and down with the economy, as it did through the recent recession. Waste volumes will climb back up slowly from pre-recession levels.

Where does SPU get Data?

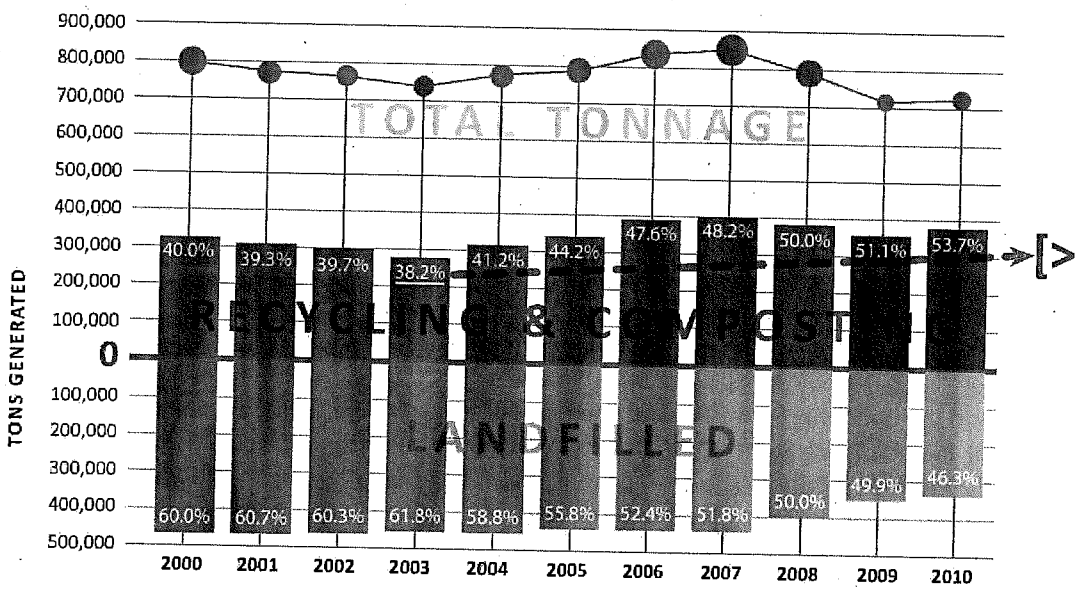
SPU uses a robust array of data and modeling tools to track recycling progress and analyze future programs. Data sources include routine detailed reports from SPU's contracted collectors and processors, and yearly reports from recycling businesses.

To see what people are putting in the garbage, SPU conducts waste composition studies on 4-year cycles by sector.

SPU's Seattle Discards Model analyzes recycling program performance. The Recycling Potential Assessment model analyzes future programs. And we gather waste prevention data on a program-by-program basis.

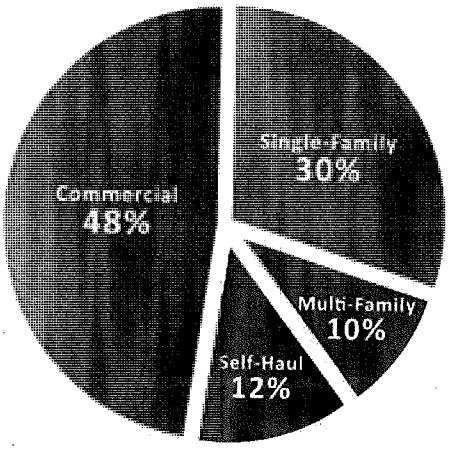
Even with the most recent economic fluctuations, recycling has steadily increased since 2003, reaching 53.7% in 2010, Seattle's highest recycling rate yet.

Seattle's Recycling Rate Continues to Climb



Four municipal solid waste (MSW) sectors contribute to the total waste generated in Seattle. They are the single- and multi-family residential, self-haul, and commercial sectors. In terms of total generated tons, the commercial sector is the largest, followed by the single-family sector.

Seattle MSW Generation by Sector 2010



As of 2010, the single-family sector recycled 70.3% of its waste. The multi-family sector recycled 29.6%, and the self-haul sector recycled 13.7%. The commercial sector recycled 58.9%.

Waste Prevention

SPU's waste prevention programs work to reduce waste volumes from households and businesses. These programs are sometimes referred to as waste reduction or *precycling*. Waste prevention programs also seek to reduce toxics in goods purchased by people, institutions and businesses. SPU's waste prevention programs include product stewardship activities, which seek increased producer responsibility for wastes.

SPU continues to organize waste prevention activities into programs for reuse, onsite organics management, sustainable building, and product stewardship. The 2007 *Zero Waste Resolution* drove several new waste prevention activities, with special focus on product stewardship. Waste prevention initiatives for the future build on existing programs to stretch for more results.

Reuse. Reuse includes programs to increase the amount of reusable goods that stay out of the garbage and go to places that can resell or use them. Reuse also includes developing end-markets for salvaged materials. Recommendations to increase reuse mainly focus on bolstering current programs.

Reuse recommendations include:

- Continuing and enhancing programs at the city's transfer stations to divert more materials before they enter the station, and to direct C&D loads to C&D recycling processors
- Continuing involvement and support for industrial commodities exchange
- Continuing and enhancing programs to divert reusables to charities
- Increasing electronics diversion by adding more products to Washington State's electronic product recycling law, and by promoting private donation of electronic products to places that refurbish them

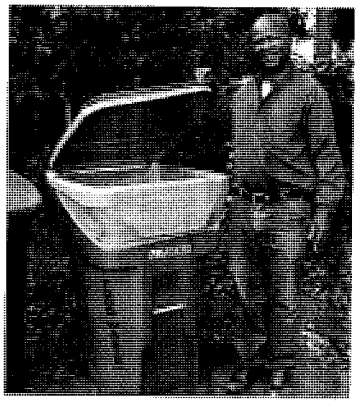
Sustainable Building. Sustainable building programs largely address wastes from construction and demolition (C&D). Supporting Green Building and LEED (Leadership in Environmental Engineering and Design) helps building design meet goals for longevity, reuse, and recycling. Meeting such standards also requires more effort to reduce, reuse, and recycle building materials. SPU collaborates with the City of Seattle Department of Planning and Development (DPD) on sustainable building programs. One program includes changes to building permitting that removes disincentives to deconstruction and salvage and promote reuse and recycling.

Sustainable building recommendations include:

- Continuing to expand C&D prevention and recycling programs. This includes developing grading standards for dimensional lumber and promoting house moving.
- Supporting the initiatives listed under C&D in this Plan

Onsite Organics. Two long-standing SPU programs—backyard composting and grasscycling—have been mainstays in helping customers to manage food and yard waste at home.

In recent years, SPU expanded onsite organics management by working with commercial food vendors. A 2008 law (Ordinance 122751) that requires quick-serve restaurants to use compostable or recyclable packaging reduces food-packaging waste. The law has also led more businesses to request organics pick-up service.



Another short-term SPU program helped large commercial kitchens to reduce food orders by tracking what was really needed.

Also, several commercial food businesses now donate surplus food to hunger-relief agencies. Recommendations to increase organics management carry forward mature programs and support the ramp up of new ones.

Onsite organics recommendations include:

- Continuing to promote backyard composting and grasscycling
- Continuing programs for commercial food businesses to donate edible food to feeding programs. Supporting feeding programs in keeping food fresh and composting leftovers. Helping commercial kitchens find efficiencies
- Focusing community grants on schools to increase food and yard waste collection
- Supporting schools and business to comply with food packaging regulations so that all food serve-ware is recyclable or compostable

Product Stewardship. The City of Seattle supports a product stewardship approach to product end-of-life management through the Northwest Product Stewardship Council (NWPSC). The NWPSC is a coalition of governmental organizations that conducts studies and promotes product stewardship programs and policies. Product stewardship places responsibility and costs on producers and users of various products rather than on solid waste ratepayers.

SPU product stewardship activity ranges from supporting recycling laws (electronics, mercury-containing lighting), to education and take-back programs. SPU has also pursued action on disposable bags and food service ware, and a yellow pages phone book and junk mail opt-out registry. Based on a recent study, SPU has a list of other problem products to pursue for product stewardship as funding allows. Product stewardship recommendations support current approaches and build a framework for future actions.

Product stewardship recommendations emphasize:

- Developing a strategic framework for product stewardship actions
- Continuing to work with the NWPSC to promote product stewardship, and increase the range and effectiveness of product stewardship at the state level
- Continuing to support national dialogues through the Product Stewardship Institute
- Pursuing local regulation for select products when state and regional action is not forthcoming
- Tracking efforts toward product stewardship solutions, for example, producer fees for products commonly found in the city's curbside collection programs

Other Waste Prevention Programs. Other waste prevention programs focus on market development, support for the community, and the City of Seattle's own practices. Market development increases demand for targeted recycled materials such as carpet, plastic film wrap and asphalt shingles. Community matching grants support community-based waste prevention and recycling projects. SPU's Resource Venture, a contracted service, promotes conservation and provides technical assistance to businesses. SPU's new junk mail and yellow pages opt-out program help residents and businesses reduce paper waste.

The City of Seattle Green Purchasing program helps city departments buy products that contain recycled content, are less toxic, are recyclable, and come with minimal packaging. The city's own program to reduce paper use, Paper Cuts, is now ingrained and no longer needs to continue. The recommendations for these other waste prevention programs mainly build on and expand existing programs.

Other waste prevention recommendations include:

- Expanding city green purchasing efforts to city facilities construction and standard specifications for work in the public right-of-way
- Continuing to seek packaging waste reduction and aggressive controls on chemicals
- Continuing the online junk mail and yellow pages phone books opt-out service, and working with phone book businesses to change Washington State regulations that require white pages phone book delivery

Additional recommendations related to waste prevention are in the section on recycling.

Seattle's MSW System: Managing Discards

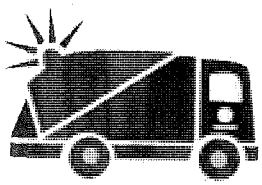
A network of public and private service providers and facilities collect, transfer, process, and landfill the city's discards. At each stage in the municipal solid waste (MSW) system, SPU makes choices about how to handle the materials. Our programs reflect our decisions. Many of this Plan's recycling recommendations will affect collection programs. Transfer functions will improve with the rebuilt stations. SPU will continue to use contracting as its strategy for processing and landfill disposal.

What is MSW?

Municipal Solid Waste, abbreviated as MSW, is solid waste that includes garbage, recycling, and organic material discarded from residential and commercial sources.

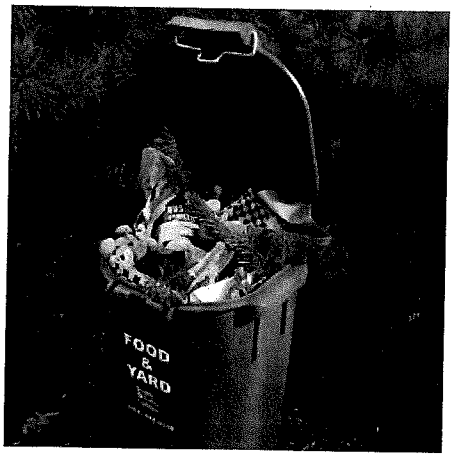
Collection

Collection is the stage in Seattle's MSW system at which SPU can most influence customer decisions and behaviors. New contracts begun in 2009 represent the biggest change in this area since the 2004 Plan amendment. SPU contracted with a new collector and added to the list of accepted recyclables. The single-family sector added weekly organics pick-up, and meat and dairy were added to accepted organics for all customers. Most customers' collection day changed.



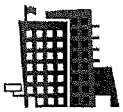
Single-Family Sector Collection. Single-family collection programs pick up garbage, recycling, and food and yard waste (organics). Residences must sign up for garbage and organics service.

Customers automatically sign up for recycling with their garbage service. They may choose from several sizes of cans or carts. Price goes up with can size to encourage waste reduction and recycling. SPU's collection contractors pick up garbage and organics every week, and recycling every other week. SPU also supplies other pick-up services for extra large volumes, and for used motor oil and electronics.



Multi-Family Sector Collection. Multi-family collection services vary according to a building's needs and space constraints. The City of Seattle requires multi-family buildings to subscribe to garbage service. Recycling service is available at no charge to multi-family buildings. Organics service was optional in this sector until September 2011, when it became a requirement. A building's needs determine container size and collection frequency, which determine the monthly fee. Price goes up with container size and collection frequency to encourage recycling.

Self-Haul Sector Collection. Self-haul customers include businesses who haul their own discards, and residential customers who have quantities of materials or materials unsuitable for curb service. The largest portion of self-hauled materials comes from commercial businesses and large institutions. Self-haulers collect their own materials and bring them to the city's two transfer stations. Collection recommendations for this Plan aim either to increase recycling or to address the collection system structure.



Commercial Sector Collection. In the commercial sector, garbage is handled much as it is for residences. City collection contractors pick up from dumpsters of various sizes at least weekly and transfer the garbage at the two Seattle transfer stations. The monthly fee depends on container size and how often the container is picked up. Commercial businesses do not have to subscribe to garbage collection service. They can self-haul to a city or private transfer station.

Commercial recycling service is not required. Paper and cardboard, however, are not allowed in the garbage. For businesses, most recyclables are collected by a wide range of collectors using a variety of container types and sizes. The collectors take the materials to many types of transfer and processing facilities, and brokers.

A small part of this waste stream uses the same cart-based, city-contracted, bi-weekly collection service provided for the city's residential curbside recycling service. The city offers this service at no additional charge. Commercial customers with organics may choose city or private collection service.

Collection-related recycling strategies target a range of actions in different sectors:

- Enhancing and increasing education. Increasing awareness of customer options such as free recycling extras, larger recycling carts.
- Increasing enforcement
- Banning certain materials from disposal in the garbage
- Introducing pet waste and diaper composting

Collection system structure recommendations include:

- Continuing to contract for collection services
- Continuing to monitor collection performance
- Considering changing single-family garbage collection from weekly to every other week after evaluating 2012 pilot project

Many recycling recommendations span the residential, commercial, and self-haul sectors. To avoid repetition, all recycling recommendations are in one list in the following section on recycling.

Recycling

Recycling keeps precious resources out of the landfill by turning them into usable or marketable materials. While Seattle's recycling rates are among the highest in the nation, there's still more that we can do. The assertive recommendations in this Plan will take Seattle to new levels in city recycling.

Recycling isn't a program in itself. Instead, it is a strategy carried out in waste prevention, market development, collection, processing, education, and other programs. Seattle is still working toward the 60% recycling goal set in the prior Plan and in the *Zero Waste* Resolution.

Each sector differs in what remains to be recycled from the garbage, and different factors shape recycling program design.

SPU analyzed several potential new recycling programs. The recommendations that resulted include keeping existing programs, implementing new ones in a phased manner, and adjusting recycling goal years to align with projected achievement of 60% by 2015 and 70% by 2022. Each recommendation targets certain materials in the different sectors. Implementation is phased. Note SPU decided to move up the start year for some of the recommendations than was assumed for the analysis.

Recommended New Recycling Programs

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 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	✓	✓		

✓ Projected implementation

* 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, effective 2012
- Reusable Bag Campaign 2012
- Plastic Bag Ban 2012

Transfer Facilities

Transfer stations compile collected garbage and other materials into larger loads for hauling to their next stop. SPU's transfer stations have outlived their useful lives. We are looking forward to finishing the projects to rebuild them.

The city owns and operates two transfer facilities. The North Recycling and Disposal Station (NRDS) is in the Wallingford neighborhood. The South Recycling and Disposal Station (SRDS) is next to the South Park neighborhood. The two stations receive collector trucks and the materials self-hauled by businesses and residents. Two private transfer stations supplement the capacity of the city stations.

SPU also runs two moderate risk waste (MRW) collection facilities. Seattle provides this service on behalf of the Local Hazardous Waste Management Program (LHWMP). The MRW facility at SRDS serves the city's south end. The other serves the north end at a location near Aurora Avenue and 125th NE.

SPU does not expect to see self-haul recycling rate increases until the city's two transfer stations are rebuilt. We expect to complete the first phase of the south rebuild in 2012. The north facility is scheduled to open in 2014. SPU postponed planning for the former SRDS. However, goals for the property include a separate recycling drop-off area, a reuse area, and a new moderate risk waste drop-off facility.

Meanwhile, smaller projects keep the existing stations safe and reliable.

Transfer facility recycling recommendations, as seen in the recycling recommendations above, include strategies for self-haul that focus on:

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

Other transfer facility recommendations keep current stations running as well as possible, and plan for running and taking advantage of the rebuilt city stations.

Processing and Disposal

Processing and disposal are the end stages of managing the materials in Seattle's MSW system. Seattle contracts with different companies for recycling processing, organics composting, and landfill disposal. This Plan proposes to stay with the contracting approach to end-stage MSW management. Processing and disposal innovations would come through the contracts with private service providers.

Recycling Processing. Rabanco, Ltd, currently holds the contract for recycling processing at their Rabanco Recycling Center and Transfer Station. It is through negotiating the contract that Seattle defines (or "designates") what materials can be collected for recycling. Rabanco facility improvements now allow more types of materials, such as specific plastics, in addition to traditionally recycled materials like paper, bottles, and cans. The last time Seattle added materials to the recyclables list was in 2009, when the new collection contracts started. All recycling collected from the city's residential sector goes to the Rabanco facility.

Recycling from the commercial sector can go to the Rabanco facility. Or if private sector haulers collect it, recycling can go to open market recyclers and traders. Seattle requires private sector recyclers to turn in reports once a year. The reports provide SPU with data on what materials they handled and in what amounts.

Recycling processing recommendations center on contracting, and propose:

- Continuing with contracting out city collected recycling processing
- Continuing to allow open-market processing services for material privately collected from commercial sector
- Evaluating the best contracting approach to prepare for 2013 to 2019 contract end

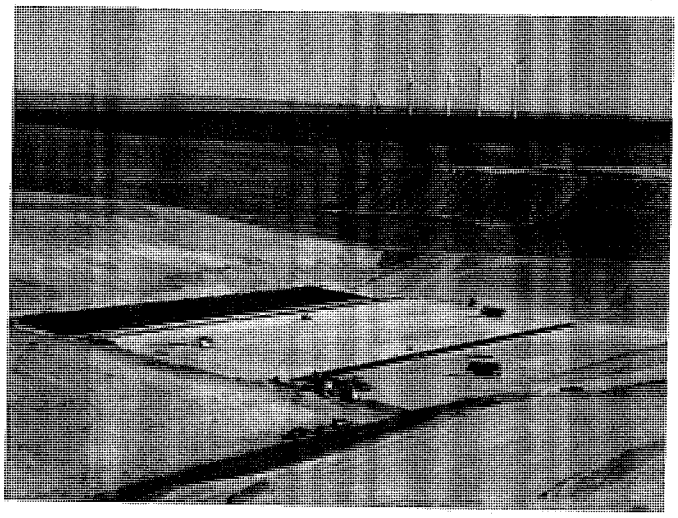
Organics Processing. Organics processing (composting) now includes yard waste, all food waste, compostable (food soiled) paper, and other compostable food packaging. The city has had a contract for processing yard trimmings at Cedar Grove since the facility opened in 1989. Seattle's organics go to the Cedar Grove Maple Valley facility, and organics from north Seattle go to their facility near Everett. As regional demand for composting increases, Cedar Grove and others are developing options to increase capacity.

Organics processing recommendations center on contracting, increasing capacity, and compostable materials, including:

- Continuing with contracting out city-collected organics processing
- Continuing to allow open-market processing services for commercial sector
- Supporting composting capacity development, including possibly anaerobic digestion. Pursuing competitive contract process after current contract ends.
- Continuing to encourage backyard organics composting
- Supporting changes to food packaging and labeling in ways that promote composting and reduce contamination, enhance contamination outreach and enforcement

Landfill Disposal. The city manages landfill disposal through its contract with Waste Management of Washington (Waste Management) for rail haul and disposal of all non-recyclable waste (garbage). The waste goes to their Columbia Ridge Landfill in Gilliam County, Oregon. This contractual arrangement has been in place since 1990. The current contract expires in 2028.

Projections for Columbia Ridge and other regional landfills indicate ample capacity for decades. Any significant changes to processing and disposal would be built into contracts for those services.



Landfill disposal recommendations center on the contracting approach:

- Continue with 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

Emergency Management

Seattle's geography and built environment put it at risk for catastrophic events such as earthquakes, pandemics, and terrorism. Two specific emergency response plans apply to the city's solid waste system.

Disaster Debris Management Plan. The city's Disaster Debris Management Plan sets guidelines for removing and processing debris after a disaster that creates large volumes of waste.

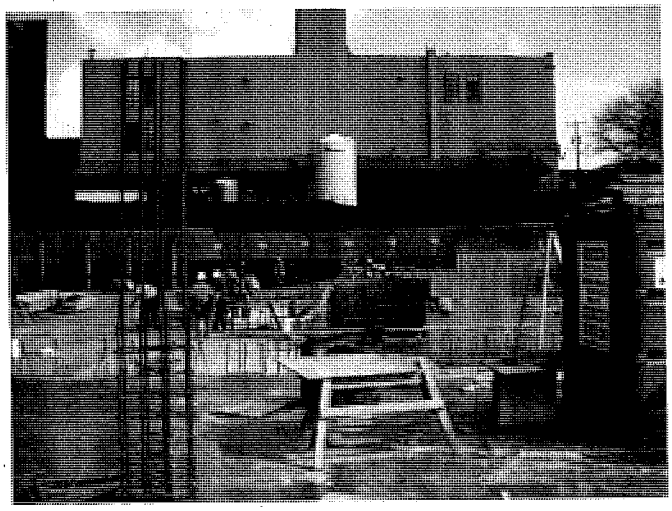
Continuity of Operations Plan. SPU's Continuity of Operations Plan (COOP) describes how critical functions, including solid waste, will be maintained in case of a serious emergency. It also sets timeframes for restoring solid waste services. SPU will finish drafting the COOP in 2015.

Other Wastes

In addition to the municipal solid waste (MSW) system, Seattle manages other programs for wastes outside the MSW system. For the first time, Seattle's Plan includes program proposals for construction and demolition (C&D) debris. The historic landfills, Clean City, and special waste programs continue their vital services and do not propose major changes. Moderate risk waste management will continue to operate under the Local Hazardous Waste Management Program.

Construction and Demolition (C&D) Debris

The largest waste stream outside the MSW system is C&D. The city's prior solid waste plans included neither specific goals nor objectives for C&D. Work over the past few years now positions SPU to propose C&D programs and the first-ever C&D recycling goal.



SPU currently contracts with Waste Management for C&D collection. C&D generators may use this service or they may self-haul. The C&D goes to a mix of private and public transfer and processing facilities both inside and outside of Seattle. C&D waste generation is considerably more variable compared with MSW because it is highly sensitive to economic upswings and downturns.

In the years since the 2004 Amendment, SPU conducted studies and developed ways to measure C&D. At this point, we can now propose programs and set goals for this waste stream. The *Zero Waste* Resolution directed these and other actions.

Planning for C&D overlaps somewhat with MSW. This is because some C&D-type materials enter the MSW system, mostly at the city's transfer stations from self-haulers. This Plan's MSW recycling recommendations address the small portion of C&D that ends up in the MSW. Also, waste prevention sustainable building programs support C&D reduction in both the C&D and MSW sectors.

SPU worked with industry stakeholders in developing C&D recycling options for this Plan update. SPU's analysis showed that current programs would maintain the current C&D recycling rate, which was 61.4% in 2010. If all recommendations are implemented, the C&D recycling rate should reach 70% by 2020.

C&D recommendations set goals, target certain materials, set facility standards, and modify permit requirements, including

- Creating city-wide C&D recycling goal of 70% by 2020
- Developing, with private processors, an advanced level facility certification process
- Banning metal, cardboard, plastic film wrap, carpet, and scrap gypsum (new construction) by 2013. Banning clean wood and tear-off asphalt shingles by 2014.
- Requiring recycling reports from contractors as a term of their Final Permit.
- Continuing and building on existing programs for LEED and Built Green, salvage, and hybrid deconstruction, coordinating with waste prevention activities

The materials bans will be phased in. All bans will begin with a period of education.

Historic Landfills

The historic landfills program tends to the old in-city and city-owned landfills that took Seattle's garbage before 1987. Until the 1960s, Seattle disposed of its garbage in landfills within the city limits. Between 1966 and 1986, the City of Seattle operated two major landfills south of Seattle: Midway Landfill and Kent Highlands Landfill.

No major new initiatives are being considered for Seattle's historic landfills. Instead, it's more a matter of staying the course on the decisions and investments that have already been made.

Historic Landfills--for the planning period SPU will

- Continue to monitor and maintain Kent Highlands and Midway in accordance with regulatory requirements and to the satisfaction of adjacent communities
- Reduce monitoring requirements as appropriate, with regulatory concurrence
- Continue to monitor and control landfill gas at Interbay and Genessee sites
- Respond to problems at historic in-city landfills on a case-by-case basis
- Pursue possible site de-listing and future beneficial use of the Kent Highlands and Midway landfill sites

Clean City Programs

Clean City programs are an extension of traditional City of Seattle solid waste services that help keep streets and neighborhoods clean and healthy. Clean City programs abate graffiti, illegal dumping, and litter. The city funds Clean City separately from solid waste programs.

Anti-Graffiti Program. The anti-graffiti program removes or paints out graffiti on public property. SPU, other city departments, other agencies, and the public are all vital for making this program successful.

SPU runs a reporting hotline, abates graffiti on certain structures, performs enforcement, and engages the public's support. Anti-graffiti recommendations will make program operations more effective and respond to evolving needs.

Anti-graffiti recommendations include plans to:

- Implement the 2009 to 2010 private property task force's recommendations
- Encourage reporting, translation of outreach materials, and development of strategic partnerships to leverage resources
- Amend the Seattle Municipal Code (SMC 12.A-08-020) to include stickers in the list of prohibited materials
- Redeploy abatement resources across city departments to better address graffiti abatement on parking pay stations
- Enhance community involvement and public education. Develop a customer satisfaction measurement tool
- In the long-term, increase program emphasis on prevention, apprehension and prosecution, and interdepartmental and inter-agency collaboration

Illegal Dumping Program. The illegal dumping program addresses illegally dumped materials on public property. SPU program staff inspect the dumping sites. Washington State Department of Corrections (DOC) crews clean up the materials as needed. Illegal dumping recommendations will improve performance.

Illegal dumping recommendations include plans to:

- Improve enforcement protocol
- Provide additional staff training
- Expand use of existing database

Litter Programs. SPU provides several programs designed to reduce litter. **Adopt-a-Street** offers tools for volunteers to collect litter. **Street Side Litter** places collection cans along city streets in business areas. **Public Place Recycling** pairs recycling with litter cans. **Litter Collection in Parks** places collection cans in city parks. Washington State's secured load requirement reduces litter and road debris.

Litter program recommendations include a key item to address Metro bus zones. Many bus shelters are shifting to canopies attached to privately-owned buildings. Clear roles, responsibilities and design standards will ensure these shelters receive proper litter services.

Moderate Risk Waste

The Local Hazardous Waste Management Program (LHWMP) manages moderate risk waste in Seattle and other areas of King County. Moderate risk waste (MRW) is hazardous waste generated by residents and in small quantities by businesses and institutions. This includes two categories of waste:

1. *Household hazardous waste* (HHW), which is generated by residents, and
2. *Conditionally exempt small quantity generator waste* (CESQG), which is generated in small quantities by businesses, schools, and other institutions.

Four local government bodies jointly manage the LHWMP: SPU, King County, Public Health - Seattle & King County, and the county's suburban cities. To address changes that have occurred within King County, the LHWMP has committed to:

- Providing the maximum possible number of service hours at Seattle's MRW (HHW) collection facilities
- Collecting CESQGs on and on-going basis
- Expanding outreach for hazardous materials collection services, and providing outreach to the elderly, homebound, non-English speaking population, and historically underserved communities
- Working to secure state product stewardship legislation for unwanted medicines, mercury-containing lighting, and paint

Special Wastes

Like moderate risk waste, special wastes can't go in the regular municipal solid waste (MSW) system. But they aren't hazardous enough to qualify as "Dangerous" as defined by state and federal law.

These wastes require special handling and disposal because of regulatory requirements or other reasons. Toxicity, volumes, or particular handling issues are some of those reasons. In some cases, special wastes can be landfilled if properly managed. In order to ensure proper management, SPU will:

- Continue to maintain up-to-date referral information for special wastes
- Continue programs to create better end-of-life solutions for problem materials, such as state-level product stewardship laws for fluorescent lighting and consumer electronics

Administration and Financing

SPU fully expects to maintain the ability to carry out the Plan: SPU's organization and financial health are stable. Carrying out the plan will also require robust education efforts. Since monthly solid waste customer rates will rise with or without the new programs, education will be vital. Customers will need to know how to work with the new programs to keep their personal costs as low as possible.

Organization and Mission of Seattle Public Utilities

Solid waste functions are spread throughout SPU. As a department within the City of Seattle, SPU houses three direct-service utilities. They are the Water, Drainage and Wastewater, and Solid Waste utilities. Our organizational structure consists of seven branches. The Utility Systems Management branch is the main planning arm for SPU. The other branches either implement solid waste programs or provide indirect support such as finance and human resources. SPU strives to deliver reliable, efficient, and environmentally responsible services.

Education

SPU places a high priority on educating customers about recycling and waste reduction. Educating our customers about the impacts of their behavior--and highlighting the programs available to them--has helped develop the city's identity as one of the greenest in the nation.

SPU's many solid waste education efforts are built into customer service and overall communications. We use newsletters and calendars, the web, the inspection team, transfer station staff, and other means to inform customers. Commercial customers receive billing and service information through their private collection services. The Resource Venture and SPU's key accounts team also help educate commercial customers.

SPU's educational programs have been highly effective. The Washington State Recycling Association recognized the City of Seattle with a Recycler of the Year Award for the Better Recycling Starts March 30 Campaign. This campaign eased the 2009 transition to new collection contracts. Recycling recommendations in this Plan include plans to enhance education.

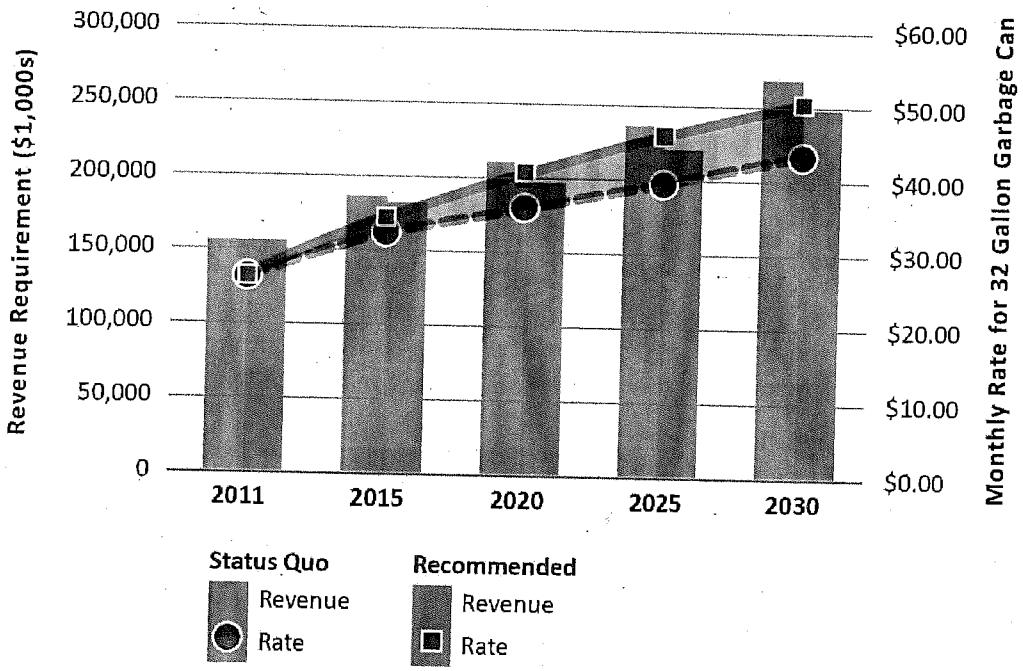
Financing

SPU's financial analysis on the package of recommendations in this Plan revealed three important effects.

First, overall system costs will be less with the recommendations in this Plan than they would be by continuing the current programs (status quo). Thus, the revenue needed to operate the solid waste program will be less than if we did not change the status quo.

As shown in the following chart, with the recommended programs revenue needed in 2030 drops from about 270 million to 249 million. Solid waste system costs decrease because the recommended programs reduce garbage tons moving through the system. And waste reduction and recycling cost less than putting garbage in the landfill. Although the new programs have implementation costs, savings from reducing garbage more than offset the costs of the new programs.

Revenue Needs will Rise More Slowly and Monthly Rates will Rise More Steeply with Recommended Programs

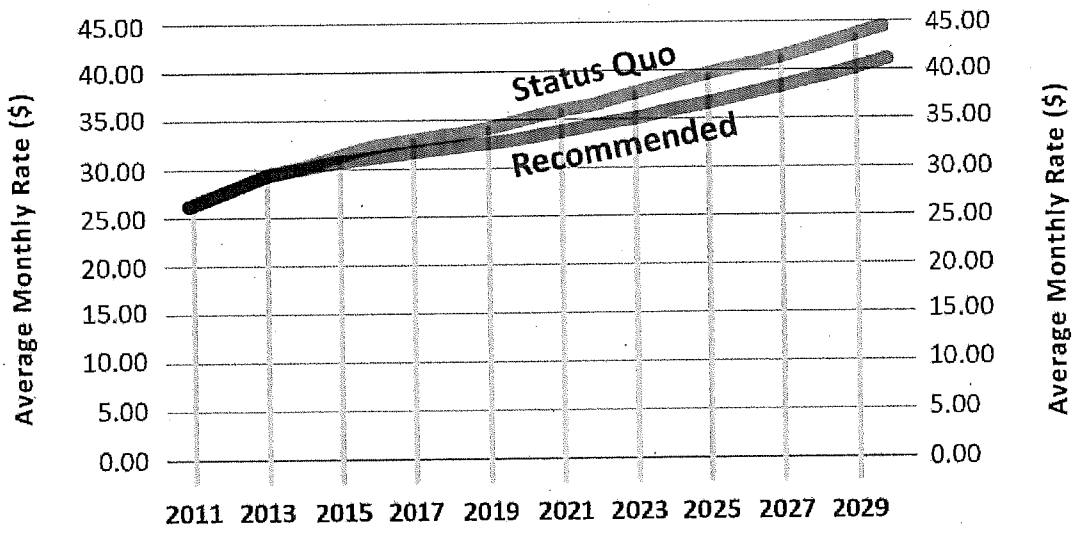


Secondly, the monthly rate (fee) per can will rise higher than if SPU does not change programs as shown by the green shaded area in the chart above. For example, by the year 2030 with the recommended programs the monthly can rate will be about $50 as compared with $44 under the status quo. As customers decrease their amount of garbage, they reduce the size, number

or frequency of containers they need. In turn, this reduces the number of service units from which SPU can collect rates. Thus, the rate per unit rises. Under the status quo, rates will rise to cover inflation and any new capital investments.

The third effect is the most important to the customer. Most customers will pay less for their monthly service than if SPU does not change programs, even though the per-can rate will rise. Customers tend to switch to a smaller garbage can size and less frequent pick-up as they reduce waste and recycle more. The following figure illustrates this effect. In the year 2030, average customer monthly payments will be almost $8 a month lower than if programs didn't change. However, rates will be sensitive to actual customer demand.

Average Customer Costs will Rise More Slowly



System costs are comprised of operations and maintenance (O&M) and capital costs. About 60% of annual O&M costs come from SPU contracts for collection, processing, and disposal. The remainder comes from running the city's two transfer stations and other SPU solid waste functions. Annual ratepayer revenue pays for most O&M costs. This revenue comes from monthly rates, or fees, that our customers pay for their collection service.

Solid waste financing also needs to cover capital investments. SPU will rely heavily on borrowing over the next few years. We are in a period of large capital improvements. Projects are underway to upgrade both of the city's recycling and disposal stations. SPU is also a party to the cleanup of the old landfill in the South Park Development project. To finance capital spending, SPU relies primarily on borrowing and to a lesser extent on rate revenues.

All SPU's spending and rate decisions go through an exacting decision process and comply with well-developed financial policies. The Mayor and City Council approve all program and financial decisions.

For in-depth information on any topic in the Executive Summary, refer to the relevant chapter in the Plan.

Seattle Solid Waste Management Plan Recommendations Summary

These are summaries of the recommendations from City of Seattle's 2011 Solid Waste Plan (SWP). The reference number is for feedback to Seattle Public Utilities.

**Indicates where to find additional information about the recommendations in the SWP*

Strategy	Program	Ref No	Recommendation	2010 SWP Section*
Recycling	MSW	R1	Continue to operate current programs as a base for future new recycling programs	MSW Recycling Recommendations 4.3 Collection 4.2* Transfer 4.4*
	MSW	R2	Continue to require quick-serve restaurants, food courts and institutional food services to use recyclable or compostable single-use food service products	MSW Recycling Recommendations 4.3
	MSW	R3	Implement universal multi-family organics service in 2012 (Actual start Sep 2011)	MSW Recycling Recommendations 4.3 Collection 4.2*
	MSW	R4	Increase enforcement of residential bans in 2012	MSW Recycling Recommendations 4.3 Collection 4.2*
	MSW	R5	Implement carpet take-back program in 2012	MSW Recycling Recommendations 4.3 Waste Prevention 3.0*
	MSW	R6	Increase enforcement of commercial paper ban in 2012	MSW Recycling Recommendations 4.3 Collection 4.2*
	MSW	R7	Implement junk mail and yellow pages phone books opt-out – (Implementation accelerated to 2011)	MSW Recycling Recommendations 4.3 Waste Prevention 3.4*
	MSW	R8	Implement ban on landfill disposal of asphalt paving, concrete and bricks in 2013. At city transfer stations and in commercial garbage containers. (Legislation adopted 2011)	MSW Recycling Recommendations 4.3 Collection 4.2* Transfer 4.3*
	MSW	R9	Implement transfer station floor sorting program for C&D loads that appear at least 50% C&D material in 2013	MSW Recycling Recommendations 4.3 Transfer 4.3*
	MSW	R10	Enhance commercial organics outreach in 2013	MSW Recycling Recommendations 4.3 Collection 4.2*
	MSW	R11	New education programs in 2013: To small business about free recycle carts and audits of top self-haulers.	MSW Recycling Recommendations 4.3 Collection 4.2* Transfer 4.3*
	MSW	R12	Restore education funding for all sectors in 2013 to pre-recession levels	MSW Recycling Recommendations 4.3 Collection 4.2* Transfer 4.4*
	MSW	R13	Add food waste and compostable paper to single-family organics I disposal ban in 2014.	MSW Recycling Recommendations 4.3 Collection 4.2*
	MSW	R14	Launch a reusable bag campaign in 2014 (Implementation accelerated to 2012)	MSW Recycling Recommendations 4.3 Waste Prevention 3.0*
	MSW	R15	Implement an asphalt roofing shingles landfill disposal ban 2014. At city transfer stations.	MSW Recycling Recommendations 4.3 Transfer 4.4* C&D 5.1*
	MSW	R16	Extend the commercial landfill disposal ban to include additional materials 2014	MSW Recycling Recommendations 4.3 Collection 4.2*
	MSW	R17	Implement a clean wood landfill disposal ban 2014. At city transfer stations and in commercial garbage containers.	MSW Recycling Recommendations 4.3 Collection 4.2* Transfer 4.4* C&D 5.1*

Strategy	Program	Ref No	Recommendation	2010 SWP Section*
Recycling	MSW	R18	Implement a plastic film landfill disposal ban 2014. At city transfer stations and in commercial garbage containers.	MSW Recycling Recommendations 4.3 Collection 4.2* C&D 5.1*
	MSW	R19	Implement multi-family organics (food and compostable paper) landfill disposal ban 2015	MSW Recycling Recommendations 4.3 Collection 4.2*
	MSW	R20	Implement a plastic bag ban (from stores) in 2015 (accelerated to 2012)	MSW Recycling Recommendations 4.3 Collection 4.2*
	MSW	R21	Implement a product stewardship program for architectural paint in 2015	MSW Recycling Recommendations 4.3 Waste Prevention 3.0*
	MSW	R22	Enhance diversion of reusables from self-haul loads in 2015	MSW Recycling Recommendations 4.3 Transfer 4.4* Waste Prevention 3.4*
	MSW	R23	Launch market development for textiles in 2016	MSW Recycling Recommendations 4.3 Waste Prevention 3.0*
	MSW	R24	Implement commercial organics (food and compostable paper) landfill disposal ban in 2016	MSW Recycling Recommendations 4.3
	MSW	R25	Implement pre-scale recycling at the rebuilt transfer stations in 2016	MSW Recycling Recommendations 4.3 Transfer 4.4*
	MSW	R26	Implement a commercial landfill disposal ban on C&D materials 2017. In commercial garbage containers.	MSW Recycling Recommendations 4.3 Collection 4.2* CC&D 5.1*
	MSW	R27	Implement pet waste and diaper composting program in 2020	MSW Recycling Recommendations 4.3 Collection 4.2*
	MSW	R28	Revise the City's recycling goals to 60% by 2015 and 70% by 2022	MSW Recycling Recommendations 4.3
	MSW	R29	Consider changing single-family garbage collection to every other week after evaluating 2012 pilot project	Collection 4.2 MSW Recycling 4.3*
	C&D	CD1	Set the C&D recycling rate goal to 70% by 2020.	C&D 5.1
	C&D	CD2	Continue current programs linked to Waste Prevention: LEED and Built Green; voluntary salvation assessment promotion; change definitions for waste diversion credits	C&D 5.1 Waste Prevention 3.0*
	C&D	CD3	Develop training programs for hybrid deconstruction techniques for residential and small commercial structures	C&D 5.1 Waste Prevention 3.0*
	C&D	CD4	Develop and widely promote a certification program for C&D processing facilities in coordination with the local industry and other solid waste planning jurisdictions	C&D 5.1
	C&D	CD5	Implement a disposal ban for asphalt, bricks and concrete paving 2012. At construction jobsites and private transfer stations.	C&D 5.1 MSW Recycling Recommendations 4.3*
	C&D	CD6	Implement landfill disposal bans for certain materials by 2013, at construction jobsites and private transfer stations: metal, and cardboard, plastic film wrap, carpet, scrap gypsum from new construction	C&D 5.1
	C&D	CD7	Implement landfill disposal ban for certain materials in 2014, at construction jobsites and private transfer stations: clean wood, tear-off asphalt shingles	C&D R5.1 MSW Recycling Recommendations 4.3*

Strategy	Program	Ref No	Recommendation	2010 SWP Section*
System & Facilities	Collection	C1	Continue the current practice of contracting for collection services to encourage competition and achieve the best prices for SPU ratepayers	Collection 4.2
	Collection	C2	Continue monitoring contractor performance to ensure contractors meet obligations and customers receive promised service	Collection 4.2
	Transfer Facilities	TF1	Continue to maintain all structures, systems and equipment to keep existing transfer stations safe and functional as long as they are being used	Transfer 4.4
	Transfer Facilities	TF2	Ensure interim major equipment purchases compatible with new transfer facilities	Transfer 4.4
	Transfer Facilities	TF3	Seek opportunities to make services equitable for all Seattle populations, particularly the historically under-served	Transfer 4.4
	Transfer Facilities	TF4	Continue trip reduction strategies	Transfer 4.4
	Transfer Facilities	TF5	Implement Alaskan Way Viaduct Contingency Plan for managing materials from the city's north transfer facility during viaduct closure	Transfer 4.4
	Transfer Facilities	TF6	Rebuild the north and south transfer stations	Transfer 4.4
	Transfer Facilities	TF7	Continue planning for staffing and equipment transition to the new transfer facilities	Transfer 4.4
	Transfer Facilities	TF8	Renew redevelopment planning of the existing SRDS when resources are available and decisions on the north site are made	Transfer 4.4
	Processing and Disposal	PD1	Continue to contract for processing of recyclable materials collected by SPU contracts	Recycling Processing 4.5
	Processing and Disposal	PD2	Continue to allow open market processing for recyclable materials privately collected from the commercial sector	Recycling Processing 4.5
	Processing and Disposal	PD3	Evaluate optimal contracting approach in anticipation of 2013/2016/2019 contract end	Recycling Processing 4.5
	Processing and Disposal	PD4	If recycling gains lag, consider testing "dirty" materials recycling facility (MRF)	Recycling Processing 4.5
	Processing and Disposal	PD5	Continue to contract for processing of organic materials collected by SPU contracts	Yard and Food Waste Composting 4.5
	Processing and Disposal	PD6	Continue to allow open market processing services for organic materials collected from the commercial sector	Yard and Food Waste Composting 4.5
	Processing and Disposal	PD7	Support composting capacity development. Pursue competitive process after current contract ends 2013/2014/2015.	Yard and Food Waste Composting 4.5
	Processing and Disposal	PD8	Support changes to food packaging and labeling in ways that promote composting and reduce contamination	Yard and Food Waste Composting 4.5 Waste Prevention 3.0*
	Processing and Disposal	PD9	Continue to contract for landfill disposal	Disposal 4.5

Strategy	Program	Ref No	Recommendation	2010 SWP Section*
System & Facilities	Processing and Disposal	PD10	Do not pursue or authorize direct combustion of mixed solid waste. Do not authorize such facilities.	Disposal 4.5
	Processing and Disposal	PD11	Monitor and consider emerging technologies	Disposal 4.5
	Processing and Disposal	PD12	Evaluate contracting approach and disposal alternatives as the long-term disposal contract comes to an end in 2028	Disposal 4.5
	Historic Landfills	HL1	Continue to monitor and maintain Kent Highlands and Midway in accordance with regulatory requirements and to the satisfaction of adjacent communities	Historic Landfills 5.2
	Historic Landfills	HL2	Reduce monitoring requirements as appropriate, with regulatory concurrence	Historic Landfills 5.2
	Historic Landfills	HL3	Continue to monitor and control landfill gas at Interbay and Gennessee	Historic Landfills 5.2
	Historic Landfills	HL4	Respond to problems at historic in-city landfills on a case-by-case basis	Historic Landfills 5.2
	Historic Landfills	HL5	Pursue possible site de-listing and future beneficial use of the Kent Highlands and Midway landfill sites	Historic Landfills 5.2
Clean City	Graffiti	CC1	Implement the 2009 – 2010 private property anit-graffiti task force's recommendations	Anti-Graffiti 5.3
	Graffiti	CC2	Anti-graffiti: amend the Seattle Municipal Code (SMC 12.A.08.020) to include stickers in the list of prohibited materials	Anti-Graffiti 5.3
	Graffiti	CC3	Redeploy abatement resources across City departments to better address graffiti abatement on multi-space parking pay stations	Anti-Graffiti 5.3
	Graffiti	CC4	Enhance community involvement and public education activities: develop community outreach and engagement plan; convene anti-graffiti outreach coalition	Anti-Graffiti 5.3
	Graffiti	CC5	Develop and launch a tool to determine customer satisfaction with SPU's anti-graffiti services	Anti-Graffiti 5.3
	Graffiti	CC6	Long-term, increase emphasis on prevention, apprehension and prosecution and interdepartmental/inter-agency collaboration	Anti-Graffiti 5.3
	Illegal Dumping	CC7	Further develop enforcement protocol and enhance staff training for safe and effective enforcement	Illegal Dumping 5.3
	Illegal Dumping	CC8	Long-term, increase emphasis on enforcement	Illegal Dumping 5.3
	Litter	CC9	Develop formalized roles, responsibilities and design standards for bus zone transition projects	Litter 5.3
Moderate Risk Waste	Moderate Risk Waste	MRW1	Maximize service hours at Seattle's collection facilities as much as possible	Moderate Risk Waste 5.4
	Moderate Risk Waste	MRW2	Continue collecting CESQG collection	Moderate Risk Waste 5.4
	Moderate Risk Waste	MRW3	Expand outreach for hazardous materials collection services ;targeted outreach to the elderly, homebound, non-English speaking population and historically underserved communities	Moderate Risk Waste 5.4

Strategy	Program	Ref No	Recommendation	2010 SWP Section*
MRW	Moderate Risk Waste	MRW4	Work to secure state product stewardship legislation for unwanted medicines, mercury containing lighting and paint	Moderate Risk Waste 5.4 Waste Prevention 3.4*
Special Wastes	Special Wastes	SW1	Continue to maintain up-to-date referral information for special wastes	Special Wastes 5.6
Waste Prevention	Reuse	WP1	Continue existing transfer station reuse programs until new facilities done: contractor diversion, charity drop boxes. Reprogram as needed for new facilities	Waste Prevention 3.4 Transfer Facilities 4.4*
	Reuse	WP2	Develop educational materials to direct contractors to source-separated drop-off services or C&D mixed load processors in lieu of SPU's transfer stations	Waste Prevention 3.4 Transfer Facilities 4.4* C&D 5.1*
	Reuse	WP3	Collaborate with charities and others to continue to finds ways to divert usable items and materials	Waste Prevention 3.4
	Reuse	WP4	Continue to support City policies requiring donation of usable electronic equipment to schools	Waste Prevention 3.4
	Reuse	WP5	Promote private donation of electronic products to organizations that refurbish them for reuse	Waste Prevention 3.4
	Reuse	WP6	Continue involvement and support for industrial commodity exchange programs, focusing on market development for recycled commodities as needed	Waste Prevention 3.4
	Reuse	WP7	Work with the NWPSC to expand Washington State's Electronic Product Recycling Law to include additional types of electronic products	Waste Prevention 3.4
	Reuse	WP8	Continue to ensure electronics disposal meets or exceeds Basel Action Network (BAN) Electronic Recycler's Pledge of True Stewardship, Ecology's Environmentally Sound Management and performance Standards for Direct Processors, and upgraded BAN e-Stewards standards as may be adopted by the Seattle City Council	Waste Prevention 3.4
	Reuse	WP9	When renewing in 2014, upgrade electronics disposal standards in Seattle's surplus electronics contract to the new BAN e-Stewards standards	Waste Prevention 3.4
	Sustainable Building	WP10	Continue support for current C&D prevention and recycling programs: changes in City of Seattle building codes that provide incentives for salvage and deconstruction; U.S. Green Building Council (LEED); collaboration with Department of Planning and Development	Waste Prevention 3.4 C&D 5.1*
	Sustainable Building	WP11	Support new and expanded C&D prevention and recycling initiatives: grading standards for salvaged structural (dimension) lumber to expand the market; house moving promotion	Waste Prevention 3.4 C&D 5.1* Transfer Facilities 4.4*
	Organics Onsite	WP12	Continue to promote home onsite organics management: backyard composting of food scraps and landscape waste; grasscycling	Waste Prevention 3.4
	Organics Onsite	WP13	Continue programs for commercial onsite organics management, promote restaurant and retail donations to food banks and feeding programs, work with food banks to minimize their disposal costs by diverting more food waste to composting, promoting food purchasing and preparation efficiency as a complement to programs designed to increase commercial food waste composting	Waste Prevention 3.4

Strategy	Program	Ref No	Recommendation	2010 SWP Section*
Waste Prevention	Organics Onsite	WP14	Offer consulting services to help restaurants and institutional kitchens buy and serve food with less waste, if funds available	Waste Prevention 3.4
	Organics Other	WP15	For the near term, focus grant monies on schools to establish system wide approaches to school food and yard waste collection	Waste Prevention 3.4
	Organics Other	WP16	Continue to press the quick-serve restaurant industry, food courts and institutional food service businesses to use primarily compostable single-use food service products	Waste Prevention 3.4
	Organics Other	WP17	Move forward with efforts that support food packaging regulation and food waste composting: proper containers are used in public areas of quick-serve restaurants and other food service businesses; food service businesses have collection contracts so materials are sent to proper processing; extensive public education to support food packaging programs	Waste Prevention 3.4
	Product Stew-ardship	WP18	Develop a strategic framework for product stewardship actions, including assessment of products and materials that can be regulated locally or at the state level	Waste Prevention 3.4
	Product Stew-ardship	WP19	Continue work with NWPSC, LHWMP and others to increase the range and effectiveness of product stewardship at the state level	Waste Prevention 3.4
	Product Stew-ardship	WP20	Continue support for proposed state legislation regarding return of unwanted, leftover pharmaceuticals, medical sharps and carpet	Waste Prevention 3.4
	Product Stew-ardship	WP21	Monitor and support the development of plans for producer-paid end-of-life management for mercury-containing lighting products resulting from 2010 state legislation	Waste Prevention 3.4
	Product Stew-ardship	WP22	Work with partners to determine the best strategies and timing for new state legislation covering products such as latex and oil-based paint	Waste Prevention 3.4
	Product Stew-ardship	WP23	Support the NWPSC dialog regarding product stewardship for packaging and printed paper	Waste Prevention 3.4
	Product Stew-ardship	WP24	Continue support for the Product Stewardship Institute and the national product dialogs the institute supports	Waste Prevention 3.4
	Product Stew-ardship	WP25	Pursue local legislation for select products, which may include take-back, where state or regional action is not forthcoming	Waste Prevention 3.4
	Product Stew-ardship	WP26	Track efforts toward product stewardship solutions for products and materials included in the City's curbside collection program	Waste Prevention 3.4
	Product Stew-ardship	WP27	Monitor product stewardship programs' material reuse and recovery rates; evaluate future support compared to curbside, other existing programs	Waste Prevention 3.4
	Product Stew-ardship	WP28	Emphasize job creational potential of product stewardship programs	Waste Prevention 3.4
	Other WP	WP29	Push city departments toward additional green purchasing decisions in facilities construction	Waste Prevention 3.4

Strategy	Program	Ref No	Recommendation	2010 SWP Section*
Waste Prevention	Other WP	WP30	Work for guidelines requiring more recycling and recycled-content in "standard" specifications for work in the public right-of-way	Waste Prevention 3.4
	Other WP	WP31	Seek packaging waste reduction and more controls on chemicals purchasing to reduce toxics exposures for staff and other city facility users	Waste Prevention 3.4
	Other WP	WP32	Contribute to standards setting for "ecolabels" and suppliers – from green office supplies to green fleets	Waste Prevention 3.4
	Other WP	WP33	Incorporate end-of-life management and product stewardship into purchasing	Waste Prevention 3.4
	Other WP	WP34	City continues its role as a resource for businesses that are utility customers and other government agencies	Waste Prevention 3.4
	Other WP	WP35	Continue to include PaperCuts as a part of outreach to businesses whenever possible	Waste Prevention 3.4
	Other WP	WP36	Continue community grants, with near-term focus on schools organics reduction	
	Other WP	WP37	Continue to use and monitor the online junk and catalog opt-out service establish in 2011	Waste Prevention 3.4
	Other WP	WP38	Given a favorable decision in the yellow pages publishers' lawsuit seeking to block the Phone Books Opt-Out Registry, strongly promote the opt-out service to reduce paper use	Waste Prevention 3.4
	Other WP	WP39	Work with phone book companies and publishers to change Washington Utilities Commission regulations that require delivery of "white pages" phone books	Waste Prevention 3.4

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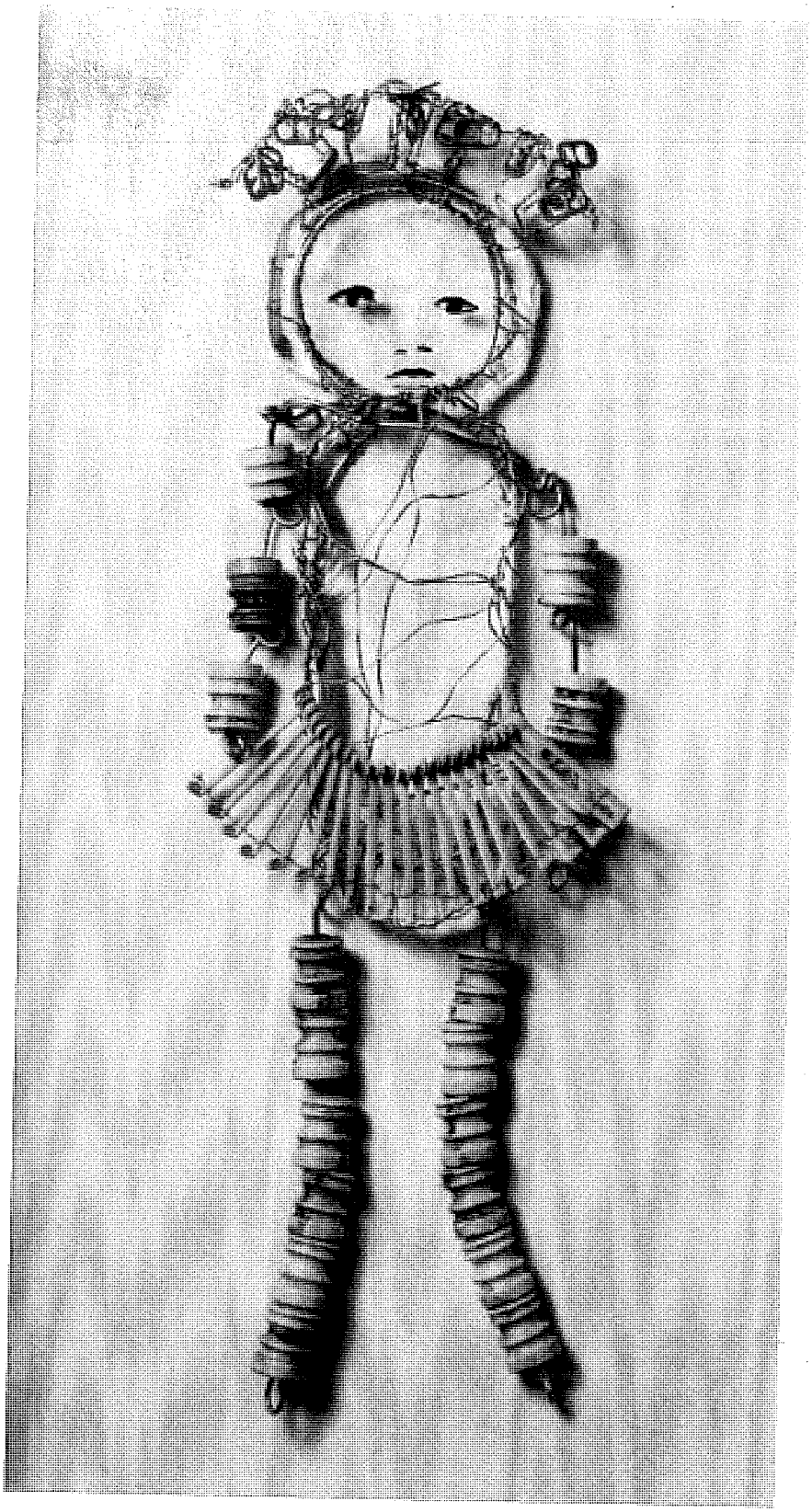

Chapter 1 REVISING SEATTLE'S SOLID WASTE PLAN

Seattle has been an international leader in solid waste management for decades. This has not been an accident. Much credit for the city's pacesetting role belongs to our public support for new and environmentally progressive solid waste programs. Consistent, thorough planning has also helped. This 2011 Plan represents another step in the evolution of Seattle's solid waste system.

1.1 WHAT'S BEING REVISED

This Plan revises Seattle's 1998 Solid Waste Management Plan, *On the Path to Sustainability*, as amended in 2004. The overall planning direction remains the same. However, this update presents an opportunity to step back and take a deep look at our system and possibilities for the future.

We are also taking advantage of this opportunity to create a very different document. In addition to meeting the legal requirement for a solid waste plan, this Plan will serve as a comprehensive resource document for our customers and other parties.

1.2 PLANNING HISTORY OVERVIEW

The State of Washington's 1969 legislation RCW 70.95 set the requirement for local solid waste plans. Seattle operated under the aegis of King County's 1974 and 1982 solid waste management plans until 1989. Seattle's first solid waste plan was the 1989 Integrated Solid Waste Management Plan, *On the Road To Recovery*.

In 1987, Seattle faced a waste management system crisis. The last two landfills, closed in 1983 and 1986, had become Superfund sites that would cost more than $90 million to make environmentally safe. We began hauling our garbage to the King County landfill, which radically raised its tip fees. Altogether, solid waste customer rates increased by 82%. Seattle thought there must be a less expensive option, and set out to find it.

The Solid Waste Utility (now part of Seattle Public Utilities) considered incinerating city garbage. Citizens immediately and overwhelmingly expressed their opposition. No one wanted an incinerator in the neighborhood, and many were concerned about air pollution and final disposal of the ash. The Utility responded to citizen concerns, and used the crisis as an opportunity to launch waste reduction and recycling programs that had never been attempted on so large a scale.

In 1998, Seattle prepared its second Solid Waste Management Plan, *On the Path to Sustainability*. That plan was updated by a 2004 Plan Amendment that the Washington State Department of Ecology approved in 2005.

In 2007, SPU and the Seattle City Council jointly conducted the Seattle Solid Waste Recycling, Waste Reduction, and Facilities Opportunities (Zero Waste) study. This study examined whether there were still other methods Seattle might use to reduce the amount of its solid waste and divert more from landfill disposal.

Following the 2007 study, the Mayor and City Council adopted Resolution 30990, the *Zero Waste Resolution*. The resolution re-committed the city to its 60% recycling goal for the year 2012. It also set a longer-term goal of 70% recycling by the year 2025, and outlined some additional actions and strategies for achieving these goals.

1.3 PLANNING PROCESS – CONTINUING THE VISION AND GOALS

The planning process for this revision involved regrouping around the vision and goals of prior planning. In writing this Plan, we are incorporating changes in the regulatory environment, involving key stakeholders, and developing a process for future Plan updates.

Seattle's 1998 Plan incorporated the key concepts of zero waste, waste prevention, sustainability, and product stewardship that continue to drive the contemporary approach to solid waste management.

1998 Plan Vision: Zero Waste

- Increase waste reduction and resource conservation
- Recycle 60% by 2008
- Increase the efficiency, fairness, convenience, and accessibility of services
- Expand local markets and increase purchases of recycled-content products
- Increase consumer and producer responsibility for sustainable waste management practices
- Implement the Seattle Sustainable Building Action Plan
- Improve sustainable waste management and resource conservation practices in City of Seattle operations
- Keep Seattle's neighborhoods clean and safe by partnering with communities.

The 2004 Plan Amendment renewed the 1998 vision with these enhancements:

- In 2010, there is an even more streamlined solid waste system, with integrated residential and commercial contracts and services, state-of-the-art transfer and processing facilities, and minimum transport and handling.
- More local markets are available, including infrastructure for processing food waste and construction debris.
- Garbage generation is declining. Both residents and businesses recycle aggressively. Builders, manufacturers, and retailers play a major role in sustainable design and product take-back.
- Organic composting has helped restore Seattle's soils and watersheds. The city's internal waste reduction, recycling, and buy-recycled programs are exemplary.
- By 2025, there has been a radical shift in how we think about waste. Most products are designed to be readily reused or recycled, and all costs incorporated into the price of the product. Garbage disposal is obsolete. Consumers, producers, and utilities provide the most efficient infrastructure for managing different products and materials.

This 2011 Plan revision continues the trend toward a model of resource management and consideration of life-cycle costs and benefits. It aligns with the vision, key principles, and strategies in Washington State's *Beyond Waste Plan* 2009 update.
The Plan further recognizes environmentally responsible solid waste management as a cornerstone strategy in climate protection plans. And its recommendations strive for equitable distribution of the costs and benefits of Seattle's programs.

Washington State Beyond Waste Vision

We can transition to a society where waste is viewed as inefficient, and where most wastes and toxic substances have been eliminated. This will contribute to economic, social and environmental vitality.

1.3.1 REGULATORY AND POLICY FRAMEWORK

Various state and local regulations, guidelines, and plans influence Seattle's solid waste planning.

State of Washington law RCW 70.95 requires solid waste plans and sets required content. In 2010, the state published *Guidelines for Development of Local Comprehensive Solid Waste Management Plans and Plan Revisions*. The state updated its solid waste plan *Beyond Waste* in 2009. Oregon State law regulates Columbia Ridge Landfill, in Arlington, Oregon, to which Seattle sends waste for disposal.

The City of Seattle has numerous ordinances, resolutions and administrative rules governing solid waste management. The 2007 **Seattle City Council Resolution 30990** (the *Zero Waste* resolution) and city climate protection initiatives have influenced solid waste management in recent years. Seattle establishes its solid waste rules in the city's Solid Waste Code (SMC 21.36, 21.40, and 21.44).

Seattle Public Utilities' (SPU's) 2009-2014 **Strategic Business Plan** sets the priorities of the utility over 6 years. It includes updated mission and vision statements for SPU and describes the

desired outcomes for our customers, and internal strategies we will put in place to achieve these outcomes. SPU actively supports the **Race and Social Justice Initiative** as part of the citywide effort to ensure that services are provided in an equitable manner to all citizens.

The City of Seattle **Department of Planning and Development** issues land use and building permits to solid waste facilities consistent with local regulations, just as they do with any development.

The **City of Seattle's Comprehensive Plan**, a collection of city-adopted goals and policies about how the city will accommodate growth over the next 20 years, incorporates planned needs for utilities, including solid waste facilities. The city has also developed **emergency plans** that include provisions for managing excess debris from an extraordinary event.

Public Health – Seattle & King County regulates solid waste handling facilities in Seattle and King County. Public Health, Seattle, King County, and the Suburban Cities Association jointly manage moderate risk waste (MRW) through the Local Hazardous Waste Management Program.

1.3.2 PARTICIPANTS AND RESPONSIBILITIES

The parties involved in planning this solid waste plan update have certain roles and responsibilities.

Government

- **Seattle Public Utilities (SPU)** has responsibility for creating, executing, funding all City of Seattle solid waste programs and projects
- **Office of the Mayor** sets direction for all city departments, including SPU
- **Seattle City Council** is the city's legislative body and adopts the Plan by resolution
- **Washington State Department of Ecology** reviews and approves this Plan

Other Stakeholders

- **SPU's Seattle Solid Waste Advisory Committee (SWAC)** provides policy advice and is involved throughout the planning process
- **General Public** includes residents and businesses, solid waste industry representatives, and interest groups. The public's role is played out via the Plan's Public Involvement process, which includes heightened efforts to reach hard-to-reach populations through innovative means. Appendix C, Public Involvement, gives detail on the public process.

Each of these parties has their own perspective on the Plan. The Plan is meant to serve as a resource for all of them. For example, regulators are interested in ensuring the Plan meets legal requirements. SPU will use the Plan to guide solid waste work in the coming years. And the public is interested in what changes are coming their way.

1.3.3 KEEPING THE PLAN UP TO DATE

SPU will update the Plan at least as often as required by RCW 70.95, currently at least every 5 years. The steps to do so involve assessing whether the update is an amendment or a revision, as defined by Washington Department of Ecology. **Amendments**, generally, are minor

adjustments to the Plan within the 5-year planning window, keeping the plan up to date for permitting and grant purposes. If it has been 5 or more years since the last Plan **revision**, the next update would most likely have to be a revision. Changes in disposal methods or facilities would also trigger a revision.

For Seattle, the **basic every-5-year process** starts about 24 months before the next update is due, with SPU conducting a thorough review of the current Plan's policies, programs and timelines. The review involves highlighting key potential changes. The key potential changes then need evaluating as to whether they'd lead the Plan update to be an amendment or revision. SPU will confer with Ecology before proceeding with either.

The update **process could also be triggered in other ways**, For example, SPU routinely reviews progress via the Annual Recycling Report. In addition to reporting recycling rates, this report describes program actions completed in the year being reported. It also includes the program actions planned for the following year. This is where minor variations from planned programs will be documented. Before the annual report is finalized, the Seattle Solid Waste Advisory Committee (SWAC) reviews it and gives comment. The final report goes to the Seattle City Council by July 1, when it is also posted on SPU's website.

If progress tracked through the Annual Recycling Report does not perform as expected, we will figure out what the problems are. The analysis could lead SPU to pursue a policy change that is significantly different from, or not contemplated in, the Plan. In that case, a Plan amendment or revision may be necessary.

In addition to reviewing the Annual Recycling Report, the SWAC discusses solid waste issues throughout the year. A new recommendation from the SWAC could also potentially trigger a Plan amendment or revision. Similarly, new directives from Seattle's elected officials could trigger a change to the Plan. Proposals from the public would be managed through SPU, our elected officials, or the SWAC. SPU is responsible for managing and supporting the discussions and related processes stemming from proposals, whatever the source. SPU ensures SWAC involvement at all stages.

Another possible trigger to launch a Plan update could be an emergency action. This Plan does include post-emergency actions to deal with solid waste and extra debris, as described in section 4.7. However, there is a chance that SPU could take an emergency action that would trigger a Plan update in normal times. SPU will inform the SWAC and other key stakeholders about such actions, as soon as that is feasible. Temporary actions will not require a Plan update. On the other hand, an emergency action could become permanent or could be seen as significant. If so, SPU will coordinate within the city, with the SWAC, and with Ecology as to whether the action triggers a Plan amendment or revision.

SPU will write Plan amendments. Amendments will be adopted after review and comment by the SWAC. SPU will also obtain any needed approvals from Seattle's elected officials as warranted by the changes. Finally, SPU will submit amendments to Ecology within 45 days of adoption.

If a Plan revision is the right course of action, SPU will follow the steps outlined in Ecology's "Guidelines for Development of Local Comprehensive Solid Waste Management Plans and Plan Revisions, 2010," including public involvement. The SWAC will take part at the outset and throughout the revision process.

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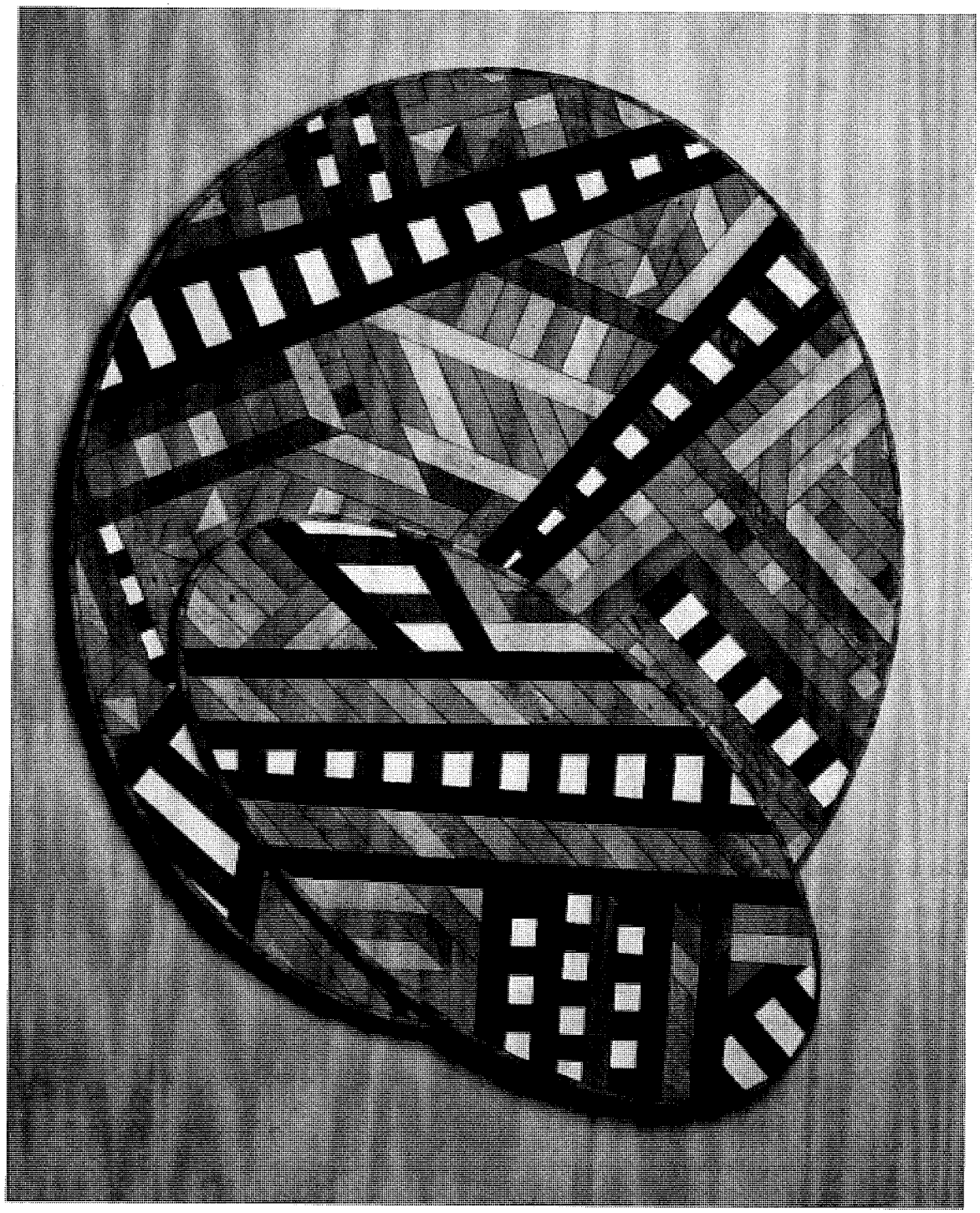


Chapter 2 SEATTLE SOLID WASTE TRENDS

This chapter describes Seattle's physical setting, population, and solid waste generation trends. All of these factors set the landscape of the solid waste planning environment. The forecast for Seattle's population indicates increases. Employment should rise, with a shift away from manufacturing. With people and jobs increases, the total generation of discards will also rise. Robust sources of data and analytic tools support projections and progress tracking.

2.1 PHYSICAL ENVIRONMENT

Seattle enjoys a central location in the Greater Puget Sound Region. The city takes up just over 142 square miles, including nearly 60 square miles of water. Puget Sound borders the city to the west, with Lake Washington bordering to the east. Some of the city's terrain is hilly, and the entire region is in a major earthquake zone. Seattle's marine climate is mild year-round, with wet winters and relatively dry summers.

Seattle's two major north-south transportation corridors are State Hwy 99 (Aurora Ave through much of the city) and Interstate 5. Interstate 90 connects eastward to the rest of the country. Seattle is also well serviced by rail lines to the north, south, and east. Washington State ferries are the city's major connection to the west.

2.2 HUMAN ENVIRONMENT

Demographic factors important for solid waste planning include population, household trends, and employment trends. Outreach planners need information on the various languages spoken in the city. From looking at employment trends, SPU learns what kinds of businesses (and their attendant wastes) will be contributing to the commercial waste steam.

2.2.1 POPULATION

Seattle's population is forecast to increase by almost 8% between 2010 and 2020 (Table 2-1). Over the same period, numbers of single-family homes will increase by about 3% and multi-family units by about 12%.

Table 2-1
Seattle Population and Household Trends

Year	2000	2005	2010	2015	2020
Population[1]	563,374	573,076	608,660	631,350	655,947
Occupied Household[1]	258,481	266,204	283,510	294,158	303,557
Single Family thru 4-plex units[2]	153,853	151,217	158,533	162,376	163,724
Multi Family with 5 or more units[2]	104,628	114,987	124,977	131,782	139,833
Average Household Size	2.180	2.153	2.147	2.146	2.161

[1]Source: Puget Sound Regional Council 2011
[2]Source: SPU Accounts

According to the American Community Survey 2009, 79% of Seattle's population speaks English only. About 6% are "linguistically isolated," which means they feel proficient only in a language that is not English.

2.2.2 EMPLOYMENT

Employment forecasts show Seattle employment rising through the year 2020 (Table 2-2). The numbers of employees in each type of sector factor into the volumes and types of waste generated from businesses. The office sector employs more than twice as many people as the next highest sector, health and education. The third highest sector is services. All employment sectors are forecast to rise except manufacturing.

Table 2-2
Seattle Employment Trends through 2020

	Year				
Sector	**2000**	**2005**	**2010**	**2015**	**2020**
Manufacturing	45,195	37,646	36,973	37,693	36,053
Wholesale and Retailer	54,544	49,219	47,522	51,852	53,871
Food Services and Drinking Places	27,682	26,865	25,939	29,429	32,531
Services	59,062	55,264	58,479	76,657	91,025
Office	187,663	174,895	177,473	181,314	191,925
Health and education	81,211	76,758	78,809	89,412	98,836
Food and Beverage Stores	9,644	8,984	8,675	9,842	10,879
Transportation, Hotels, and Construction	52,200	46,668	46,470	52,723	58,279
Total	517,201	476,299	480,340	528,922	573,399

Sources: SPU estimates; Washington State Employment Security Dept. data; and SPU forecast model (updated March 2, 2011)

Waste generation directly correlates with economic cycles. MSW generation (garbage plus recycling and organics) dropped with the recession after the economic high of 2007. SPU expects total generation to rise again as the economy recovers, minus the effects of waste prevention programs.

2.3 WASTE DEFINITIONS

Terminology for waste can be confusing. The following section describes key terms applied to categories of solid waste.

2.3.1 WASTE CATEGORIES

There are several categories of wastes (discarded materials) generated in Seattle.

Municipal Solid Waste — MSW includes all the garbage, recycling, and organics (yard and food waste) collected from within Seattle and hauled to the city's recycling and disposal (transfer) stations. It also includes some construction and demolition (C&D) wastes that are disposed at city transfer stations or placed in residential or business garbage containers. See Chapter 4, Seattle's MSW System: Managing Discards.

Construction, Demolition and Land-clearing Debris — This category is called construction and demolition or C&D. C&D includes wood waste, metals, asphalt roofing, gypsum, and other materials generated by construction activities that is not disposed at city-owned transfer stations or mixed with MSW garbage. It is managed separately from MSW for recycling and disposal. See Chapter 5, Other Solid Waste Programs, section 5.1 for detail on C&D.

Moderate Risk Waste — MRW includes household hazardous waste (HHW) and small-quantity generator waste (SQGW). Seattle manages its MRW through a joint program supported and implemented by the City of Seattle, King County, Public Health - Seattle & King County, and the Suburban Cities Association. The joint program, the Local Hazardous Waste Management Plan, guides MRW management. See Chapter 5, Other Seattle Solid Waste Programs, section 5.4 for information on MRW.

Other Special Categories of Waste — These are wastes not allowed in the MSW. They require special handling and disposal due to regulatory requirements or other reasons such as toxicity, volumes, or particular handling issues. Examples include biomedical, asbestos, biosolids, and dangerous wastes. See Chapter 5, Other Seattle Solid Waste Programs, section 5.5 for detail on this category.

2.3.2 RECYCLING AND DISPOSAL DEFINITIONS

Recycling and disposal are categorized into many modes and methods.

Waste Prevention — Used interchangeably with "waste reduction," and sometimes called "precycling." This is the practice of minimizing waste through responsible purchasing and consumerism. Essentially, this practice removes waste from the waste stream by not creating it in the first place.

Recycling — Recycling remanufactures or transforms waste materials into usable or marketable materials, including organics to composting.

Disposal — When Seattle disposes waste, the waste materials are permanently placed in a landfill. Seattle counts Beneficial Use, alternative daily cover (ADC) and industrial waste stabilizer (IWS) as disposal for the MSW recycling rate calculation.

Beneficial Use — Neither recycled nor reused, the waste materials are used for some other purpose like industrial boiler fuel.

Alternative Daily Cover (ADC) and Industrial Waste Stabilizer (IWS) — ADC refers to materials used to cover the active face of a landfill instead of soil. IWS includes waste materials deposited to provide structure in specialized landfills.

Diversion —This term includes recycling and beneficial use. SPU calculates diversion for the C&D stream.

2.3.3 MSW SECTOR DEFINITIONS

Seattle's MSW waste is generated by four sectors.

- **Residential – Single-Family.** This sector includes waste picked up from homes that have cans or carts picked up at the curb. These are typically single-family homes, up to and including four-plexes.
- **Residential – Multi-Family.** The multi-family sector is for waste picked up from residential buildings or complexes that have dumpster or detachable container service. Typically, these buildings have five or more housing units.
- **Commercial.** This sector includes businesses. Typically, dumpsters are picked up as needed by the account that serves these commercial buildings.
- **Self-Haul.** The self-haul sector is that part of our system where residents and businesses bring various materials for drop-off at city-owned transfer stations.

See Chapter 4, Seattle's MSW System: Managing Discards, section 4.3 for information about the MSW sectors.

2.4 MSW RECYCLING MEASUREMENT

Existing programs are measured by a variety of means depending on the program. SPU's core measurement and reporting is done by MSW sector. We also measure waste prevention to the extent possible. The primary vehicle for reporting recycling progress is the City of Seattle Annual Recycling Report. C&D measurement is not included in the annual calculations of Seattle's progress towards its MSW 60% recycling goal. See Chapter 5, Other Seattle Solid Waste Programs, section 5.1 for information about C&D trends.

2.4.1 RESIDENTIAL DATA

SPU's residential data come from reporting requirements built into our collection contracts. We have data for each truck trip through a Seattle neighborhood to a processing center. Weekly trip data include the total of all materials collected as garbage, recycling, and organics. SPU summarizes the data quarterly (showing monthly data) and posts the summaries on the SPU website.

SPU also conducts periodic studies where materials put out for collection are sorted and measured to determine what is in the collected material. These periodic sorts are called *composition studies.*

The organics collection program is similar in that SPU receives data at the truck trip level from the residential collection contractors. The composition of the organics container (how much is

food waste versus how much is yard waste) is estimated using the Seattle Discards Model, a statistical model that separates out the tons based on historical data relationships.

The oil and electronics collected curbside are tracked via monthly reports from the contractors.

SPU measures onsite (home) organics programs using a variety of information sources. The most important information is that from the Home Organics Survey. SPU conducts this survey every 5 years to update our understanding of home organics practices. Information on how many households compost and grass cycle is combined with other data on average amounts of yard and food waste per household. SPU uses all of these data to estimate the number of tons diverted through the home organics programs. Since we do the Home Organics Survey only every 5 years, estimates for tons diverted remain constant for 5 years until SPU has new data to re-estimate the tons diverted.

2.4.2 SELF-HAUL DATA

Recycling in this sector consists of 1) self-hauled organics (for composting), and 2) a variety of other recyclable materials placed in drop boxes.

SPU uses scale house data (weight and trip) as customers enter the station to measure tons brought into transfer stations for compost. SPU also has data on how much compost material we haul from the stations to processing facilities. Having both sets of data serves as a check on the total tons of compost material. Compost tons are reported quarterly (monthly data) on the Residential Organics Report.

Drop-box recycling tons are weighed when SPU hauls the material to the various processors. Typically, customers who bring in material to recycle do not weigh in their vehicles. Instead, the data source is outbound weight reports from the trucks that haul recyclables away from the stations.

In addition to reporting these data annually as part of the Annual Recycling Report, SPU is required to report the data to the Washington State Department of Ecology.

2.4.3 COMMERCIAL DATA

The primary source of information for the commercial sector comes from annual reports required from recyclers and processors. Recyclers who operate in Seattle must submit the reports as part of their City of Seattle Recyclers Business License. Specifically, recycling businesses must report annual tons recycled, by material, and disposition of the material. Once SPU receives the reports, we analyze them at length to make sure we do not double count tons. (It is common for one recycler to collect material and then transfer it to another processor). The City of Seattle mails a form to recyclers in February with a completion deadline of March 31. For the 2010 report, SPU mailed forms to more than 150 companies.

In addition to the recyclers' reports, SPU receives detailed trip level data for compost and recycling tons collected under our collection contracts. These tons are currently combined with the information from the recyclers' reports and reported in the Annual Recycling Report.

2.4.4 WASTE PREVENTION DATA

SPU's waste prevention programs reduce the amount and toxicity of material entering Seattle's waste system. For the annual recycling rate, we estimate the tons of prevented waste and count them as recycling.

Other than for the home organics programs, SPU tracks waste prevention on a program-by-program basis. We use a variety of methods to measure tons not generated. These methods include the following: self-weighing; pre- and post intervention surveys (attitudes, behaviors, participation rates); collection data; composition studies; and estimation (modeling). The best approach is to build evaluation methodology into new waste prevention programs and campaigns.

Less waste generated per person would seem to imply more waste prevention. However, it is very difficult to separate the effects of the waste prevention program from other variables like changes in household size, the economy, types of businesses in Seattle, and products.

2.4.5 WASTE COMPOSITION DATA

Waste composition—what mix of materials is going to disposal—is assessed every 4 years, on staggered cycles by sector. These studies sort and weigh the disposed materials into dozens of categories. The studies are available on SPU's website.

The studies contribute key data for the Recycling Potential Assessment (RPA) modeling described in Chapter 4, Seattle's MSW System: Managing Discards, section 4.3. See also Appendix D, Recycling Potential Assessment Model for more RPA detail.

2.4.6 SEATTLE DISCARDS MODEL

The Seattle Discards Model (SDM) is a tool SPU uses to analyze recycling performance. The SDM establishes a relationship between garbage, recycling, and organics (food and yard debris) monthly collection quantities, and the factors that affect (or "explain") these discards amounts. For instance, one equation in the model estimates the impacts of increased household size or additional household income on the amount of discards that households place in the curbside recycling stream. Another part of the equation estimates the impacts on residential garbage from similar changes.

The SDM contains a set of equations to calculate expected garbage, recycling, and organics discard quantities depending on factors such as:

- Unemployment rate
- Housing prices
- Household size
- Actual status of household income
- Average and marginal fees for collection
- Other factors such as temperature and precipitation

If a new factor (or a shock to the system) emerges, such as the introduction of a disposal ban, the SDM can isolate the tonnage impact of the ban from the other factors that are also affecting waste tonnage.

The SDM includes equations for residential garbage, residential recycling, residential organics, self-haul garbage, and commercial garbage. Each equation has its own set of factors, which explain the various garbage and recycling streams. Variables in the equations have changed over time, but the overall methodology is the same.[1]

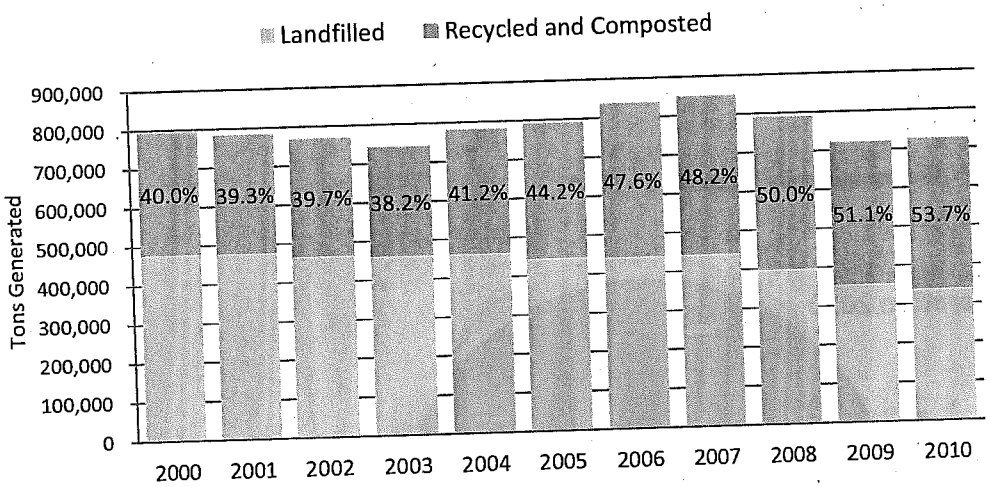
2.5 WASTE & RECYCLING TRENDS

This section describes year-over-year waste and recycling trends in Seattle.

2.5.1 OVERALL MSW TRENDS

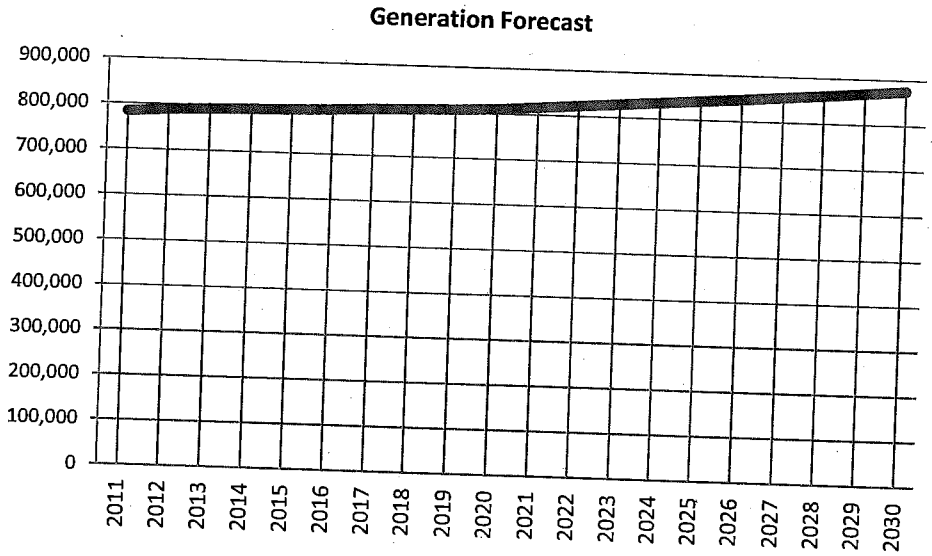
Seattle's overall MSW generation has generally followed economic trends, even as population has steadily increased in our city (Figure 2-1). The overall recycling rate declined the first few years of the past decade then has steadily climbed since 2003. SPU expects overall waste generation to increase gradually over the planning horizon of this Plan (Figure 2-2).

Figure 2-1
Seattle Overall MSW Tons Generated and Recycling Rate



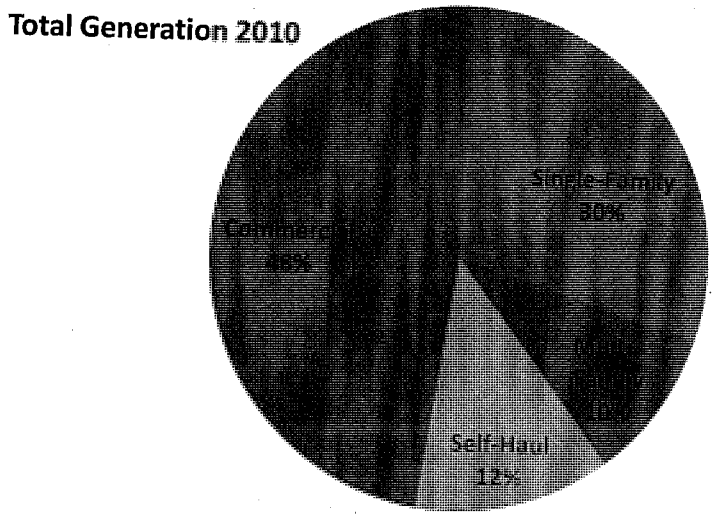
[1]A complete technical explanation of the model can be found in "The Seattle Discards Model: An explanatory Model for Garbage, Recycling and Yard Debris Collection and Self Haul Quantities," SPU, December 2005.

Figure 2-2
Seattle MSW Generation Forecast



Overall generation is the sum of each sector's share of all discards. Proportionally, shares shift a bit over time. Figure 2-3 shows shares from 2010 and illustrates that the commercial sector generated almost half of Seattle's discards. The single-family sector contributed almost one-third of Seattle's MSW.

Figure 2-3
Seattle MSW Generation by Sector for 2010



2.5.2 SECTOR MSW TRENDS

As described in this chapter, SPU tracks MSW and recycling performance trends by each of the four MSW Sectors. The following figures illustrate trends for material amounts entering each sector and recycling performance (Figures 2-4 through 2-7).

Figure 2-4
Single-Family Waste Generated, Recycled, Disposed in Seattle 2000-2010

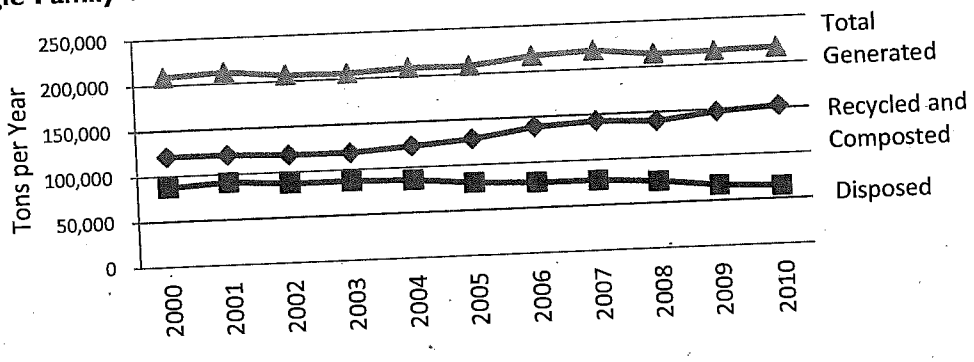


Figure 2-5
Multi-Family Waste Generated, Recycled, Disposed in Seattle 2000-2010

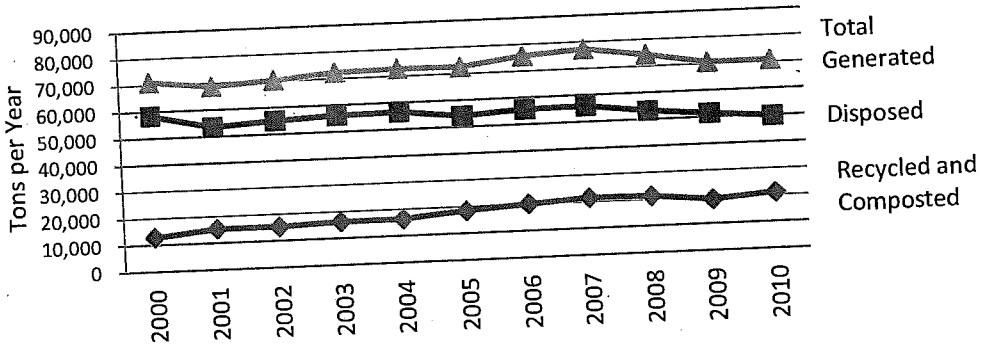


Figure 2-6
Self-Haul Waste Generated, Recycled, Disposed in Seattle 2000-2010

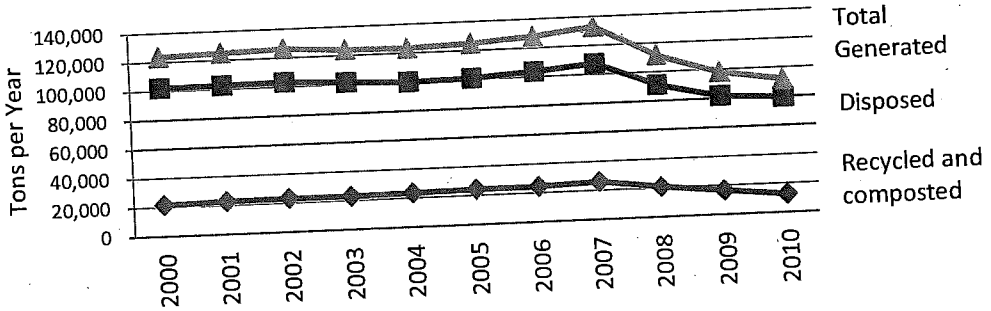
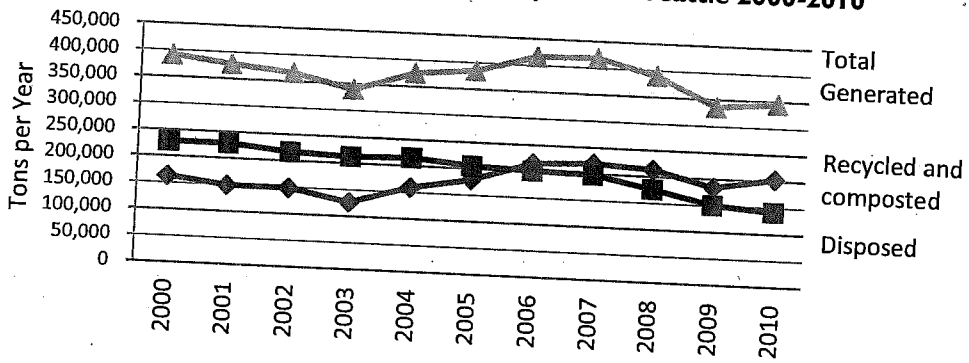


Figure 2-7
Commercial Waste Generated, Recycled, Disposed in Seattle 2000-2010



2.5.3 SECTOR RECYCLING GOAL PROGRESS

Seattle has made substantial progress toward the recycling goals set in the 2004 Amendment. The overall goal was a 60% recycling rate. Within that goal, each sector had its own target (Table 2-3) and varying success toward reaching the target.

Table 2-3
Seattle Recycling Goal Progress 2010

Sector	2000	2002	2004	2006	2008	2010	Goal set 2004
Single-Family	58.0%	57.5%	58.9%	64.0%	65.4%	70.3%	70.0%
Multi-Family	17.8%	21.5%	22.2%	26.3%	28.3%	29.6%	37.0%
Self-Haul	17.2%	18.1%	18.8%	18.8%	18.4%	13.5%	39.0%
Commercial	41.6%	40.7%	42.5%	51.7%	54.7%	58.9%	63.0%
Combined - All Sectors	40.0%	39.7%	41.2%	47.6%	50.0%	53.7%	60.0%

More needs to be done to increase Seattle's recycling rate. The recycling recommendations in Chapter 4, Seattle's MSW System: Managing Discards, section 4.3 contain a variety of initiatives to increase recycling in all sectors.

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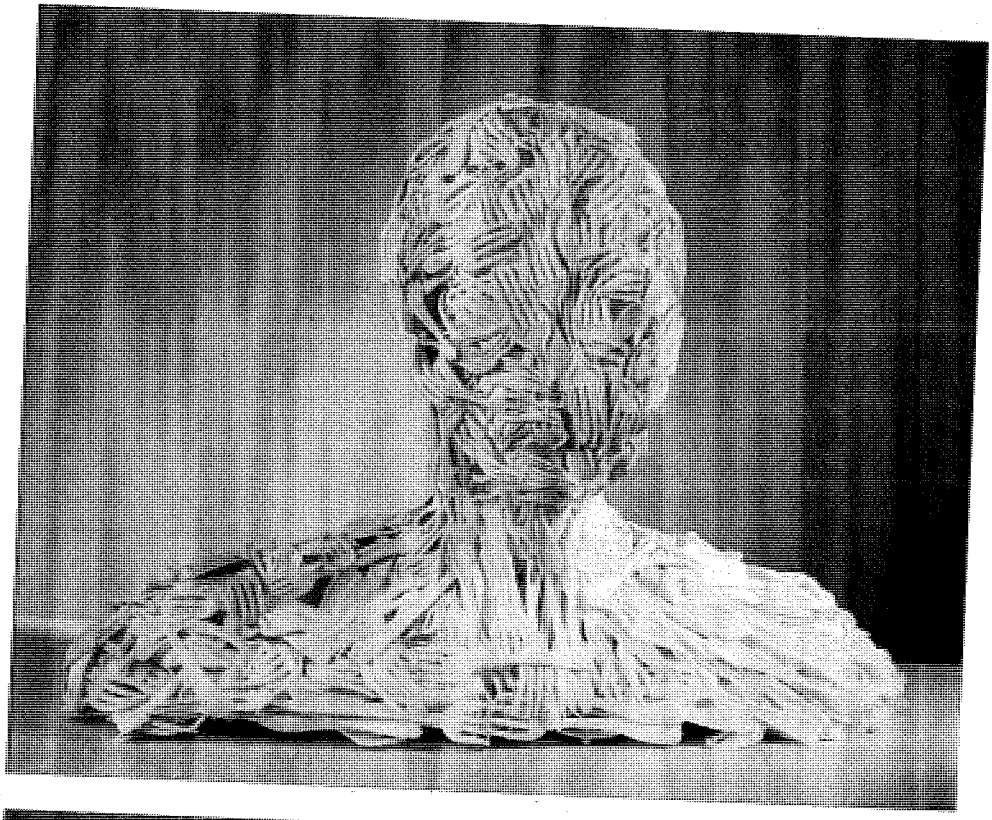
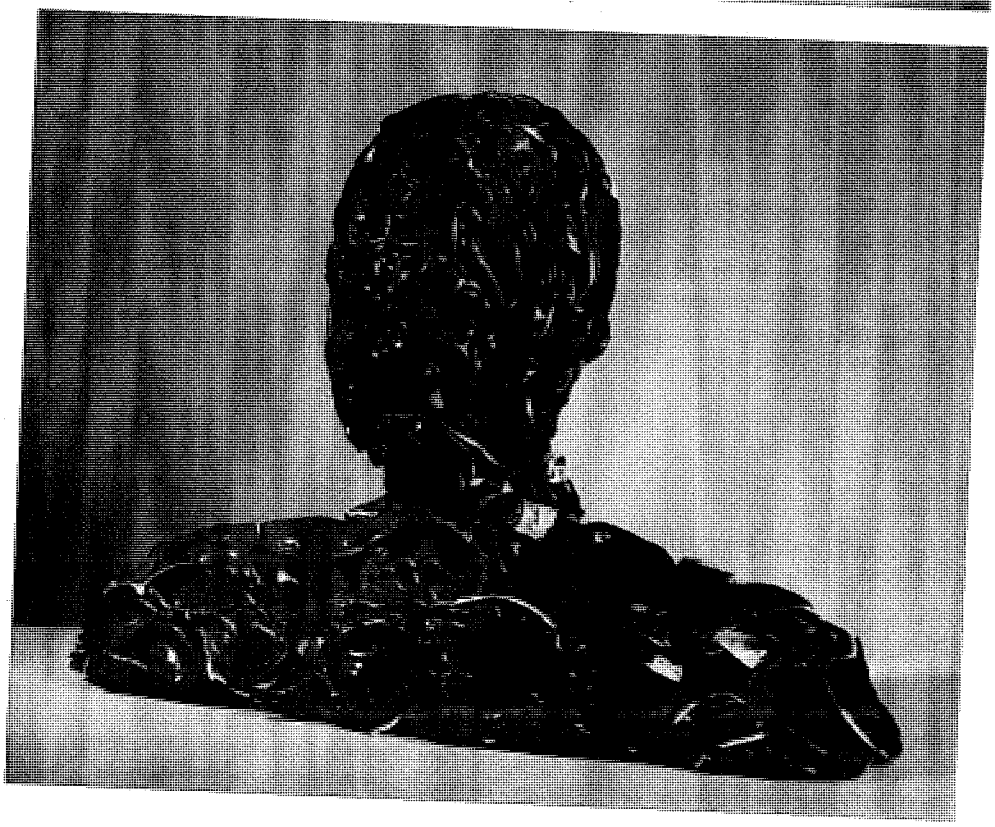




Chapter 3 WASTE PREVENTION

Waste prevention removes waste from the waste stream by not creating it in the first place. It is sometimes referred to as waste reduction or *precycling.* Seattle Public Utilities' waste prevention programs promote more careful purchasing and consumption by institutions and individuals. These programs also promote more efficient use of materials in business and industrial activities. This chapter describes SPU's waste prevention programs under the 1998 Solid Waste Plan and 2004 Plan Amendment. It also discusses issues for waste prevention planning, recommendations for the future, and approaches to waste prevention measurement.

3.1 RECOMMENDATIONS FROM 1998 PLAN AND 2004 AMENDMENT

In the 1998 Plan, SPU outlined and in the 2004 Amendment reaffirmed waste prevention programs in the following areas (Table 3-1):

- **Reuse** — programs promoting goods and materials exchange opportunities to residents and businesses
- **Onsite Organics** — programs for backyard composting, grasscycling, and pesticide use reduction under a "Natural Lawn and Garden Care" theme
- **Sustainable Building** — U.S. Green Building Council's Leadership in Energy & Environmental Design (LEED) standards for city-owned buildings. Sustainable building includes promotion of building materials salvage and recycling.
- **Product Stewardship** — participation in the inter-governmental Northwest Product Stewardship Council and the national Product Stewardship Institute. Stewardship includes support for state legislation requiring producer responsibility for end-of-life materials management.
- **Other Waste Prevention Activities** — expanded City of Seattle green purchasing practices. Other activities include public education on better or safer products to use and general waste reduction through SPU publications, media, and SPU's outreach consultant.

In the sections that follow, these programs are described in detail, including the changes they've undergone over time.

Table 3-1
Seattle Waste Prevention Goals 1998 and 2004

Recommendation	Status
1998 Plan	
Increase waste reduction and resource conservation	Ongoing
Increase consumer and producer responsibility for sustainable waste management practices	Ongoing Notable success in producer responsibility for electronic wastes
Implement Seattle Sustainable Building Action Plan	Ongoing New and renovated city buildings meeting Leadership in Energy and Environmental Design (LEED) standards
Incorporate waste prevention into broader conservation message	Ongoing
Maximize impacts of conservation messages by partnering with other agencies	Ongoing Partnerships with King County and Local Hazardous Waste Management Program, and others
Target high-quantity materials, especially yard debris	Banned landscape waste from residential and commercial garbage. Continuing increases in compostable materials collected curbside
2004 Amendment	
Increase waste reduction and resource conservation	Ongoing
Increase consumer and producer responsibility for sustainable waste management practices	Ongoing Successes in product stewardship for electronic waste and mercury containing lighting, Styrofoam food packaging ban and requirement that single-use food service packaging be compostable or recyclable
Implement Seattle Sustainable Building Action Plan	Ongoing With new regulations for deconstruction and increasing regulation of C&D wastes
Reduce toxic products in waste stream	Increased electronic waste recycling with E-Cycle Washington. Upcoming mercury lighting producer-paid end-of-life management. Green purchasing steadily improving
Continue to incorporate waste prevention into multi-dimensional conservation programs	Ongoing
Expand city's waste prevention activities to incorporate waste prevention targets established in "Sustaining our Commitment" Mayor Nickels' Plan to Reaffirm Seattle's Leadership in Recycling January 2003	Done
Focus on high-volume materials (paper and organics) and high-toxicity materials such as mercury	Ongoing Ban on paper and yard debris in residential and commercial collection. High-toxicity products primarily addressed by Local Hazardous Waste Management Program initiatives, or regulated through state legislation
Develop programs to influence organizational not just individual behavior	Ongoing Includes green purchasing, institutional food service efficiency, and food service packaging regulations.
Establish methodology to measure non-SPU sponsored commercial waste prevention activities and give credit to businesses for waste prevention efforts	Ongoing Most effective in construction and demolition (C&D) salvage, deconstruction and recycling programs

3.2 PLANNING ISSUES FOR THIS UPDATE

This Plan update responds to a number of changes in the financial, political, and regulatory environment for waste prevention. It is also informed by the understanding SPU has gained from the past 5 years of program implementation. In those years, climate change has increased the importance of green house gas reduction in every area of city activity. Waste prevention is no exception. Reduction in materials, their use, and shifts in product design from disposable to recyclable are issues in this Plan.

3.2.1 *ZERO WASTE RESOLUTION*

City Council actions led to the biggest changes in SPU waste prevention activities. Those directives have called for definitive results over the next few years. Chief among the policy directives is Resolution 30990, known as the *Zero Waste Resolution*, passed in June 2007. The *Zero Waste Resolution* instructed SPU to:

- Increase support for the Northwest Product Stewardship Council
- Study problem (hard-to-recycle) products and propose strategies. The emphasis should be on the application of product stewardship principles. Strategies range from bans to market development that would reduce the presence of these products in the waste stream.
- Study bans of plastic shopping bags and expanded polystyrene (EPS, sometimes called Styrofoam) food service ware
- Participate in the state's electronic products take-back system, E-Cycle Washington
- Create a program of community waste prevention matching grants
- Develop strategies to increase recycling by customers self-hauling waste to the city's recycling and disposal stations
- Work with the Department of Planning and Development (DPD) to modify the demolition permit process to increase building materials salvage
- Increase waste-reduction audits and education for business and single- and multi-family customers

Actions in most of these areas have become part of the City of Seattle's waste prevention programs.

3.2.2 RECESSION

A second large influence on the City of Seattle's waste prevention programs was unanticipated. The deep recession beginning in 2007 reduced SPU revenue, which resulted in deep cuts in the waste prevention budget. Most programs—with the notable exception of support for recyclable and compostable food service packaging—will be curtailed, possibly, for several years. For example, SPU put further study of problem products (toxic and hard-to-recycle materials, or recyclables still unsupported by markets) on hold at the end of 2009.

3.2.3 *BEYOND WASTE*

Among regulatory changes, the Washington State Department of Ecology (Ecology) released its revised *Beyond Waste* comprehensive plan for the state. Notable among its recommendations for waste prevention is a call for greater attention to the "technical nutrient cycle." This concept forces attention on closed-loop systems for processing and reuse of materials. The idea is to minimize "down-cycling" of materials into lower value products. SPU plans to address this mandate two ways:

1. Continued emphasis on market development for under-recycled materials
2. Work with the industrial sector to promote exchange of process byproducts from businesses that need to discard materials to those that can use them in production.

The new *Beyond Waste* plan also calls out waste prevention for product packaging. Seattle is already deeply involved in single-use food service ware and packaging regulations. The City of Seattle also participates on the Northwest Product Stewardship Council's packaging subcommittee, which is examining packaging regulations used in Europe and Canada.

Reuse is a key part of the state's *Beyond Waste* hierarchy of "reduce, reuse, recycle." Reusing consumer products and industrial materials (such as production byproducts) slows the frequency of product and materials replacement. It also reduces green house gas generation from producing new products, whether of virgin or recycled materials.

In general, product and materials reuse is the result of individual or individual business decisions. Consequently, policies promoting reuse mostly emphasize public education, attempting to change behavior by changing attitudes and beliefs. Reuse programs need to be designed to make it easy for the public and businesses to take action--choosing charitable donation rather than disposal, for example. Only rarely does reuse policy directly involve regulation.

3.2.4 PRODUCT STEWARDSHIP LEGISLATION

Product stewardship is a strategy that places responsibility for life-cycle environmental impacts on designers, producers, marketers, and users of products. Product stewardship is often called *Extended Producer Responsibility* or EPR. It seeks to minimize environmental impacts, including reducing toxic contents, throughout a product's life cycle. Greatest responsibility lies with whoever has the most ability to affect the life-cycle environmental impacts of a product. That is usually the producer or "brand owner."

New product stewardship legislation in Washington state and nationally has spurred interest in producer responsibility strategies for waste prevention, increasing recycling, and managing waste. Legislation is a key tool by which producers may be charged with funding and managing products at the end of product life.

Product Stewardship Changes Who Pays and How

Producers may bear the costs of reuse and materials recycling programs in two ways. One is cost internalization, in which end-of-life costs are included in a product's price (as they are in the E-Cycle Washington program). This is generally the preferred alternative. Another way for producers to bear the costs is by paying fees to local solid waste agencies. Producers, stewardship organizations acting for groups of producers, or even product users may be subject

to the fees. Currently, solid waste and recycling collection and processing is almost entirely a local government responsibility paid for by residents and businesses in the local service area.

Cost Internalization

Producer funded take-back services have emerged as the model for producer funded recovery programs. These services include waste handling that is funded or provided by producers of materials. The materials are (mostly) handled outside the city solid waste system. Products already covered by producer product stewardship programs, or under consideration at the state level, include electronics, pharmaceuticals, carpet, and products containing mercury. The list continues to grow with legislation for paint and rechargeable batteries under consideration in 2012. In this case, the program funding is from producers through a stewardship organization.

Targeted Fees

In lieu of statewide programs, Seattle has in some cases adopted or considered "recovery" fees, which may be applied in a variety of ways depending on program goals:

- **Consumer Recovery Fees** — These fees are designed to affect consumer choices and are charged when a product is purchased. There are at least two types:
  - A fee established as a City of Seattle solid waste fee and remitted to the Solid Waste Fund to cover solid waste services.
  - A fee required by city regulation to be charged by businesses, to discourage purchase or use of a product, and retained by the seller to cover fee administration costs.
- **Producer Paid Recovery Fees** — Producers, or in some cases retailers, may pay fees to the Solid Waste Fund when a product is either sold or distributed. SPU would use these fees to pay for recycling or disposal of that product. It could also use the revenue for waste reduction programs designed to reduce demand for (or waste associated with) that product.
- **SPU Rates** — Rates are charged for city handling of products that have been used and discarded as solid waste. Rates are based on what is discarded rather than on what is bought or distributed (the focus of recovery fees). Products suited to rate funding include food waste and yard waste.

While cost-internalized, industry-paid stewardship programs are the best approach, visible recovery or producer fees might be considered for specific products or materials to:

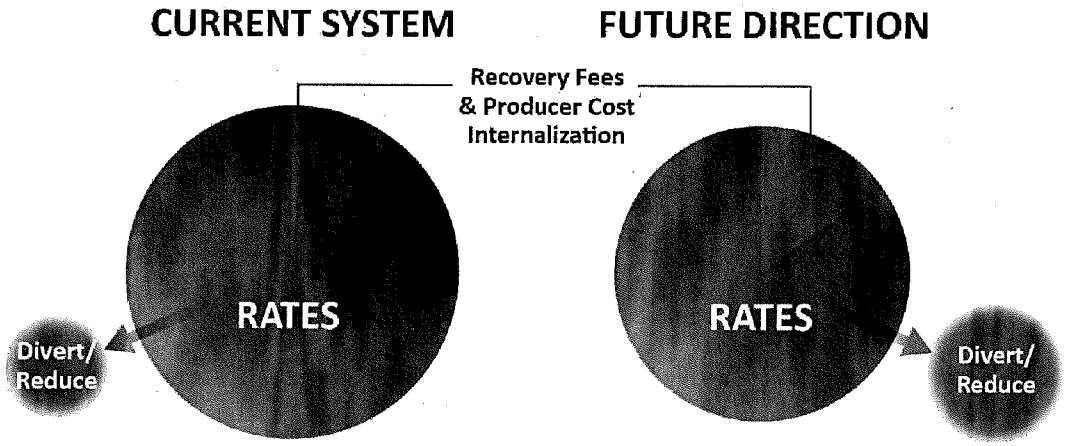
- Recover collection and disposal costs
- Divert toxic or other problem materials in the absence of state regulation
- Affect consumer choices to reduce or avoid use of a product or material
- Promote waste reducing product and packaging redesign
- Place responsibility and management costs on producers and users of various products rather than on the entire community of solid waste ratepayers
- Discourage use of products intended for one-time use when reusable alternatives are available

Product Stewardship Changes Behaviors

An expected outcome from requiring producers to pay for end-of-life management of what they make is more attention to product design, to make reuse and recycling easier. Reuse or recycling is preferred whenever possible.

Product stewardship can also influence consumer behavior (Figure 3-1). As product stewardship costs are either internalized into the cost of the product, or made visible to the buyer as "advance recovery fees" or "eco fees," consumers may choose to purchase less and to buy less wasteful products.

Figure 3-1
Producer Cost Internalization and Recovery Fees Change Who Pays



Product Stewardship Eases Ratepayer Burden

Cost internalization and fees for end-of-life product management both ease the burden on general solid waste ratepayers through:

- Industry established and managed reuse and recycling programs, such as take-back services, that prevent products from entering the MSW system
- Producers paying local jurisdictions for managing the material, in cases where that is a more effective strategy

Strategic Considerations

Product and materials impacts extend across jurisdictions. Industry prefers state or federal regulation to "level the playing field." For that reason, producer take-back programs generally have been pursued through statewide legislation and programs rather than through City of Seattle efforts. These regulations are often intended to divert waste from the city solid waste system. For example, the E-Cycle Washington program for computers, "tablet" sized devices,

and televisions diverts all those products from MSW to a separate collection system funded by manufacturers.

A disposal ban of certain materials (such as hazardous materials) might be used in conjunction with a producer take-back or a government-sponsored special collection and management system. Seattle has also used disposal bans in conjunction with rate design to shift materials from garbage to recycling or compostable waste.

The following questions need to be answered in planning new product stewardship programs:

- **Who pays?**
  - consumer at time of purchase
  - retailer or producer through "cost internalization" (where recovery cost is imbedded in the price of the product and not visible)
- **Who receives the revenue?**
  - City of Seattle Solid Waste Fund
  - retailers selling a targeted product
  - a third-party organization (which then remits to a service provider, City of Seattle or contractor)
- **How high should fees be?**
  - charges sufficient to cover city handling and disposal costs
  - additional funding for city waste reduction and recycling programs; for example, the yellow pages opt-out system run by the city is paid for by a fee charged to publishers
  - a level high enough to encourage consumers to make waste reducing choices
- **What should the revenue be used for?**
  - funding the City of Seattle solid waste system generally
  - specific waste reduction and recycling programs
  - cost recovery for recycling or disposal of specific products
  - cost sharing with retail or other product take-back locations
- **How should recovery or producer charges be administered?**
  - as a City of Seattle solid waste fee independent of rates
  - as part of City of Seattle solid waste rates and charges adopted with rates
  - as regulations requiring retailers to add a charge for a product
  - via producer paid and managed recycling or disposal outside the City of Seattle solid waste system

Other items to address when analyzing potential city product stewardship actions include:

- **Timeline?** Is statewide product stewardship legislation likely only in the distant future? If so, should Seattle:
  - use these strategies in individual cases when the opportunity exists, or
  - formalize a long-term strategy into which near-term actions will fit?
- **One product at a time or groups of products?** Are there administrative or legal advantages to placing recovery fees on multiple products with similar characteristics at the same time? This is in contrast to one-at-a-time legislation that regulates a single product.
- **Are advance fees an efficient cost recovery system?** If advance fees are collected in many venues and remitted to SPU, is it efficient to administer both a system of advance fees and SPU bills? Does the tonnage reduction from an advance fee justify the added cost for all products or just for some? Are there threshold impacts (tons, toxicity, hazardous) that would justify the added administrative cost?

Seattle may develop a strategic framework for product stewardship based on decisions around these choices.

3.2.5 GREEN JOBS

The recent recession has played a role in green jobs development. Because of the downturn, there is increased interest in creating these jobs. Building materials salvage and reuse is an area where SPU is already working with other agencies and businesses to find green jobs.

3.3 CURRENT PROGRAMS AND PRACTICES

The City of Seattle has five major areas of waste prevention programs:

- Reuse
- Sustainable building
- Organics
- Product stewardship
- Other waste prevention activities

The program areas are not always distinct. There is some overlap. For example, reuse includes diversion of salvageable building materials, which is also part of the green building program. These overlaps will be noted as needed.

3.3.1 REUSE

The State of Washington's comprehensive solid waste plan, *Beyond Waste*, established "reduce, reuse, and recycle" as the fundamental principle of waste reduction for solid waste management. Along with messages about reducing consumption, SPU promotes reuse opportunities for households and businesses. For example, SPU often reminds customers to

donate rather than discard used clothing and household items, including electronics. The City of Seattle's own end-of-life policy for electronics mandates donation to schools wherever possible.

City agencies also model best practices with programs for reusing office supplies. Two programs, "Too Good to Toss" (building materials diversion at Seattle's two transfer stations) and market development for industrial byproducts, keep materials from entering the waste stream.

Transfer Stations "Too Good to Toss"

"Too Good to Toss" diverts salvageable building materials, good furniture, and bicycles from loads going into Seattle transfer stations. It is by tonnage SPU's largest reuse activity. SPU began this program at the North Recycling and Disposal Station in 2008 and recovered about 100 tons that year. The program runs on weekends only. SPU expanded it in 2009 to the South Recycling and Disposal Station, though it's currently on hold pending the opening of the rebuilt South Transfer Station. The reusables collectors, all non-profits, provide the diversion service at no cost to SPU.

"Too Good to Toss" grew out of "Use-It-Again, Seattle" neighborhood-exchange events from 2003 to 2006. Those events involved direct costs and required sizable SPU staffing. SPU ended them, although six events in 2003 diverted an estimated 500 tons from disposal. SPU also found that these events provoked illegal dumping. Sometimes items from outside Seattle or the neighborhood were brought in. And some residents offered unwanted household goods for "free" at the curb, outside the program's limits.

Market Development for Reuse

In 2008, SPU expanded its market development for business and industrial waste. That year, SPU joined and began providing financial support for By-Product Synergy Northwest. By-Product Synergy is an association of businesses supported by government and research institutions. It promotes the direct exchange between producers' byproducts and companies that can use them. The program aims to reduce waste and save money for participating manufacturers.

SPU has also partnered with King County in several market development efforts. Recently, funding has dropped for both agencies. However, King County Link-Up, a program to increase markets for recyclables, completed a test of recycled asphalt shingles put in asphalt paving mix. The testing proved to the paving industry that asphalt shingles can be recycled.

3.3.2 SUSTAINABLE BUILDING

The City of Seattle's broad commitment to environmental sustainability includes strategies supporting greener building design, demolition, and construction. Some of these programs seek to increase waste prevention and recycling. Those focusing on waste prevention are described in this section. See Chapter 5, Other Seattle Solid Waste Programs, for detail on our programs to increase construction and demolition (C&D) waste recycling.

LEED Standards

Since 2000, City of Seattle policy requires all new and remodeled city-owned buildings of more than 5,000 square feet to meet the LEED silver standard. LEED is the Leadership in Energy and Environmental Design rating system of the U.S. Green Building Council. Some Seattle buildings have been awarded ratings above silver, either gold or platinum. The LEED system grants rating points for, among other things, recycling of demolition and building construction wastes.

By adopting the LEED standards for its own buildings, the city successfully set an example for private sector development. Seattle has now become a nationwide leader in the number of LEED buildings. By 2010, there were 74 LEED-rated new buildings in Seattle. Because of LEED requirements, in 2008 more than 16,000 tons of C&D wastes were diverted to recycling, according to an SPU consultant study. In the decade from 2000 to 2010, for 47 LEED buildings documented, the total exceeded 100,000 tons according to DPD data. SPU believes that construction to LEED standards also stimulates increased use of salvaged building materials and more efficient use of new materials, though results have not been quantified.

Green Building Team

To promote LEED standards and other energy and material-conservation strategies by the building industry, the City of Seattle created a Green Building Team in 2000. Housed in DPD, the Green Building Team includes experts from SPU and Seattle City Light and is partly supported by those departments. SPU support, primarily from the water and solid waste business areas, has ranged from a high of about $350,000 in 2006 to about $200,000 in 2010. The team's programs include policy development, technical assistance, outreach, and marketing.

In addition to the Green Building Team, SPU has supported a variety of related programs and technical assistance projects. For example, through the Built Green industry organization, SPU offered grants to small multi-family residential builders who achieved high levels of recycling from their jobsites. Early planning is underway for deconstruction and salvage of materials for reuse from the Seattle Housing Authority Yesler Terrace redevelopment.

SPU's public information materials for contractors, produced jointly with King County and DPD, include waste reduction. The King County-Seattle Construction Recycling Directory, published regularly and online, provides worksheets and guidance on how contractors can best recycle and reuse building materials. Through DPD's Green Building Program, SPU also issued a series of remodel guides, including one for salvage and reuse. A series of case studies, on both city and private projects, highlights the costs and benefits of various sustainable building approaches. The studies are available to the public in pamphlet and electronic form.

Salvage and Deconstruction

In the 2004 Plan Amendment, SPU promised to expand technical assistance for waste diversion. In 2007 and 2008, much of this was focused on diverting C&D waste from landfill and upgrading the outcomes for some materials from recycling to reuse. SPU pilot programs supported and gathered data on eight "deconstruction" projects to promote salvage of building materials.

Building Salvage/Deconstruction Pilot Projects

Building salvage is an alternative to conventional demolition. With salvage, a structure is carefully taken apart, saving building elements for reuse. Commonly salvaged materials include structural beams and dimensional lumber, wood flooring, cabinetry, casework and doors, architectural details, brick and stone. Salvage operations can range from selective removal of high-value elements to full-scale deconstruction.

Building salvage can be an important additional service a demolition company can offer clients. More customers are becoming environmentally aware. They want waste reduction on the jobsite and they use green building rating systems such as LEED and Built Green that call for waste reduction, salvage and recycling.

To evaluate the cost-effectiveness and waste diversion potential of differing salvage approaches, SPU and the Washington State Department of Ecology sponsored a series of salvage and deconstruction pilot projects. The results of the pilot projects provided detailed data on the costs and benefits of these approaches, including salvage, deconstruction and house moving. The studies showed that deconstruction increases waste diversion, especially salvage and reuse, compared to demolition or demolition with comingled recycling.

Deconstruction Permit Created and House Moving Promoted

Following the guidance of the *Zero Waste Resolution*, SPU and DPD analyzed re-use and recycling opportunities in the C&D industries. An initial objective was promotion of increased building materials salvage and re-use opportunities.

Early in 2009, the City Council approved a DPD ordinance creating incentives for salvage and deconstruction in lieu of demolition for single-family buildings. The ordinance allows builders committed to salvage and recycling goals to begin deconstruction before a building permit is issued. That timing is in contrast to previous procedures by which the city issued demolition and building permits at the same time. The old procedure left no incentive for careful deconstruction of dwellings and salvage of reusable materials. In 2010, 10 builders used the deconstruction permit. This number is likely to rise when residential construction recovers from the recession.

SPU also conducted a study that identified barriers to house moving. The report suggested changes in city regulatory fees and practices to remove some of the barriers. A parallel study affirmed the value in waste and green house gas reduction when houses are moved rather than destroyed. Moving a single house can divert 40 to 80 tons from landfill and Seattle expects to continue to promote house moving.

Hybrid Deconstruction Program

Hybrid deconstruction is a technique between demolition and deconstruction. Typically, deconstruction is quite labor-intensive. In hybrid deconstruction, elements of the building are cut into panels and then disassembled quickly on the ground. Disassembly can occur at the jobsite or at a specialized yard called a *hybrid deconstruction center*. SPU obtained a 2009 Coordinated Prevention Grant from Ecology to develop a business case for a hybrid deconstruction center in the Seattle area. If a center were developed, it would further lower the cost of deconstruction relative to traditional demolition, and additionally, support green jobs training.

The study showed that such a development was high priced. Setting up a hybrid deconstruction center has become even less possible because of recession-caused drops in SPU funding. SPU plans to continue technical and policy support of existing salvage and deconstruction businesses.

In coming years, SPU's hybrid deconstruction program will include efforts to:

- encourage industry to develop a grading system to facilitate reuse of structural lumber
- promote building material reuse through diversion at SPU's north and south transfer stations

- publicize salvage, deconstruction and house moving policies
- develop a salvage and deconstruction curriculum in connection with green jobs programs

3.3.3 ORGANICS

Organic materials--food and yard waste--present a significant opportunity for waste reduction. SPU has conducted programs in three major areas to divert organics from the waste stream:

- Residential backyard composting (including grasscycling)
- Edible food recovery from grocery stores and restaurants for feeding programs
- "Lean Path" analysis of restaurant kitchen efficiency.

After maximizing onsite waste reduction, SPU focuses on organics collection programs for composting instead of landfilling.

Residential Backyard Food and Yard Waste Composting

Several city activities encourage property owners to manage organic wastes onsite. These include support for the Natural Lawn and Garden Hotline operated by contractor Seattle Tilth Association. SPU also ran programs offering discount compost bins, and continues to offer education publications, and hands-on training for householders and landscape professionals. Some of these projects are partly supported by the Local Hazardous Waste Management Program, and partly funded by a Coordinated Prevention Grant from the Washington State Department of Ecology.

A Seattle and King County program, Northwest Natural Yard Days (NNYD), furthered the onsite organics management message, including grasscycling. NNYD was a partnership with retailers. It offered discounts or rebates on mulching mowers, soaker hoses and other conservation tools for home landscapes. Seattle also collected and recycled home gas mowers as part of the Mayor's Climate Change Initiative. Mower rebates ended in 2008 and NNNYD ended in 2009 after 12 years of operation. However, even with reduced spending and modest outreach, SPU expects residents using natural yard techniques to keep up household organics waste reduction.

Backyard composting by Seattle households peaked between 2000 and 2005. It declined since then because of the City of Seattle's decision to permit vegetative food waste in residential yard waste bins starting 2005. A bigger change occurred at the end of March 2009. As part of the rollout of new collection contracts, SPU required all single-family accounts to have food and yard waste carts. At the same time, SPU added meat and dairy products to the list of products allowed in curbside food and yard waste bins.

SPU also increasingly encouraged residential customers to use curbside food waste service as part of its strategy to meet the Seattle's 60% recycling goal. As a result, the number of households backyard composting declined. In 2000, 46% did backyard composting of yard waste, then 40% in 2005 and down to 30% in 2010, according to a 2010 Home Organics Survey. Backyard composting of food waste showed a similar pattern, declining over the decade from 31% participation to 20%. Faced with this trend and other demands on solid waste revenues, in 2011 the utility ended subsidized sales of backyard compost bins and green cones.

Edible Food Recovery

SPU added the Edible Food Recovery program in 2006. This program helps divert edible food from commercial food businesses to programs that feed the hungry, in two ways. First, food and hospitality industries are encouraged to donate surplus food to hunger-relief agencies. Second, SPU has assisted hunger-relief agencies with grants to fund refrigeration and other equipment (through 2010). The refrigeration equipment has enabled agencies to store perishables longer and thereby distribute more food before it spoils.

Between 2006 and 2010, SPU funded $394,021 for 19 hunger agencies to buy equipment for safe transport, storage, and use of donated food (Table 3-2). Over a 10-year period, this investment should divert nearly 23,000 tons of edible food from the waste stream, at a cost of $29 per ton. At a disposal cost of $53 per ton, over 10 years the investments will yield about $1,216,721 in savings from avoided disposal costs for the utility.

Table 3-2
SPU Food Recovery Investments 2006 – 2010

Year	Agency	Project	SPU investment	Projected 10-yr diversion (in tons)	Value of 10-year diversion	SPU investment (per ton)
2006	Food Lifeline	Walk-in refrig/freezer	$90,000	4,500	$238,500	$20
2007	Food Lifeline	Shoreline facility retrofit	$75,000	4,400	$233,200	$17
2007	Downtown food bank	Refrig equipment	$10,000	205	$10,865	$49
2008	Ballard food bank	Upgrade truck	$9,908	275	$14,575	$36
2008	Food Lifeline	Food recovery equip Seattle's Table	$14,998	NA	NA	NA
2008	Food Lifeline	Waste prevention recycling grant	$14,159	NA	NA	NA
2008	Genesis House	Refrigerator and freezer	$6,057	76.5	$4,055	$79
2008	Hunger Intervention Program	Refrig, freezer, food processing	$13,459	185	$9,805	$73
2008	St Vincent de Paul	Walk-in cooler	$10,000	3,900	$206,700	$3
2008	Union Gospel Mission	Refrig box truck	$25,000	1,438	$76,214	$17
2009	Beacon Ave food bank	Food transport & distribution equip	$1,553	90	$4,770	$17
2009	Community lunch on Capitol Hill	Food storage & process equip	$10,000	274	$14,522	$36
2009	Food bank of St Mary's	Food recovery truck upgrade	$7,108	934	$49,502	$8
2009	North Helpline	Refrig truck purchase	$16,500	1,292	$68,476	$13
2009	Pike Market Senior Center	Refrig equip repair	$10,049	269	$14,257	$37
2009	St Vincent de Paul	Refrig box truck	$15,664	1,761	$93,333	$9
2009	Union Gospel Mission	Purchase commercial freezers	$13,099	2,171	$115,063	$6
2010	Bread of Life Mission	Purchase four freezers	$15,078	288	$15,264	$52
2010	Immanuel Community Services	Upgrade kitchen equipment	$3,710	122	$6,466	$30
2010	Puget Sound Labor	Purchase refrigerator	$3,586	95	$5,035	$38

Year	Agency	Project	SPU investment	Projected 10-yr diversion (in tons)	Value of 10-year diversion	SPU investment (per ton)
	Agency	& coolers				
2010	Rainier Valley Food Bank	Purchase elec pallet jack & refrigerator	$6,583	151	$8,003	$44
2010	University District Food Bank	Purchase freezer & elec scale	$2,910	130	$6,890	$22
2010	Volunteers of America - Greenwood Food Bank	Refrigerate food recovery van	$19,600	400	$21,200	$49
	Total		**$394,021**	**22,957**	**$1,216,695**	**$29**

SPU has also subsidized compostable organics collection costs for these agencies and others. The subsidies helped the agencies cover costs as they switched from garbage collection only, to both garbage and compost collection. When the switch is complete, agencies save money.

The Edible Food Recovery Program is expected to remain extremely important during the economic recession and on into the first years of the period covered by this Plan.

Restaurant and Institutional Kitchen Efficiency

Lean Path, a proprietary kitchen food waste management system, became part of SPU's Onsite Organics program. Lean Path provides technical assistance to commercial kitchens to reduce waste through more efficient food purchasing and preparation.

Under SPU's direction, a consultant recruited and trained three institutional kitchens from 2008 through 2010: Seattle University and Swedish and Northwest hospitals. The three kitchens prevented a yearly combined total of almost 32 tons of food waste, by more closely matching purchases to food actually used. The three sites continue to use this strategy. SPU is interested in promoting this service to restaurants in connection with expanded compost collection. Expanding the program depends on SPU funding.

Single-Use Food Service Packaging

The 2007 *Zero Waste Resolution* instructed SPU to study banning plastic shopping bags and expanded polystyrene (EPS, sometimes called Styrofoam) food service ware. Following a detailed study, Ordinance 122751 banned the use of EPS food service containers, cups, and plates in Seattle. The ban took effect January 1, 2009.

With the ban in place, SPU and its partner Cedar Grove Composting strongly encouraged restaurants to switch to compostable food service products rather than to other plastics. These changes focused restaurant-industry attention on the need for and benefits of commercial food waste collection.

In 2010, SPU performed broad stakeholder outreach and public education to help food businesses meet the second requirement of Ordinance 122751. The ordinance requires all food service businesses to replace one-time-use (throwaway) food service ware and packaging with compostable or recyclable food-ware. With compostable products, people can put leftover food, still in the product, straight into an organics bin, rather than a garbage bin.

SPU estimates that using compostable food service ware at Seattle quick-serve restaurants will divert 6,000 tons of waste per year from the landfill, including 4,500 tons of leftover food. This

figure does not include kitchen wastes or leftover food collected for composting from full-service restaurants.

The program to encourage compostable one-time use products has SPU working with partners to sign up restaurants for food waste compost pickup. By mid-2011, about 2,000 Seattle restaurants were using composting pickup services.

3.3.4 PRODUCT STEWARDSHIP

The City of Seattle supports a product stewardship approach to product end-of-life management. It does so through the Northwest Product Stewardship Council, and through its own studies, legislation, and support for state legislation.

Northwest Product Stewardship Council

SPU is a partner of the Northwest Product Stewardship Council (NWPSC), a coalition of government organizations in Washington and Oregon. The Council is comprised of a 15 member Steering Committee that works with Associate Members to promote product stewardship programs and policies. NWPSC sets regional goals for managing problem materials such as mercury thermostats, paint, fluorescent lighting, chemicals, pharmaceuticals, and electronics. The City of Seattle serves on the NWPSC steering committee. In the past 5 years, NWPSC has done the following:

Legislation

- In 2007, NWPSC members supported passage of the Washington state electronics recycling legislation that created the manufacturer-financed E-Cycle Washington program that offers recycling of computers, monitors, laptops, "tablets," and TVs at no charge to Washington residents, schools, small businesses and non-profit organizations.
- In 2010, NWPSC members supported passage of legislation requiring producers of mercury-containing lighting products to pay for their end-of-life collection and recycling beginning in 2013
- In 2009, 2010, 2011, and 2012 NWPSC members pursued producer responsibility legislation for unwanted leftover medicines (Secure Medicine Return Bill)

Education

- Developed professionally-narrated PowerPoint to inform other agencies and public about product stewardship
- Hosted 2009 national conference of Product Stewardship Institute (PSI) jointly with the North American Hazardous Materials Management Association regional conference in Seattle
- Supported and participated in PSI national dialogues with producers seeking product stewardship (Extended Producer Responsibility or EPR) for mercury-containing lighting products, phone books, and paint
- In 2011, organized a conference on "Product Stewardship Strategies for Local Governments" attended by more than 100 agency and industry professionals

Program Support

- Launched and supported growth of the *Take-It-Back* Network of retailers who, for a fee, take back various electronic products and mercury-containing lighting products
- As a test for secure medicine return, participated in a take-back pilot program in 2006-2011. The *Pharmaceuticals: A Return Mechanism* (PH:ARM) pilot program collected unwanted pharmaceuticals in secure return containers at Bartell's and Group Health pharmacies in several counties beginning in 2007 (Table 3-3.)

Table 3-3
***Pharmaceuticals: A Return Mechanism* Pilot Program**
Pounds Disposed 2007 - 2009

Year	Group Health	Bartell Drugs	Total Pounds
2007	4,226		4,226
2008	12,432	764	13,196
2009	14,206	3,871	18,077
Total	30,864	4,635	35,499

Current Initiatives

SPU's commitment to product stewardship has grown since 2004. During 2009, 2010, and 2011 legislative sessions, we worked with the City of Seattle's Office of Intergovernmental Relations to support a proposed Secure Medicine Return Bill, and a successful bill for Recycling Mercury-Containing Lights (ESSB 5543).

SPU continues to be active on NWPSC committees developing product stewardship legislation for paint, carpet, batteries and various types of packaging. SPU also maintains membership in the Product Stewardship Institute, a national advocacy organization. Through PSI, we participate in national policy dialogues with industry. Current dialogues seek to establish end-of-life responsibility for unused architectural paint and phone books.

Consumer Product Regulations

Waste prevention activities recently focused on certain consumer product initiatives.

Disposable Bags

Following approval of the *Zero Waste Resolution* in July 2007, SPU did an in-depth study of bans or other regulation for disposable shopping bags, and disposable food service ware. The study led the city to propose an advance recovery fee, or "Green Fee," on disposable shopping bags. The Green Fee was to be charged on bags--both plastic and paper—from grocery, convenience, or drug stores. A voter initiative removed the City Council ordinance imposing the Green Fee. In 2011, the council returned to the issue, banning single use plastic carry out bags and requiring a 5-cent fee be charged for large paper bags.

Food Service Ware

The same study suggested a ban on EPS food service ware of all kinds, which the City Council enacted in July 2008. That ban took effect January 1, 2009. Following the ban, substitute materials of all kinds were permitted until July 1, 2010, at which time the ordinance required Seattle food service business to use either compostable or

recyclable products for all one-time-use food service ware and packaging. These "quick serve" businesses range from taco trucks to hospital cafeterias. Promoting, facilitating, and educating the public about this changeover has been a major part of Waste Prevention work in 2010 and 2011. SPU expects a nearly equal effort for several more years. See this chapter's discussion of single-use food service packaging.

Seattle's requirement that all single-use food service products be compostable or recyclable has had a dramatic effect on the food service packaging industry. The number of compostable products available to restaurants leaped from 70 to more than 700 in barely 2 years. The city expects that with full implementation by the end of 2012, the food service packaging regulations will divert 6,000 tons of packaging and leftover food from landfill.

Junk Mail and Yellow Pages Phone Books

Following City Council instruction, SPU looked into the problems of unwanted advertising (junk) mail and unwanted yellow pages phone books in 2010. Phone book companies often deliver yellow pages books to homes and businesses who do not want them. This work led the City Council to pass Ordinance 123427 in October 2010, authorizing SPU to set up a yellow pages opt-out registry. The registry would track incorrect deliveries. The ordinance levied a per-book charge on publishers' deliveries to reimburse SPU costs for running the registry. There was also a tonnage charge on yellow pages books to compensate SPU and, indirectly, ratepayers, for the costs of recycling and disposal.

Subsequently, yellow pages publishers sued the City of Seattle to overturn the ordinance and the City Council repealed the tonnage charge in the face of that suit. Court action on the legality of the opt-out registry fee was pending in spring of 2012.

Nevertheless, SPU engaged a contractor to manage the online yellow pages opt-out registry, and to offer a separate junk mail opt-out service linked from SPU's website. The yellow pages phone book and junk mail services both launched in May 2011. Yellow pages phone books opt-outs quickly soared to an annual rate of 300 tons of paper saved. At the same time, a federal judge denied yellow pages publishers' requests for injunctions to stop the yellow pages opt-out service. Since the junk mail service was not part of the lawsuit it will continue regardless of the court's decision on yellow pages. From the junk mail opt-out service, SPU expects to obtain data on the number of opt-out requests and the amount of paper saved.

Additional Product Studies

SPU also studied eight other problem products. The products were selected because they are recyclable materials appearing in relatively large volumes in the waste stream. Or they are toxic to some degree, making them difficult to recycle. The aim of the study was to determine strategies for increased recycling of these products. The products included carpet, plastic film from commercial sources, treated wood, mercury-containing lighting products, medical sharps, non-automotive batteries, expanded polystyrene block foam and textiles. The study focused on market development and product stewardship opportunities. Further study of additional problem products depends on the growth of solid waste funding.

The eight products already studied (Phase I) and the approximate order of further study and action are shown on Table 3-4.

Table 3-4
Planned Evaluation Schedule for Problem Products and Packaging in Seattle

	Product or Packaging	Disposed 2004 (tons estimate)	Possible Action
Phase I (Current Study)	Treated wood waste	13,600	No change
	Medical sharps		Possible state legislation
	Carpet	14,000	Possible state legislation; local take-back established
	Plastic film (commercial applications)	16,000	Collection program end 2011
	Fluorescent lamps	50	State action in 2010
	EPS block foam and void fill packaging	1,100	Possible program 2012
	Batteries	200	No action
	Textiles	7,600	No action
Phase II	PVC clamshell/blister packaging (non-food)	400	No action; see NWPSC packaging report 2011
	Single-use plastic beverage containers	1,600	Covered in NWPSC packaging report 2011
	Paint (oil-based & latex) and aero cans	(paint) 660 (aero cans) 420	Awaiting state legislation planned for 2012
	Telephone books (yellow pages)	260	Opt-Out Registry approved 2010; recovery fee proposed, then dropped
	Plastic film (consumer packaging)	4,650	Covered in NWPSC packaging report 2011
Phase III	Tires	210	No action
	Small appliances	1,125	No action
	Plastic food packaging & Other plastics	20,000 (excludes bottles, jars, film)	Single-use food packaging regulated in 2010
	Household metals	5,500	Most in curbside 2009
Continue under Existing Efforts	General purpose polystyrene food containers	120	Banned 2009
	Paperboard Corrugated cardboard (OCC)	21,500	Continue existing efforts
	Pallets/crates - "urban wood"	37,000 (excludes treated wood)	
	Pesticides and fertilizers	100	
	Spent antifreeze		
	Household cleaning agents	230	
	Mercury-containing equip & thermostats		Work through NWPSC for state action
	Products containing bisphenol A (BPA)		Likely to require state action
	Products containing phthalates		
	Lead in jewelry & children's products		
	Brominated fire retardants		
	Metals in product packaging		
	Pharmaceutical waste		Secure Medicine Return Bill 2008-2012
	Radioactive devices		Likely to require state action
	Cellular phones		Through NWPSC add to Electronic Product

Product or Packaging		Disposed 2004 (tons estimate)	Possible Action
			Recycling Law as possible
	Computers and computer monitors	1,300	Continue current programs
	VCRs, stereos, televisions	2,600	Add to Electronic Product Recycling Law where needed
	Major appliances		
	Used motor oil	(includes diesel) 52	Motor oil added to curbside in 2009
	Lead-acid automotive batteries	130	Support current take-back system

EPS = expanded polystyrene; MTBE = methyl tert-butyl ether; OCC = old corrugated cardboard; PVC = polyvinyl chloride
Source: "Revised 60% Projections, March 24, 2006 Update," SPU staff.

E-Cycle Washington

The statewide E-Cycle Washington product stewardship program began in 2007. SPU signed up with the operating agency, the Washington Materials Management and Financing Authority, as a collector. SPU offers curbside collection of the five products covered by the E-Cycle Washington program (computers and laptops, monitors, tablets, and television sets) and other electronic products for $20 per pickup. Customers call in to arrange collection.

E-Cycle Washington's convenient drop-off sites throughout the city explain why SPU's electronic waste curbside service received little use (approximately 1,000 calls per year) in 2009 and 2010.

All electronics collected at curbside or otherwise entering the city's MSW system are delivered for processing to facilities that meet or exceed the standards of the Basel Action Network (BAN) Electronics Recyclers Pledge of True Stewardship and Washington Department of Ecology's Environmentally Sound Management and Performance Standards for Direct Processors. The City Council is considering upgrading to the more rigorous BAN e-Stewards standards in the near future.

The City of Seattle donates its own surplussed workable computers as needed to Seattle Public Schools and other non-profits, with the remainder sold to the public. In 2010, almost 90 percent of more than 2,000 surplussed computers were donated. Unworkable electronics products are disposed under a contract requiring the company to meet the same BAN standards as referenced in the previous paragraph, or a similar declaration acceptable to the state.

3.3.5 OTHER WASTE PREVENTION ACTIVITIES

Waste prevention strategies are typically determined by the products or materials targeted. For example, office paper, which is easily recycled, is often carelessly overused. Carpet, which contains high-value plastic fibers, is heavy to ship and reprocessing plants are thousands of miles away. For these and other products, such varying barriers to effective recycling lead to different strategies, a number of which are noted here.

Market Development

A major program within waste prevention is market development for typically hard-to-recycle materials. Currently, chief among those products is carpet. SPU staff work has greatly increased the likelihood that new carpet recovery facilities will locate in the Seattle area. With King County, SPU has supported research leading to the use of recycled asphalt shingles in hot mix asphalt. Work is under way with private-sector haulers to collect plastic film from commercial

and industrial sources. Two other products are under consideration: gypsum wallboard and urban wood chips for pulp. However, action on these products needs to wait on the availability of funding.

Green Purchasing

"Green purchasing" approaches reduce the environmental impact of the whole range of products and materials purchased by the City of Seattle. City purchasing incorporates requirements based on Seattle Municipal Code to buy products with recycled content, that are less toxic, and that are recyclable and re-usable. Green purchasing policies and ordinances, including SMC 20.60.200, are available online.

Future green purchasing will emphasize two things: less packaging and aggressive controls on purchased chemicals. Less packaging prevents waste, and lower levels or absence of toxic chemicals will reduce exposures for staff and visitors to city facilities.

Paper Cuts

The Paper Cuts program was created in 2004 to show that the City of Seattle could walk its talk on waste reduction. At the end of 2009, this program came to a close with institutional changes solidly in place and a 28% overall reduction in reams of office paper purchased. Over the 5 years of this campaign, the city saved nearly 150,000 reams of paper, weighing nearly 350 tons (400 reams =1 ton). In 2009, this reduction saved $44,000 in paper purchasing costs.

In addition, current customer enrollment in SPU's paperless billing will save 524,880 sheets of paper and 349,920 envelopes each year, an amount equal to 4.4 tons of paper and 112 trees.

Waste Prevention and Recycling Matching Grants

In 2008, the City of Seattle established the Waste Prevention and Recycling Matching Fund, a community grant program. This program was another action called for by the *Zero Waste Resolution*. The purpose of the program is to support projects initiated by the community. The projects were to prevent waste generation, increase reuse, and increase recycling and composting. Data collected from the projects is used to develop effective models and strategies to share with residents and businesses.

In 2008 and 2009, the matching fund program received 50 applications requesting about $900,000 in all. SPU awarded $200,000 in matching funds to 17 projects. The projects included food recovery, school composting and recycling, commercial waste reduction, materials reuse, multi-family composting and recycling, and sustainable landscaping.

Exceeding expectations, the matching fund projects diverted more than 1,900 tons of waste and educated nearly 10,000 people about waste prevention, recycling and composting.

Community Benefits from 2008 – 2009 Grants

- Involved over 500 volunteers who contributed more than 2,500 hours of time to grant projects
- Offered low or no-cost resources to low-income communities, including computers, bikes and up to 222 tons of edible food
- Created 6 new temporary positions funded by the grant
- Provided green job skills training for youth and low-income community members
- Provided service equity to immigrant and refugee communities and low-income communities
- Helped youth develop leadership skills
- Built and strengthened community networks

SPU was unable to fund the Waste Prevention and Recycling Matching Fund in 2010. The program was restored for 2011 with a focus on schools. Meanwhile, knowledge gained from 2008 to 2009 guided three other SPU programs in 2010:

1. **Increased Composting and Recycling in Schools.** Public and private school interest in the grant program convinced SPU to offer small grants from a $20,000 budget to maintain program momentum. This expanded dramatically thanks to restoration of the full $100,000 for grants in 2011. The schools requested help starting programs to separate lunchroom compostables (food waste and compostable food service packaging) for organics collection. As a result, the matching grant program for 2011 and 2012 was redesigned to provide significant assistance to Seattle Public Schools, in hopes such programs could be jump-started throughout the district.
2. **Outreach to Immigrant Communities.** SPU will continue partnering with community-based organizations to expand waste prevention and recycling outreach to immigrant and refugee businesses.
3. **Food Recovery.** Significant interest in food recovery will continue to be served through the Food Recovery Infrastructure Grants Program. This program previously ran concurrently with the Waste Prevention and Recycling Matching Fund.

Outreach to Businesses

Reaching businesses with resource conservation and waste prevention programs has always been more difficult than communication with residents. For residents the goal is usually modest and uniform behavior changes spread across a large population. And it's easier to reach the person in charge of waste management in the home. In contrast, increasing conservation, waste prevention and recycling in the commercial sector often requires a much greater level of contact, information and persistence. The payoff can be large, but often business processes--and sometimes just habits--must be changed.

For the past 15 years, SPU has used a contractor to provide the "Resource Venture" program. Resource Venture services include technical assistance and promoting resource conservation in the commercial sector. The consultant approach allowed focus to vary over time and include a full range of SPU line-of-business outreach goals. Resource Venture services provide businesses with a range of suggestions from water conservation and office paper recycling and two-sided printing to green purchasing. Recently, Resource Venture has worked with quick-serve restaurants, to promote compostable food service ware as a replacement for one-time-use, throwaway products.

3.4 ALTERNATIVES AND RECOMMENDATIONS

SPU plays a vital role in reducing the city's impact and moving the community toward sustainability. In that context, waste prevention will continue to play a key role. Actions that SPU will take are described here.

3.4.1 REUSE

SPU will continue to expand broad-themed public education about product and materials reuse and implement programs to remove barriers to those activities. The city has taken a programmatic interest in several areas of materials reuse:

- Transfer station waste prevention
- Charitable donations
- Industrial materials reuse
- Electronic products reuse and expansion of covered products in the E-Cycle Washington program
- Building deconstruction and salvage

Transfer Station Waste Prevention "Too Good To Toss"

SPU will continue diverting materials for reuse at the transfer stations. Private contractors could continue to provide this service, or city transfer station staff could take it over. Pre-scale drop boxes maintained by various charities can also be part of the program. To increase building material salvage and recycling, loads of C&D wastes can be redirected to approved processing facilities.

Recommendations

- Continue, at least until the rebuilt transfer stations come on line, using contractors to divert reusable building materials and household items (such as furniture in good condition) from residents bringing loads to the transfer stations.
- Encourage charities to locate drop boxes or maintain open drop-off trailers either onsite (Bike Works) or nearby, as has been done over the past several years
- Develop educational materials for contractors now bringing C&D loads to Seattle's north and south transfer stations. The education pieces will direct them to source-separated drop-off services as well as processors of C&D loads of mixed recyclables. See Chapter 5, Other Seattle Waste Programs, section 5.1 for more detail on C&D. These transfer facility recommendations are also briefly referenced in Chapter 4, Seattle's MSW System, section 4.4.4.

Charitable Donations

The recession continuing into 2011 has spotlighted the need for low-cost household goods and clothing. Increasing diversion of usable items will reduce waste as well as help fill that need.

Recommendations

- Collaborate with charities and others to continue to find ways to divert usable items and materials before they are dumped at SPU transfer stations
- Continue to support City of Seattle policies requiring donations of usable electronic equipment to schools

- Promote private donation of electronic products to organizations that refurbish them for reuse

Industrial Materials Reuse

Some byproduct exchanges are easy to put in place. Others require some level of processing to create salable commodities. SPU can find ways to stimulate such exchanges and encourage market development for various commodities.

Recommendation

- Continue involvement and support for industrial commodity exchange programs, focusing on market development for recycled commodities as needed

Electronic Products Reuse, Expansion of Covered Products

SPU actions range from support of the E-Cycle Washington program, to efforts through the Northwest Product Stewardship Council (NWPSC) to expand the law's coverage to other electronic products, and to ensuring the highest standards for electronics disposal.

Recommendations

- Continue to promote donation of these and other electronic products to companies that can make sure they are operable. Such companies then resell them to the public or donate them to schools and others through appropriate non-profit organizations.
- Work with the NWPSC and the City of Seattle's Office of Intergovernmental Relations to expand the Electronic Product Recycling Law to cover more types of products such as printers, other computer peripherals, compact disc players, and the like.
- Continue to ensure that electronics disposal meets or exceeds the standards of the Basel Action Network (BAN) Electronics Recycler's Pledge of True Stewardship, Washington Department of Ecology's Environmentally Sound Management and performance Standards for Direct Processors, and the upgraded BAN e-Stewards standards as may be adopted by the Seattle City Council in the near future.
- Upgrade the electronics disposal standards in Seattle's surplus electronics contract to the new BAN e-Stewards standards when the city renews the contract in 2014.

3.4.2 SUSTAINABLE BUILDING

Seattle's Sustainable Building Policy is an integral part of the city's move toward sustainability. As time goes on, LEED and similar national standards are likely to become increasingly specific, encouraging more waste prevention and recycling. DPD is a vital partner in furthering sustainable building practices.

Recommendation

- Continue to work with the DPD to maximize reuse of materials and recycling of wastes, including new regulations mandating recycling of most C&D-generated materials

See Chapter 5, Other Seattle Solid Waste Programs, for detail on C&D wastes.

Building Deconstruction and Salvage

Recommendations for building deconstruction and salvage build on and augment past activities.

Recommendations

- Continue to support changes in City of Seattle building codes that provide incentives for salvage and deconstruction. Continue to support U.S. Green Building Council (LEED) and other standards that emphasize the reuse of materials
- Promote grading standards development for salvaged structural (dimension) lumber in order to expand the market for it (the highest value material salvageable from building deconstruction per SPU's 2010 Hybrid Deconstruction Center study). The lack of a grading system accepted by state and local building codes is the critical barrier to increasing reuse of structural lumber. A market for salvaged dimension lumber will increase revenue from deconstruction and stimulate owner and contractor participation and, thereby, total tons salvaged. Further, because the market for architectural elements can be influenced by trends in architectural style and likely is limited, marketing salvaged dimension lumber is the growth area for building salvage.
- Promote house moving. House moving is the ultimate reuse since the home remains almost entirely as is. During the period of this plan, SPU will continue to aggressively promote house moving and work with other city agencies to remove permit barriers to this activity.

3.4.3 ORGANICS

Several onsite organics programs have reached maturity. Diversion resulting from these programs is flat or declining. In the next 5-year period, SPU expects the trend to continue.

Residential Backyard Food and Yard Waste Composting

Even though residential organics service and use has increased, onsite organics management is still the preferred way to manage these materials.

Recommendations

- Continue to promote backyard composting of food scraps and landscape waste
- Continue to promote grasscycling. Grasscycling retains valuable nutrients on lawns and helps build soil. Healthy lawns and soils enhance storm water retention and reduce irrigation. Grasscycling also reduces hauling of heavy green organics, and reduces seasonal overloading of compost facilities with wet, high nitrogen clippings. Overloading with grass clippings can promote anaerobic breakdown and result in odor problems at composting facilities.

Edible Food Recovery

When grocery stores and restaurants donate food to feeding programs, they reduce waste. Even less food is wasted when food banks and feeding organizations operate more efficiently (thanks

to expanded refrigeration). And when these agencies also shift from garbage disposal to compost collection, they increase organics diversion from landfill.

Recommendations

- Continue promoting retail and restaurant donations to food banks and feeding programs
- Continue working with food banks to minimize their disposal costs through shifts from garbage to compost pickups

Restaurant and Institutional Kitchen Efficiency

Greater efficiency in food purchasing and preparation can lead to less food waste for Seattle and less cost to businesses. See the Lean Path program description in section 3.3.2.

Recommendations

- Continue promoting food purchasing and preparation efficiency as a complement to programs designed to increase commercial food waste composting
- Offer consulting services to help restaurants and institutional kitchens buy and serve food with less waste as funding permits

Single-Use Food Service Ware Regulation

The overall goal of this program is to reduce, if not entirely remove, restaurant-generated organic materials from landfill disposal, thus reducing waste and green house gas generation.

Recommendations

- Continue to press the quick-serve restaurant industry, food courts, and institutional food service businesses (such as hospitals and schools) to use primarily compostable single-use food service products
- Work to ensure that proper containers are used in public areas of quick-serve restaurants and other food service businesses where single-use service ware is discarded
- Work with food service businesses to ensure that they have collection contracts so materials are picked up and sent for proper processing
- Provide extensive public education to support these programs
- Fund sufficient outreach staff or consultant services to promote continued and growing compliance with the single-use food packaging regulations

3.4.4 PRODUCT STEWARDSHIP

Product stewardship recommendations target areas where the City can act on its own, regionally or through state legislation to obtain producer responsibility for source reduction (redesign), reuse, recycling - including design for recycling - of various products. The alternatives facing SPU in product stewardship involve two decisions. First is which product to focus on.

Second is whether the effort should be statewide, regional, or endeavors Seattle undertakes as a leader in the field.

SPU should encourage and act to guide consumer choices and redesign of products that minimize waste and associated environmental impacts, moving toward a City of Seattle solid waste system that:

1. Shifts as much solid waste system cost as practicable from city rates to product cost-internalized systems or recovery fees paid by product producers
2. Charges consumers upfront (internalized in the cost of products) for disposal of certain products that either contribute significant tons to the city's solid waste system or cause environmental problems during disposal
3. Encourages continuation and expansion of producer take-back services for problem products (such as electronics) that are handled primarily outside of the city system
4. Continues to provide services and set rates to encourage customers to minimize garbage and reduce use of products that end up as solid waste

Recommendations

- Develop a strategic framework for product stewardship actions. Define what Seattle can accomplish acting either alone or in partnership with other local jurisdictions. Define which products and materials can only be successfully regulated through state legislation.
- Continue work with Northwest Product Stewardship Council (NWPSC), Local Hazardous Waste Management Program (LHWMP), and others to increase the range and effectiveness of product stewardship at the state level
- Continue support for proposed state legislation regarding return of unwanted, leftover pharmaceuticals, medical sharps and carpet
- Monitor and support the development of plans for producer-paid end-of-life management for mercury-containing lighting products resulting from 2010 state legislation
- Work with partners to determine the best strategies and timing for new state legislation covering products such as latex and oil-based paint
- Support the NWPSC dialog regarding product stewardship for packaging and printed paper
- Support expanding the Electronic Product Recycling Law to include a greater variety of electronic products
- Continue support for the Product Stewardship Institute and the national product dialogs the institute supports
- Pursue local legislation (which may include retail take-back) where regional or state action is not forthcoming. Examples of products that may be regulated or have been regulated locally include single-use food service ware, shopping bags, and yellow pages phone books

- Stay abreast of national developments as product stewardship moves from management of products notable for their toxic content (electronics, mercury-containing lighting, pharmaceuticals) toward producer responsibility for many of the products and types of materials such as packaging found in Seattle's curbside collection program
- Continue attention to material reuse and recovery rates under product stewardship programs and evaluate support for future programs based at least in part on their recovery rates compared to existing programs such as curbside
- Emphasize the economic development (job creation) potential of product stewardship programs

3.4.5 OTHER WASTE PREVENTION ACTIVITIES

Many waste prevention strategies can be applied directly to existing day-to-day activities of businesses, public agencies and individuals. Expansion of these programs will require steady work and public education over the long run.

Green Purchasing

City of Seattle purchasing guidelines call for the use of green products and practices. In the future, purchasing professionals should provide a Green Knowledge Bank for other purchasing agents, leading to inter-agency collaboration on green purchasing solicitations.

Recommendations

- Push City of Seattle departments toward additional green purchasing decisions in facilities construction
- Work for guidelines requiring more recycling and recycled-content provisions in "standard" specifications for all work in the public rights-of-way
- Seek packaging-waste reduction and more aggressive controls on chemicals acquisition to reduce toxics exposures for staff and visitors to city facilities
- Contribute to standards setting for "ecolabels" and suppliers—from green office supplies to green fleets
- Incorporate end-of-life management and product stewardship into purchasing
- See that Seattle continues its role as a resource for both businesses that are utility customers and other government agencies

Paper Cuts

Office paper use reduction is well established in City of Seattle government. Opportunities exist to make this a model program that private businesses of all sizes can use.

Recommendation

- Continue to include Paper Cuts as a part of outreach to businesses whenever possible

Waste Prevention and Recycling Matching Grants

This program has proved to be very attractive to schools, both public and private. The program's success is described in this chapter.

Recommendation

- For the first part of the plan period, focus grant monies on schools, working with school district administration and private school managements, to establish system-wide approaches to school food and yard waste collection.

By mid-2013, SPU expects nearly all public and private schools in Seattle will have recycling and compost diversion programs and collection services. At that point, the grant program can expand to other types of generators and community programs.

Junk Mail, Catalogs and Phone Books

A variety of regulatory and program options are available to reduce the tonnage of junk mail, catalogs and unwanted phone books.

Recommendations

- Continue the online junk mail opt-out service established in early 2011. The service will sustain a single, visible link from City of Seattle web pages that residents and businesses can use at no cost to opt-out of junk and catalog mail, possibly including yellow pages phone books. Monitor service provider estimates of tonnage of paper saved based on the number of opt-outs made and report to Council.
- Given a favorable decision in the yellow pages publishers' lawsuit seeking to block the Phone Books Opt-Out Registry, strongly promote this service as a way to quickly reduce paper use.
- SPU will work with the phone companies and phone book publishers to change Washington Utilities Commission regulations that require delivery of "white pages" phone books. Much less paper would be used if the books were only printed for those who affirm that they need them.

3.5 MEASUREMENT

Measuring waste prevention is often difficult or impossible because data on what does not happen are frequently not available. This is particularly true when residents and businesses, responding to SPU messages, stop or reduce purchases. "Waste Free Holidays" where SPU and King County have combined to suggest that gifts be activities instead of "stuff" is a typical example. How much is not purchased and the amount of wrapping and packaging not generated cannot be determined. Wherever possible, however, SPU seeks to quantify results. The areas where data can be obtained are detailed below.

3.5.1 REUSE

SPU's disparate reuse programs require measurement methods tailored to the needs of the programs and their various materials.

Transfer Station Diversion

As a condition of their contracts or memoranda of agreement (MOAs), SPU collects data from the companies diverting building materials and useable household goods from the vehicles entering the north and south transfer stations.

Industrial Materials Reuse

SPU has not been able to measure industrial materials reuse in the past. Participating with By-Product Synergy Northwest and other agencies, SPU will work to collect data about industrial materials reuse, including such sources as the IMEX on-line materials exchange program.

Electronic Products Recycling and Reuse

E-Cycle Washington provides statewide data on electronics recycling broken down by county. SPU receives these reports and can estimate the volume of Seattle-origin diversion. The City will continue to promote both reuse of still-workable products and proper disposal at end-of-life.

3.5.2 SUSTAINABLE BUILDING

Waste prevention sustainable building activities center around building deconstruction and salvage, to increase C&D reuse and recycling. SPU plans to track data from:

- DPD deconstruction permits
- Salvage tonnage reported as recycling by company members of the Northwest Building Salvage Network and similar businesses
- Number of houses moved in the city annually

3.5.3 ORGANICS

SPU measures organics management at Seattle's homes indirectly through surveys. Data collection can be built into commercial kitchen programs.

Residential Backyard Composting and Grasscycling

Estimates can be generated for backyard food and yard waste composting and grasscycling from data on the number of participating households. These data are obtained by survey every 5 years.

Restaurant and Institutional Kitchen Efficiency

Waste reduction data from this source are dependent on SPU contracting with an organization such as Lean Path. Lean Path assists food service businesses in cost-reduction through purchasing and food-portion management. If funds are available, SPU plans to provide this kind of technical assistance again.

Single-Use Food Packaging Regulation

For compostable or recyclable single-use food service packaging, SPU will develop methods to estimate progress. It is very difficult to obtain data from all the city's food service businesses as to how many are using what types of food packaging.

It is very difficult to separate the effect of organics outreach to the commercial sector related to food packaging regulation. The amount of material diverted is not separately measured. In these cases, it appears in aggregate reports from collectors and the city's compost processor.

3.5.4 PRODUCT STEWARDSHIP

Once established, product stewardship programs provide excellent data on the amount of recycling that occurs, a measure of diversion, not prevention. SPU will collect data on recycling of products that fall under product stewardship regulatory legislation. It is not possible to predict which products will be recycled thanks to future product stewardship legislation, but here are some examples:

- Electronic products
- Pharmaceuticals (currently a pilot program)
- Mercury-containing lighting
- Carpet
- Paint
- Medical sharps
- Rechargeable batteries
- Packaging

3.5.5 OTHER WASTE PREVENTION ACTIVITIES

SPU contracts out commercial paper reduction, and junk mail, and yellow pages opt-out programs and requires regular data reporting. And as the city continues strong internal support for its green purchasing program, staff regularly compiles performance data.

Green Purchasing

Working with the City of Seattle's Department of Finance and Administrative Services, SPU tracks the changes in purchasing from toxic or damaging products to less toxic or benign alternatives.

Paper Cuts

Data from the city's internal paper reduction program are checked annually. Data can also be obtained from the consultant that provides Resource Venture services. Resource Venture provides outreach to businesses on conservation, recycling, and waste prevention.

Waste Prevention and Recycling Matching Grants - School Food Waste

Through SPU's grants to schools, we will track the number of participating schools. The schools will provide SPU with information on numbers of compost collection container numbers, container sizes, and when or if they downsize garbage service.

Junk Mail, Catalogs and Phone Books

Paper-use reduction from resident and business opt-outs from junk mail and catalog mailing lists, and from phone book delivery, can be measured from two sources.

- SPU will get the tonnage of paper saved from the contract vendor providing the junk mail opt-out services. The services are directly accessed from the City of Seattle's web pages. The vendor can track Seattle-origin opt-outs, and using postal service algorithms then report tonnage.
- Pending the outcome of a lawsuit in 2011, a similar service for yellow pages phone book opt-outs will be able to provide the tonnage of yellow pages phone books not delivered.

3.5.6 OVERALL GENERATION

One way to gauge waste prevention effectiveness is to look at the city's total generation rates, for both garbage and recycling. SPU tracks total generation annually, as can be seen in Figure 2-1 in Chapter 2. It is difficult to sort out all the different causes embedded in the trends, which have generally followed economic cycles. Nonetheless, we can use this data with the other measurement techniques discussed above to monitor overall waste reduction progress.

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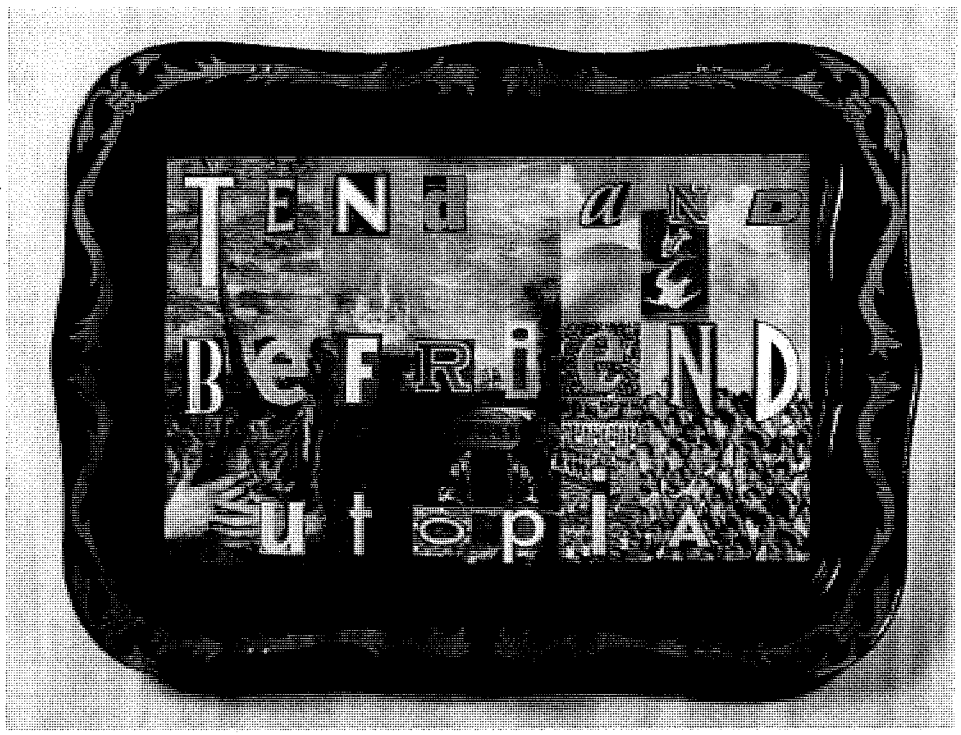


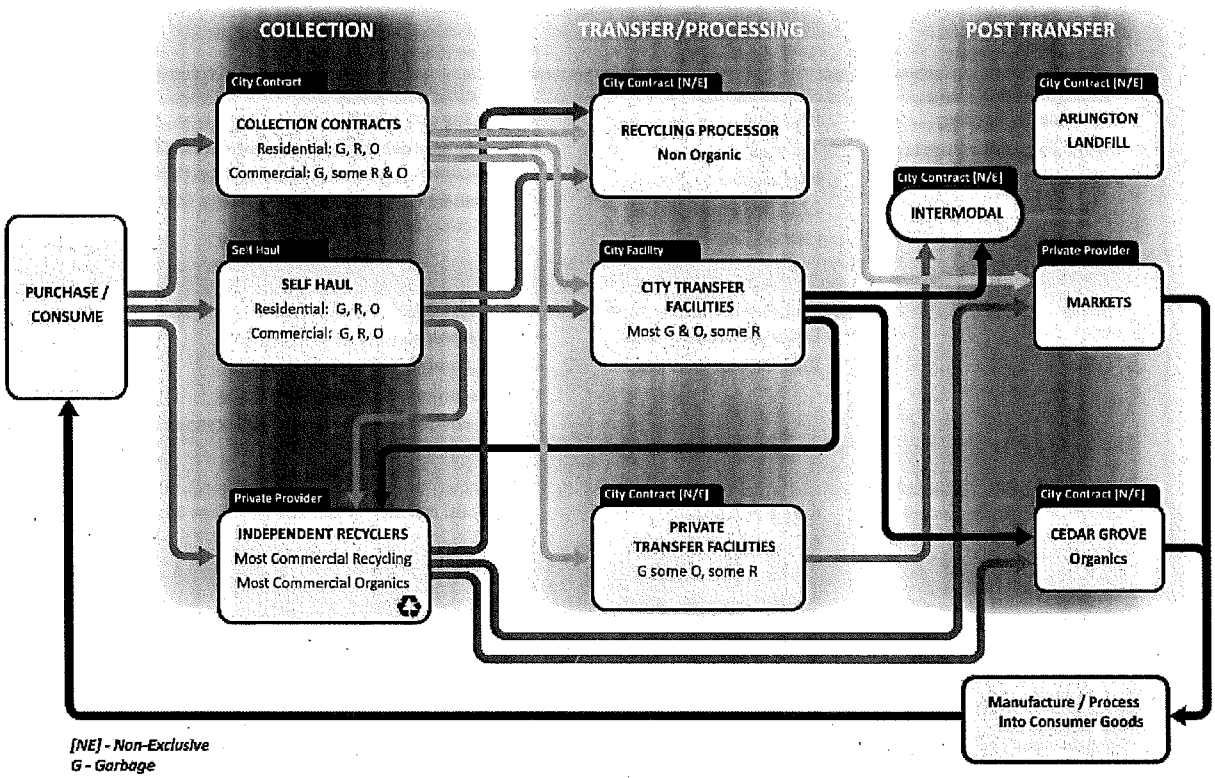
Chapter 4 SEATTLE'S MSW SYSTEM: MANAGING DISCARDS

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



[NE] - Non-Exclusive
G - Garbage
R - Recycle
O - Organics (food & yard)

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.

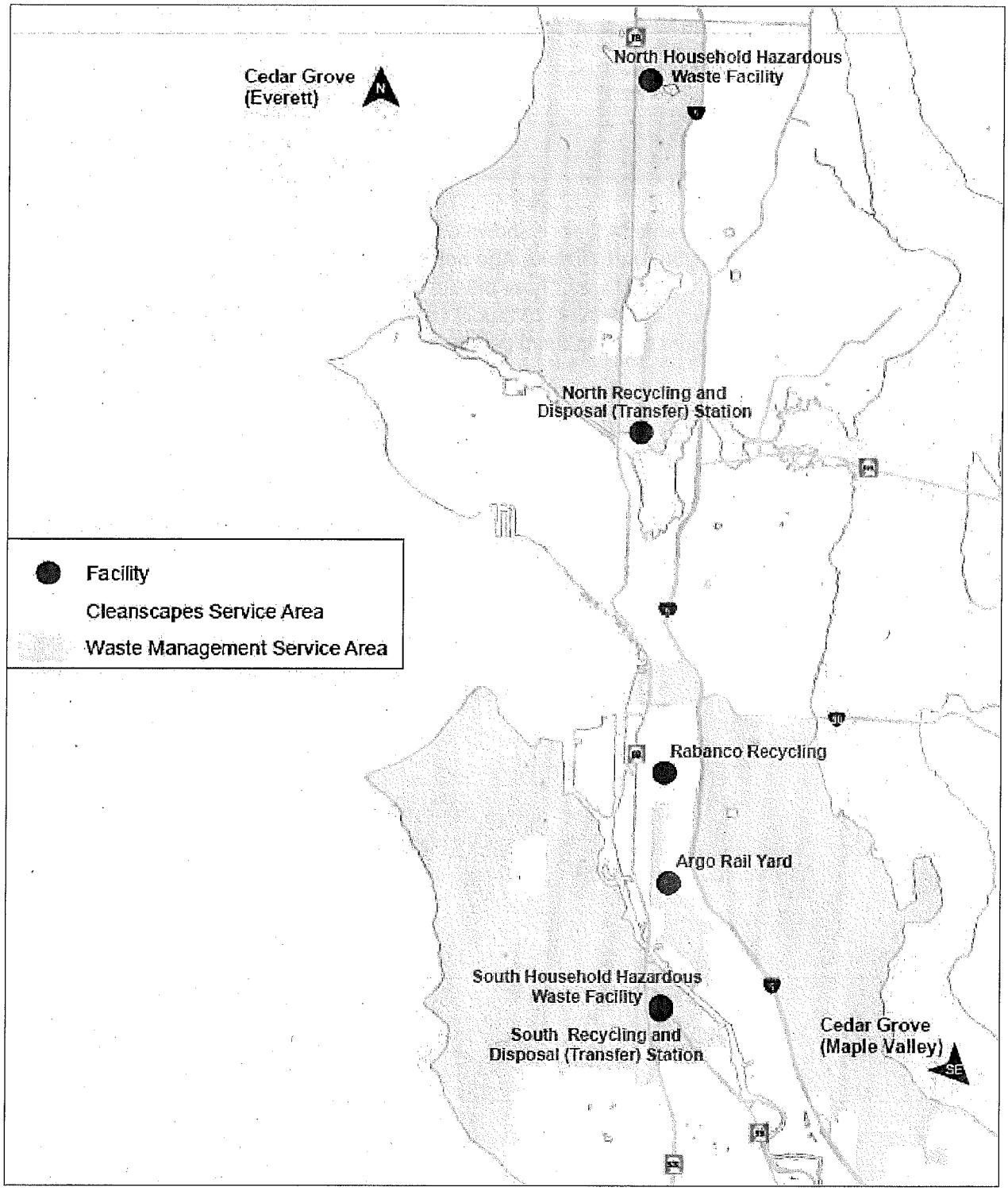
Table 4-1
Inventory of City of Seattle Solid Waste Facilities

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 facility
SPU	South Household Hazardous Waste Facility 8100 2nd Ave S	Moderate risk waste facility
Seattle City Light	3613 4th Ave S	Moderate risk waste 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	Bio Medical 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	Construction and demolition 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
Privately Owned Facilities Outside Seattle Relevant to Seattle System		
Cedar Grove	Composting A)17825 Cedar Grove Rd SE	Organics composting

Operator	Facility/Location	Type
	Maple Valley, WA 98038 B)3620 36th Pl NE Everett , WA 98205	
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 at which SPU can most influence customer decisions and behaviors.

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

Table 4-2
Collection Recommendations from 1998 SWP and 2004 Amendment

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 reduces 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 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.

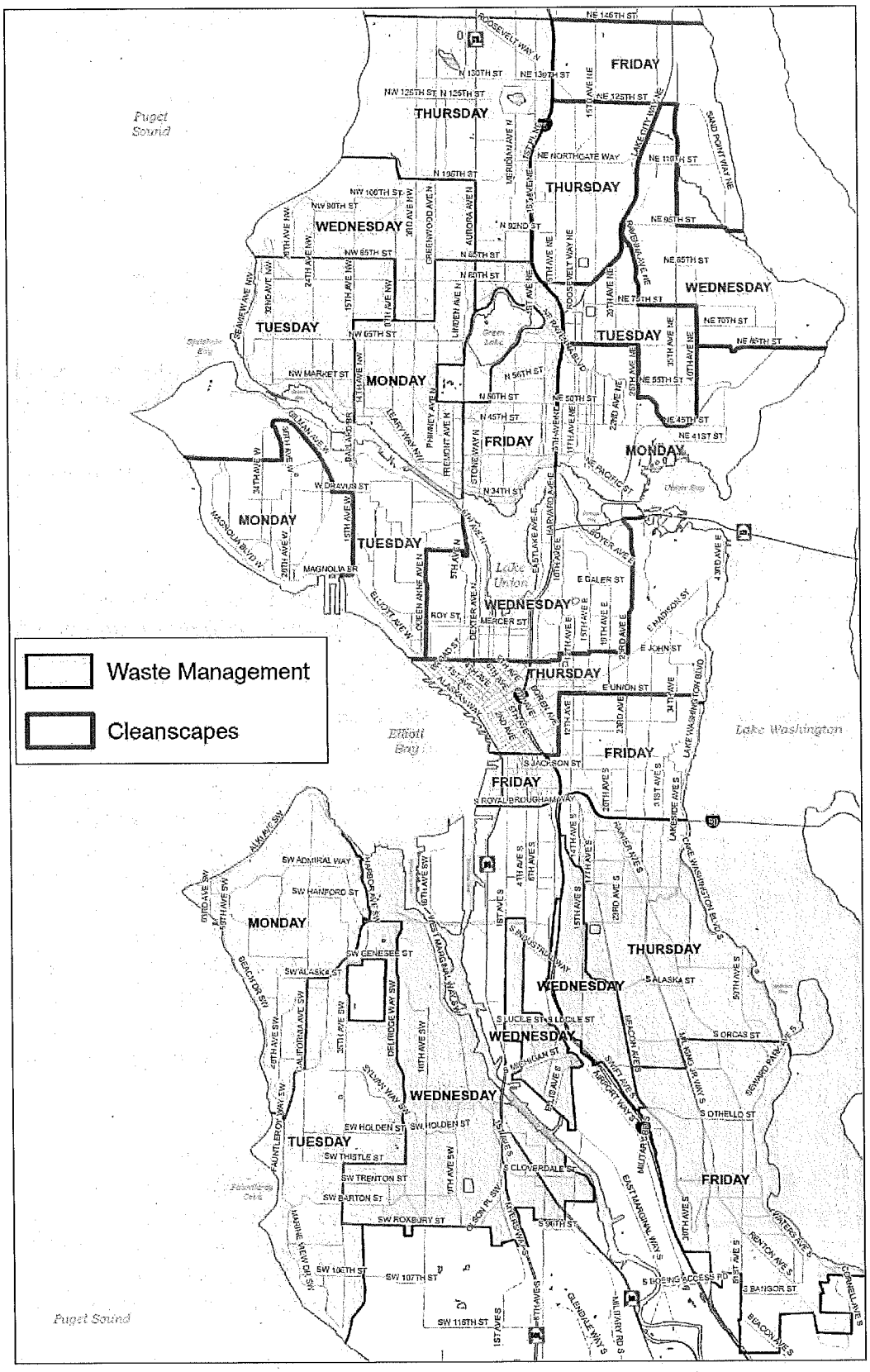
Customer Service

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).

Figure 4-3
MSW Collection Service Areas by Vendor



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.

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 becomes a requirement. Again, building needs determine containers 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 will ban 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, materials, etc. 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 on line, etc.)

4.2.4 Collection Alternatives and Recommendations

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

Collection System Recommendations

The following section describes recommendations for the collection stage of SPU's MSW system structure.

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. Should it be needed for trouble shooting, more detailed miss data are gathered and maintained, including address, collector, etc.

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

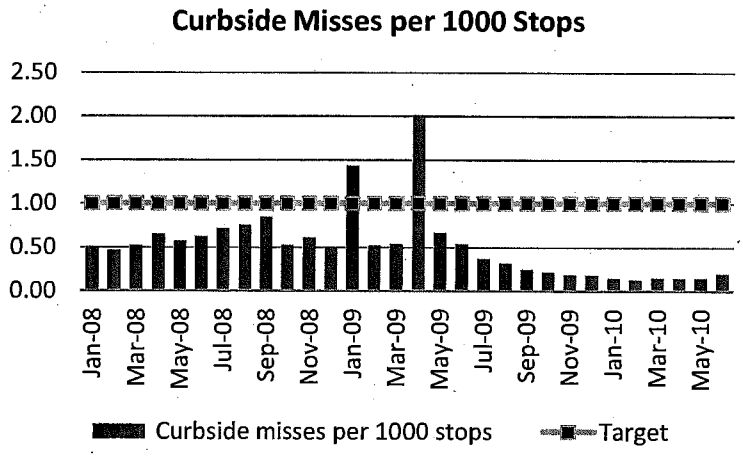
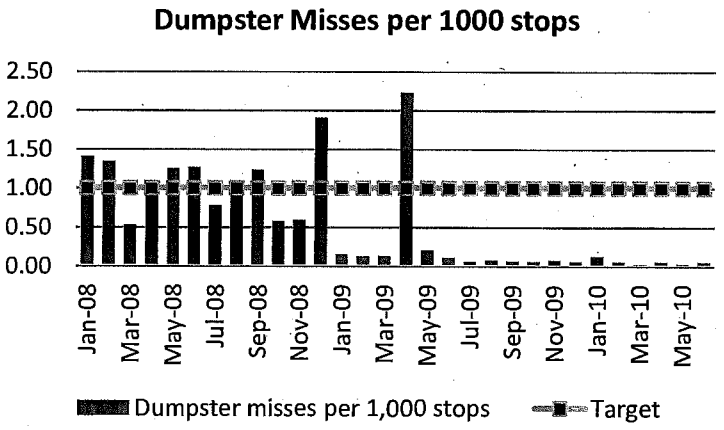
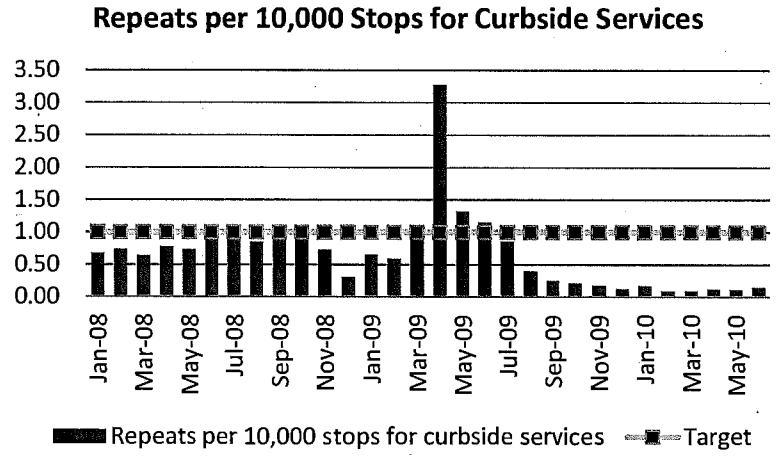


Figure 4-5
Dumpster Misses per 1000 Stops



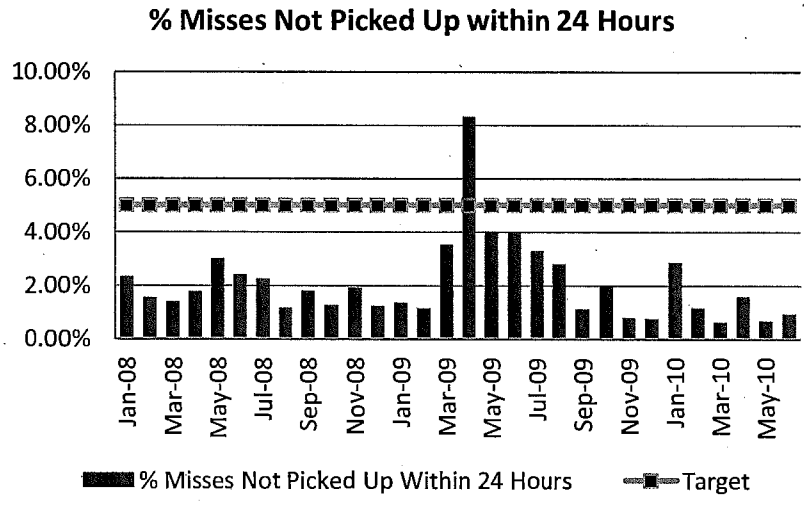
SPU also tracks repeat misses (how many times a missed customer is missed again). The service target for repeats is one miss per 10,000 scheduled pickups (target = 1/10,000 collection). Figure 4-6 shows repeat misses before, during and a full year after the transition to new collection contracts starting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

Figure 4-6
Curbside Services Repeats



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
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).

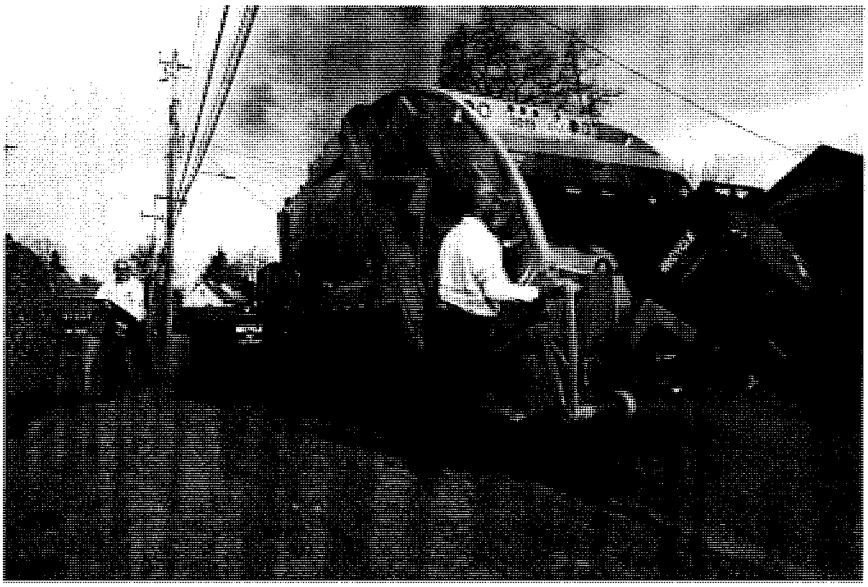
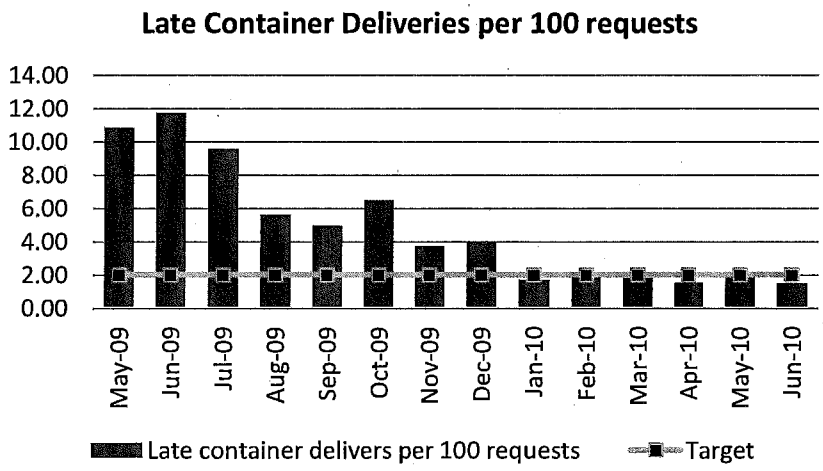


Figure 4-8
Late Container Deliveries



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.

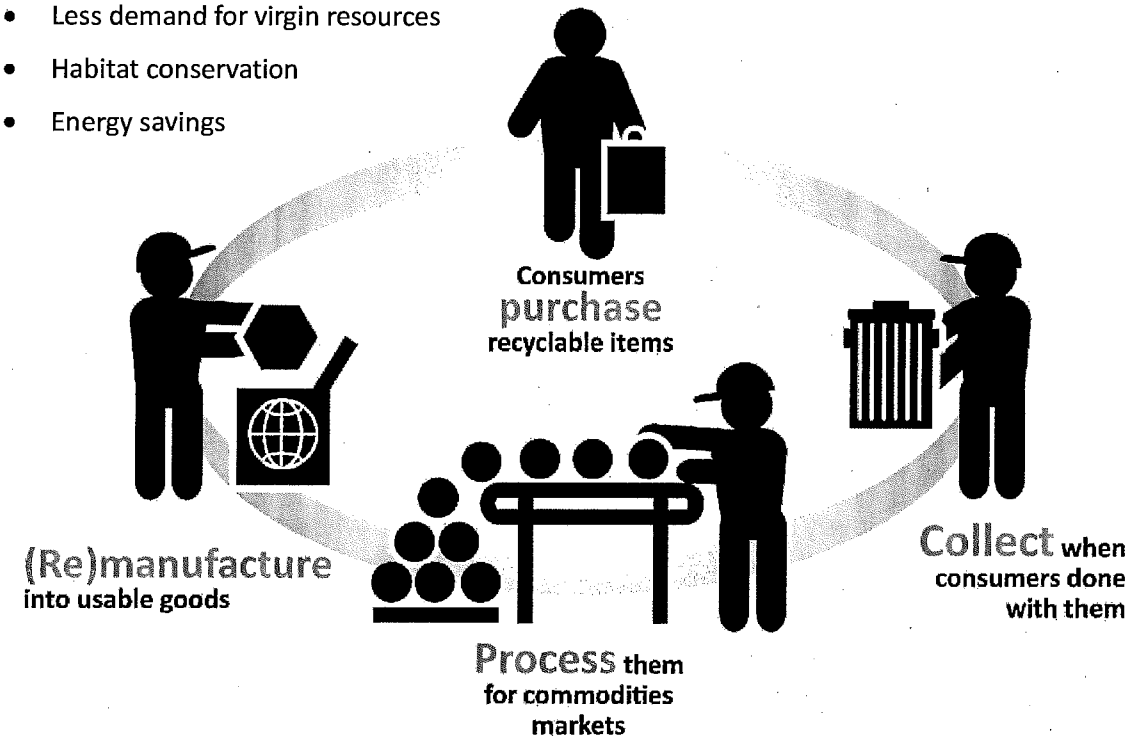
SPU highlighted these results with our new contractors before our new 2009 contracts began. We also introduced a more comprehensive set of performance incentives in the 2009 contracts. Under the new contracts, overall performance has increased. And there is no apparent statistically significant relationship 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
Prior SPU Solid Waste Plan Recycling Recommendations

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 the 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 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*, should yield increased diversion 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 the 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 4.3 Transfer Facilities
- Section 4.5 Processing and Disposal
- Chapter 5, Other Seattle Solid Waste Programs, section 5.3, Clean City
- 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. The 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 program	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 modeled new bans are MSW bans—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 the 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 the 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 construction and demolition 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 construction and demolition debris	SH	Recyclable C&D materials	Transfer
32	Commercial organics ban	Food and yard waste not allowed in the garbage	Com	Food, yard waste, non-recyclable paper	Collection
36	Carpet take-back program	Work to encourage more private recycling capacity in the region; more end markets for the 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 the list of recyclable materials that are not allowed in the garbage (currently cardboard and office paper)	Com	Plastics, cans, glass, aluminum	Collection
41	Restore education	Restore waste reduction and recycling education, Resource	All	All recyclables	All

RPA #	Program	Description	Target Sectors*	Target Materials	System Stage
		Venture, to pre-recession levels			
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 the 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 the garbage	Com	Plastic film	Collection
51	Pre-scale recycling	Increased drop off recycling convenience at rebuilt city stations by locating before the scales	SH	All recyclables allowed for drop off at stations	Transfer
52	Divert reusables from self haul	Private reusables business contracted to pull materials pre-scale, SPU provides s 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 construction and demolition 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 Mat				✓
	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

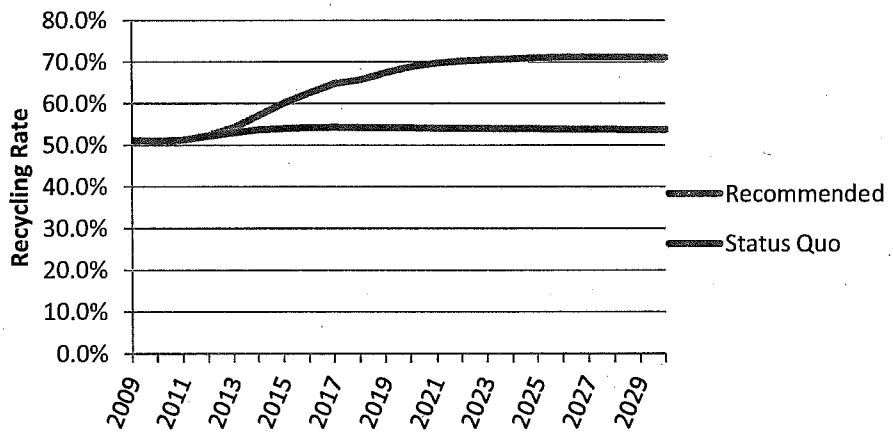
RPA projections estimate the recommended set of recycling programs will move Seattle's overall recycling rate to 60% by 2015, 3 years later than the 2012 goal set in the *Zero Waste Resolution* (Table 4-14). However, Seattle would achieve the 70% goal 3 years sooner than the resolution's 2025 goal, then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

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 SWP Recommendations on 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 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 the city's existing Recycling and Disposal stations	Ongoing
Build a Recycling Center at the SRDS, and consider acquiring property adjacent to the 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 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 STS and is design goal for new 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
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

Past Recommendations	Status
	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 City Council Resolution 30990 indefinitely postponed intermodal and directed SPU to proceed with rebuilding NRDS and SRDS. SRDS 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:

- **Improving and expanding the two 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.

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 distinct stages:

South Transfer Station (STS)

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.

North Transfer Station (NTS)

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.

South Recycling and Disposal Station (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	NTS 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 will be finalized in 2011. Also starting in 2011, all heavy equipment purchases will be 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 as of 2011. 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/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 on line it will require programmed space to take advantage of this waste diversion opportunity.

Shifting Capital Planning

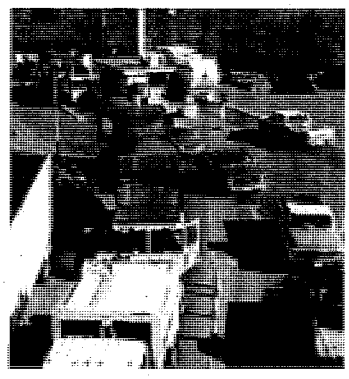
Capital planning shifts to major maintenance and equipment replacement after the rebuilds are done. The new facilities are designed for a 50-year service life. Once constructed, major capital replacement projects, including compactor replacement, floor resurfacing and facility roof replacement will need 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 State of Washington covered load law.

- Floor staff direct vehicles and keep the operational areas clean and safe. They also keep an eye out for unacceptable materials.
- Administrative staff ensures 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 actions 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 Curb Waste and Conserve and the web pages connected to the web cam congestion-viewing service. We plan to increase promotion of curbside services when revenues permit, likely in 2012. 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 document focused on programs to make new gains toward these goals: with an eye to optimizing the 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
- And 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 the old facilities safe and functional as long as they are being used.

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 they were designed for.

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

This section summarizes the processing and disposal recommendations from the 1998 plan and its 2004 amendment (Table 4-19).

Table 4-19
Processing and Disposal Recommendations from Previous SWP

Recommendation	Status
1998 Plan	
Support development of new organic materials processing capacity for yard and food waste	Local processor well established. Multiple sites and 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, of 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 around what happens with 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 1960, 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

Disposal facilities

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 — The landfill with which Seattle currently contracts 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 for designating additional recyclable materials, and modifying collection programs as needed.)

Composting — Similar to 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 affect landfill the landfill gas to electrical energy system, by reducing the amount of gas.

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 for more contamination in the yard and food waste streams is increasing with the inclusion of more compostable food packaging, and as Seattleites increasingly become aware of the opportunity to compost these products. 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.

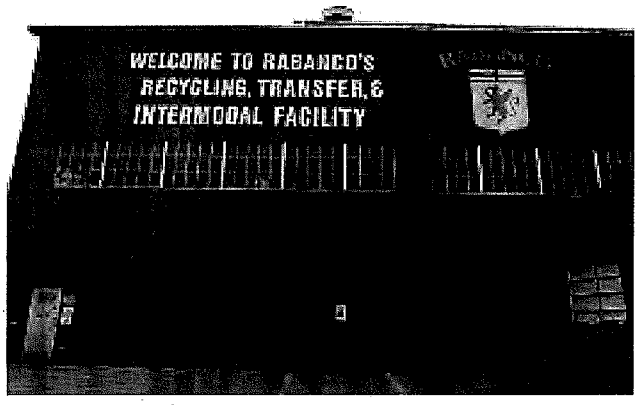
Recycling Processing

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, is guaranteed through 2013, by city choice can be extended to March 2016, and by mutual choice can be extended to 2019. SPU will review options for the future well before 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 F, Recycling Business 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).

The contract contains further provisions for, among others:

- 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, 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.

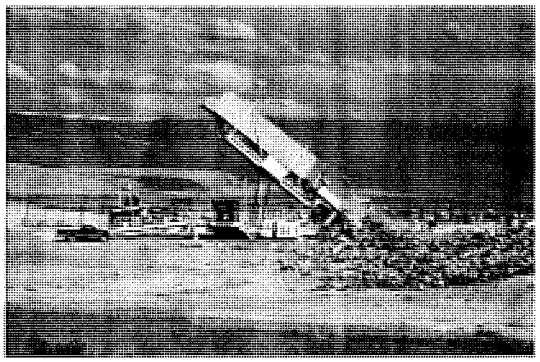
Rail Haul and Landfill Disposal

The city 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 landfill is the Columbia Ridge Landfill and Recycling Center in Gilliam County, Oregon, which 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 (# available, storage availability, location, transfer station of origin, etc.)
- 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 meets 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 a landfill gas-to-electricity (LFG) 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 ("dirty" Materials Recovery Facility (MRF)).

Yard and Food Waste Composting

As with recycling processing, any significant alternatives for yard and food waste composting would be to the contract 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 goes 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's 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 & 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 (see Appendix N of the COOP for MSW Continuity Plan worksheets). 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 has 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.

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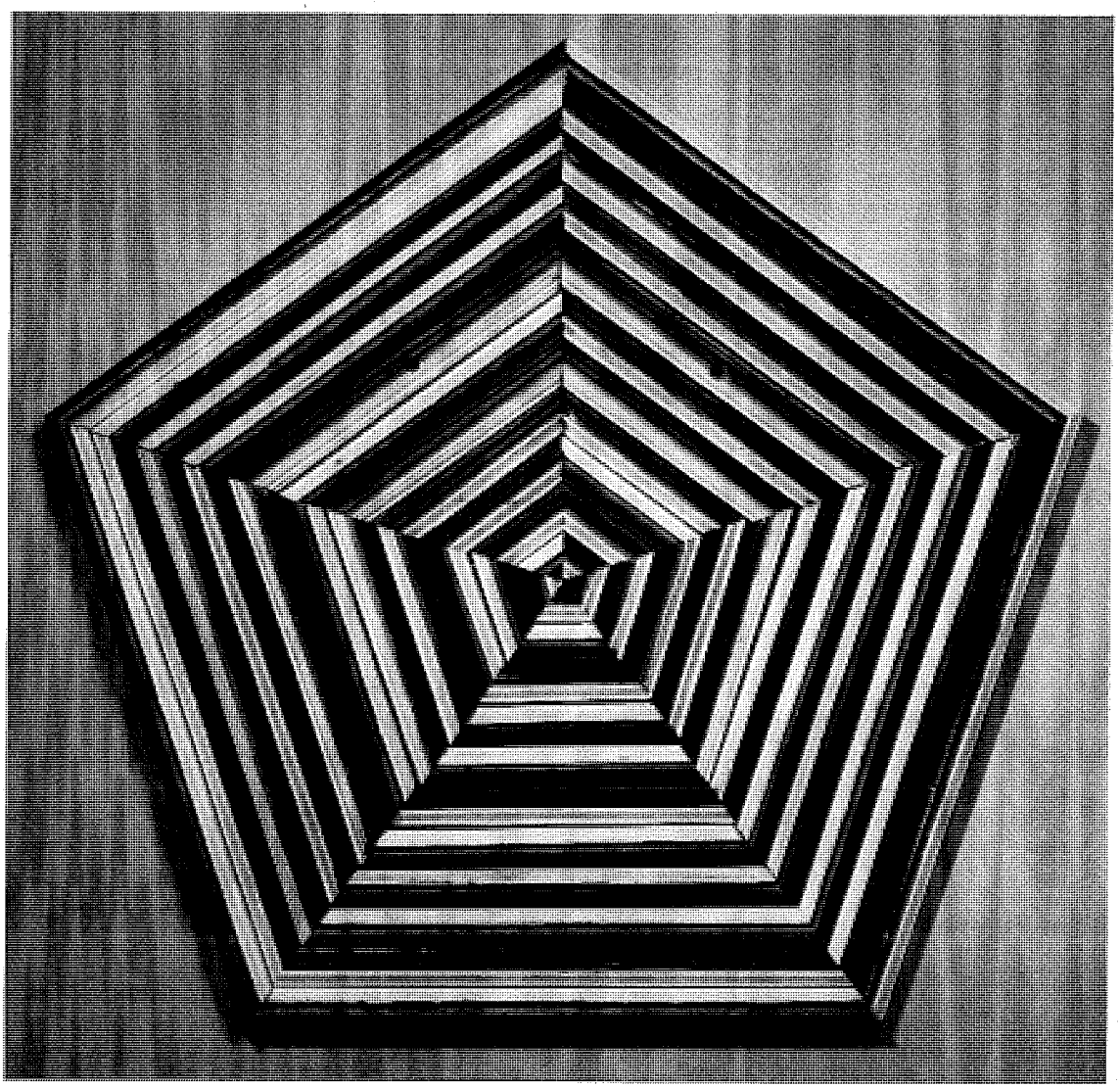


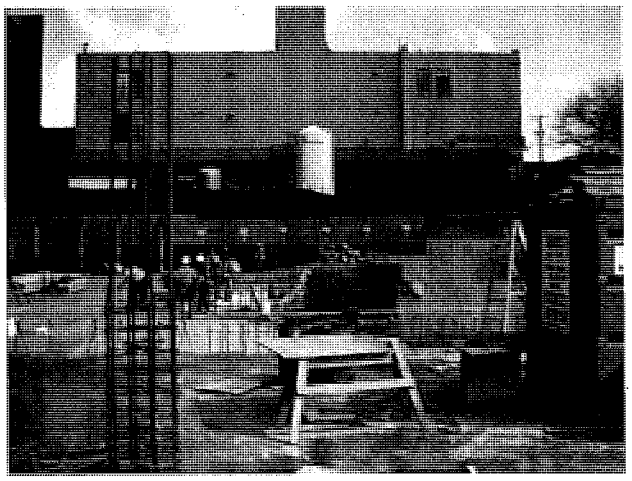
Chapter 5 OTHER SEATTLE SOLID WASTE PROGRAMS

This chapter describes all the other solid waste-related programs run by the City of Seattle. The materials involved in these programs are not defined as municipal solid waste (MSW). Construction and demolition debris (C&D) comprises the major portion of these materials. This chapter also discusses historic landfill management, programs that address street-side litter and illegal dumping, special wastes, and management of moderate risk waste. SPU's solid waste management team is also responsible for abating graffiti on public property, which is funded separately from solid waste functions.

5.1 CONSTRUCTION AND DEMOLITION DEBRIS

Construction and demolition debris (C&D) is a large portion of all Seattle's wastes. Construction and demolition projects generate C&D materials. The materials include concrete, asphalt paving, aggregates, wood waste, structural metals, asphalt composition roofing, gypsum wallboard, insulation and others.

The materials SPU counts as C&D are not handled through the MSW system. However, some C&D-type materials enter the MSW system. C&D waste generation is considerably more variable compared with MSW and is highly sensitive to economic upswings and downturns.



In the past, C&D handlers delivered materials to separate C&D landfills for disposal. Now most Seattle C&D is disposed in the large regional landfills in eastern Washington and Oregon (which also accept MSW).

5.1.1 Recommendations from 1998 Plan and 2004 Amendment

The 2004 Plan Amendment included neither specific goals nor objectives for C&D. The major reason was difficulty in tracking and measuring the amount of C&D handled outside Seattle's MSW system. However, the 2004 Amendment did propose pursuing measurement strategies and developing a recycling goal for C&D.

Since then, SPU carried out studies on waste generation, collection practices, recycling levels, processing facility capacity, and end-markets for C&D materials. The 2007 C&D Waste Stream Composition Study focused on types of C&D from sectors such as new construction, demolition, and remodeling. A major 2008 study researched the capacity of Seattle area C&D processing facilities. SPU also receives monthly data from the private transfer stations on amount of disposed C&D.

In 2007, SPU began tracking C&D amounts delivered to recycling facilities. We gather this information through a requirement on all recyclers doing business in Seattle. Recycling businesses must report their recycling tonnage directly to the city each year. However, many C&D recycling sites lie outside Seattle's city limits and are not required to report. Tracking C&D tonnage delivered for processing outside the city remains a challenge.

5.1.2 Planning Issues

The 2007 Seattle City Council Resolution 30990 (the *Zero Waste Resolution*) included a number of actions to reduce the amount of C&D waste disposed of in landfills. These included:

- Modifying DPD's demolition permit to allow salvage and deconstruction to more easily occur
- Examining public contracting, financial incentives or other assistance to develop more C&D processing capacity
- Assessing types of financial mechanisms to that would create more incentives for more reuse or reprocessing of C&D materials
- Evaluating new city initiatives such as a deposit system, mandatory recycling or disposal bans to increase C&D recycling
- Evaluating if there should be a ban on the disposal of C&D recyclables at city transfer stations
- Market development, focusing on tear-off asphalt shingles

SPU and DPD carried out many of these action items. Such as developing a new permit for deconstruction, and partnering with King County on new recycling market initiatives for tear-off asphalt shingles and carpet. SPU produced the facility processing capacity study in 2008, which recommended that the city proceed with processing facility certification.

A thorough appraisal of new recycling programs ruled out a deposit system. The city's Department of Planning & Development (DPD) cannot legally charge more for permit fees than the cost of service. While SPU could implement a deposit system, it would have higher administrative costs than other approaches. Other possible approaches include mandatory recycling or banning C&D recyclables from landfill disposal.

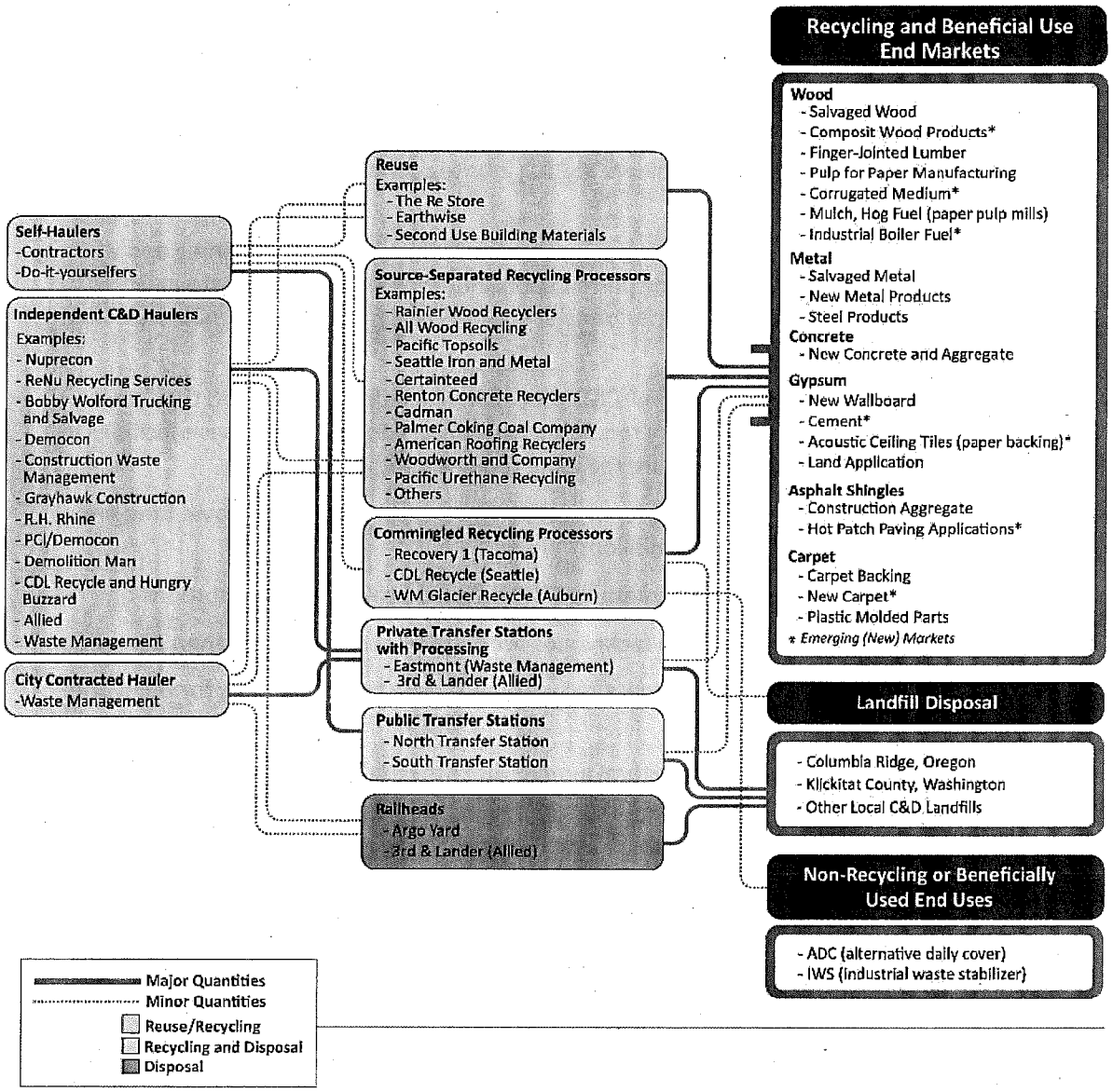
Current planning issues and long-term goals for C&D group into four focus areas. Each focus area includes possible strategies for moving forward toward the goals.

1. **Goal Setting —** What are appropriate and achievable recovery goals for C&D?
   - Develop an overall Seattle recovery goal for C&D delivered to private transfer stations for disposal
   - Set specific recovery goal targets for various C&D sectors such as new construction, demolition, and remodeling
2. **Program Strategy —** Which program strategies will lead to the most recovery at least cost to Seattle and the C&D industry?
   - Evaluate the costs and benefits of potential programs to increase recycling. These could include mandated recycling, and disposal bans on readily recyclable materials in jobsite containers. The City of Seattle could also mandate that construction wastes be delivered to transfer stations for disposal.
   - Ensure that recycling containers at C&D jobsites contain less than 10% non-recyclable materials
   - Adopt a suite of C&D recycling programs for 1) Department of Planning and Development (DPD) building permit applicants who do not participate in Green Building programs, and 2) city transfer station customers who do small-scale home remodeling
   - Develop a process to "certify" C&D processing facilities in the region that meet Seattle's minimum recovery requirements. Direct contractors to these facilities in order to meet possible future recycling requirements and goals
   - Expand local recycling capacity in Seattle to decrease contractor travel time and vehicle greenhouse gas emissions
   - Expand the recovery of marketable C&D delivered to city transfer stations
   - Encourage deconstruction techniques for building removal rather than demolition
3. **End-Market Strategies —** How can Seattle promote robust markets for recovered materials?
   - Increase the supply of structural lumber and other salvageable commodities for reuse instead of disposal
   - Increase the supply of clean wood for recycling end-markets such as wood composite product or pulp and paper manufacturing, rather than diverting it to a lower value "beneficial use" end-markets such as industrial boiler fuel
   - Expand local processing capacity and end markets for certain C&D commodities that currently lack large, local markets, such as scrap carpet and tear-off asphalt shingles.
   - Develop end-markets for difficult to recycle materials. Such materials often have a potentially hazardous attribute like lead-based paint on gypsum wallboard.
4. **Evaluation —** How can we tell if adopted strategies are working?
   - Improve reporting of how much C&D was recycled, "beneficially used " and disposed

Opportunities to implement programs lie at various points in C&D generation, collection, processing, and disposal (Figure 5-1). The following sections describe this flow (or system).

See this chapter's discussion of Rule on End-Markets for what the City of Seattle classifies as acceptable recycling and beneficial use end-markets.

Figure 5-1
Flow of Seattle-Generated C&D Materials



Note: Figure 5.1 is conceptual. The list of companies is not inclusive and shifts over time.

Who Collects C&D and where does it go?

Collection

Many types of collectors (or haulers) transport C&D materials. They deliver the C&D to a mix of private and public transfer and processing facilities, both inside and outside of Seattle. The term *self-haul* is used when the generator and collector of the waste material is the same person or entity. C&D collectors include:

- **Homeowners** taking remodeling debris to Seattle transfer stations.
- **C&D contractors** who do home or office remodeling and haul C&D debris to a city or private transfer station in Seattle. Waste Management and Republic Waste Services (formerly Allied Waste Services) operate the two private stations.
- **Large Independent C&D haulers** offering hauling services to construction or demolition contractors. Typically, these firms deliver C&D to private recycling facilities, often located outside Seattle. Because they receive a fee for their hauling services, these firms are not considered self-haulers. They cannot transport Seattle-generated C&D waste for disposal. They can only transport recycling.
- **City-contracted collector** of all C&D for disposal. Only the one firm holding the City of Seattle contract for this service may haul C&D bound for disposal. The city awarded this contract to Waste Management in 2007. They are the only company that can charge a fee for transporting C&D from any construction site within the city limits if the C&D is going to disposal.

C&D recyclables can be collected in either source-separated (separated onsite) or commingled (mixed materials) recycling containers. An example of *source-separated* recycling is a drop box for just clean wood waste. An example of *commingled* recycling is a drop box for mixed recyclables such as wood waste, metal, wallboard, and packaging materials. New construction sites often use source-separated recycling containers since materials are easily set apart at each stage of building construction. Sites with limited space often use commingled boxes. By law, recycling drop boxes may contain no more than 10% non-recyclable C&D.

Usually, with demolition, some marketable materials (doors, windows, or flooring) are salvaged before the structure is removed. Demolition contractors often order a large, 100-cubic-yard intermodal container delivered to the jobsite. These wastes go directly to a railhead for landfill disposal. Sometimes structures contain a lot of potentially hazardous and difficult to recycle material. Recycling can be a major challenge when remodeling or demolishing such structures.

Processing

A wide variety of facilities receives and processes C&D materials in the Seattle area:

- **Reuse** — Businesses for fixtures, structural lumber, metal pieces and other salvageable materials. See Chapter 3, Waste Prevention, for more detail.
- **Source-Separated** — Recycling facilities for single commodities separated at the job site, such as clean wood waste, concrete, gypsum scrap, metal or tear-off asphalt shingles. Source-separated facilities account for much of the C&D recycling in the region.
  - Often located outside Seattle and have
  - Usually very low tip fees compared to disposal
  - Very high recovery rates, around 95%
- **Commingled** — Recycling facilities for a various commingled commodities such as wood waste, metal, gypsum scrap, carpet, packaging materials and aggregates.
  - Three permitted, commingled C&D processing facilities operate in the Seattle-Tacoma area.
  - Tip fees lower than disposal fees
  - Can recycle 80 to 85% of the primarily clean, recyclable C&D loads they receive.
- **Material Recovery** — Operations at private transfer stations for mixed C&D. These facilities sort loads thought to have a high percentage of recyclable materials.
  - Charge higher tip fees due to the costs of manual or mechanical sorting
  - Recovery rates vary greatly, depending on the recyclability of materials in a load
  - Loads of relatively clean materials can reach 65% recovery
- **Drop Boxes** — Public transfer stations can offer drop boxes for source-separated materials such as clean wood waste.
  - Usually a fee for recycling clean wood since the city must transport it to a processing facility

Mixed C&D loads delivered to a city transfer station currently get disposed with MSW. The city transfer stations do not have a C&D sorting system.

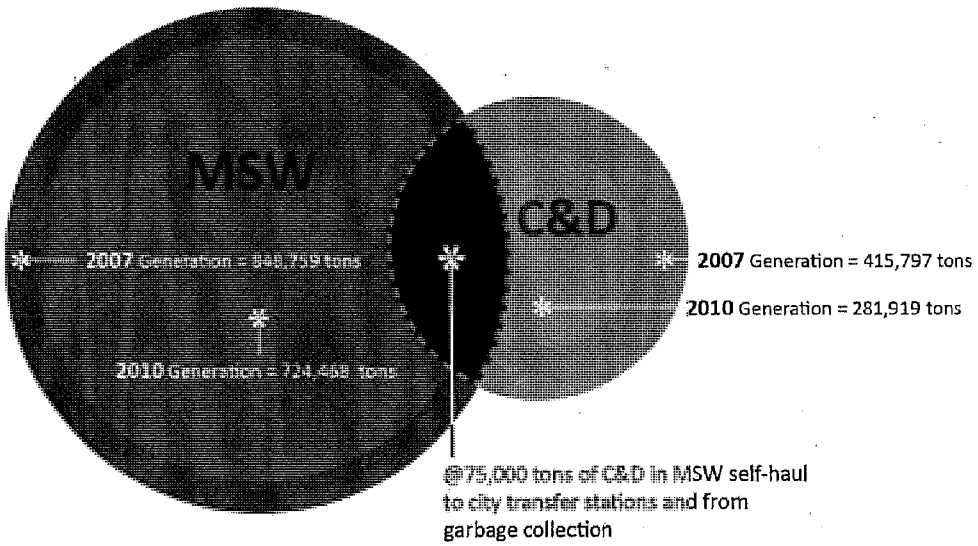
Disposal

Most non-recyclable C&D wastes in Seattle are disposed through private transfer stations. Private transfer stations typically have lower tip fees than the public stations. They are also set up to handle large, self-unloading trucks. Two railheads in Seattle accept large intermodal containers directly—mostly from demolition projects— for transport to a landfill.

C&D in MSW

Some C&D is not managed as just described. Instead, it becomes part of the MSW stream (Figure 5-2). Homeowners and small businesses deliver some C&D in their self-haul loads to the city transfer stations. C&D materials also turn up in curb or alley garbage containers set out for collection.

Figure 5-2
Overlap of MSW and C&D Generation in Seattle in 2007 and 2010



How Much C&D Does Seattle Have?

The first step in designing new programs for increasing C&D recycling is to understand how much C&D waste is generated in Seattle. This means understanding the amounts of C&D materials handled by the public and private sectors.

C&D Recycling Rate Definitions

The categories used for calculating the C&D recycling rate are essentially the same as for the MSW recycling rate.

- **Recycling** — wastes separated for recycling or reuse
- **Beneficial Use** — discards not recycled or reused, but used for some other purpose like industrial boiler fuel. Excluded from the recycling rate, counted as diverted in the diversion rate
- **Alternative Daily Cover (ADC) and Industrial Waste Stabilizer (IWS)** ADC covers the active face of a landfill instead of soil. IWS provides structure in specialized landfills. Counted as disposal in the recycling rate.

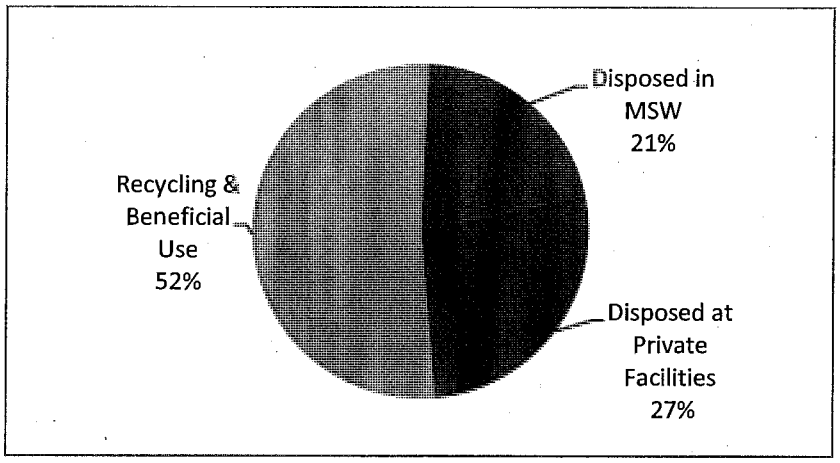
In addition to calculating the recycling rate, for C&D we calculate the "**diversion**" rate, the sum of recycling and beneficial use.

C&D Generation with MSW

Total generation consists of both recycling and disposal components.

Analysis done on 2010 tons, that included C&D from all sources including MSW, showed about half of all C&D was either recycled or beneficially used. The other half was disposed as C&D or MSW (Figure 5-3).

Figure 5-3
C&D Generation in Seattle in 2010 All Sources



In 2010, about 21% of all C&D entered the MSW System and was disposed. The remaining 79% of C&D (around 282,000tons) went to:

- Private transfer stations and railhead intermodal facilities for landfill disposal (27%). This includes ADC and ISW produced by processing facilities.
- Recycling facilities - processing about 52% of the total 2010 tons for recycling and beneficial use end markets.

Of all C&D tons generated in 2010 (including the estimated MSW portion), the overall diversion rate for C&D was 52%, and 48% was disposed in a landfill.

C&D Generation without MSW

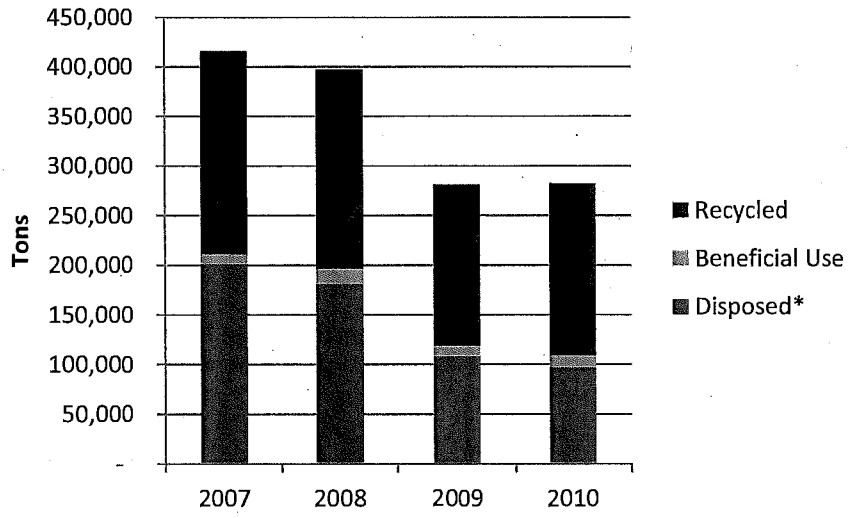
Seattle's C&D planning focuses on the C&D stream that does not include MSW (Table 5-1). Chapter 4, Seattle's MSW System: Managing Discards, section 4.3 addresses planning for C&D materials in MSW. The discussion from this point forward focuses on C&D without MSW. Recycling and diversion rates are much higher when MSW is excluded (Figure 5-4).

Table 5-1
C&D Generation in Seattle 2007 - 2010

Year	Total Generated	Disposed*	Recycled	Beneficial Use	Recycle Rate	Diversion Rate
2007	415,797	201,156	204,903	9,738	49.3%	51.6%
2008	396,930	181,240	200,729	14,961	50.6%	54.4%
2009	281,081	108,071	162,648	10,362	57.9%	61.6%
2010	281,919	96,946	173,109	11,864	61.4%	65.6%

*Disposed includes ADC and IWS. Recycling rate does not include ADC or IWS. Diversion rate equals recycling plus beneficial use

Figure 5-4
C&D Recycling and Disposal Tons 2007 - 2010

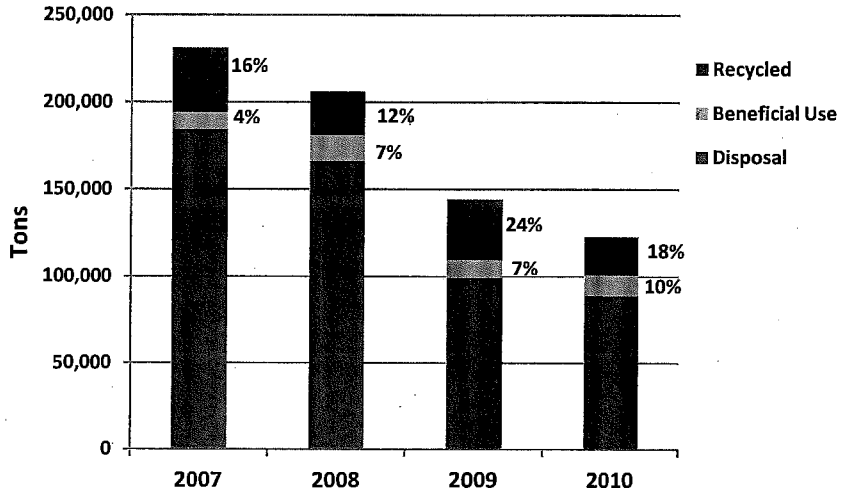


Source: City of Seattle 2007 – 20010 annual recycling report data

By far, concrete and other aggregates have the highest recycling rate of any material. In 2010, concrete and aggregates accounted for 82% of the diversion rate.

Based on 2010 analysis, after removing concrete from the recycling and disposal data, the diversion rate drops by over seventy-five percent (Figure 5-5).

Figure 5-5
C&D Recycling Rates without Concrete in 2007 – 2010

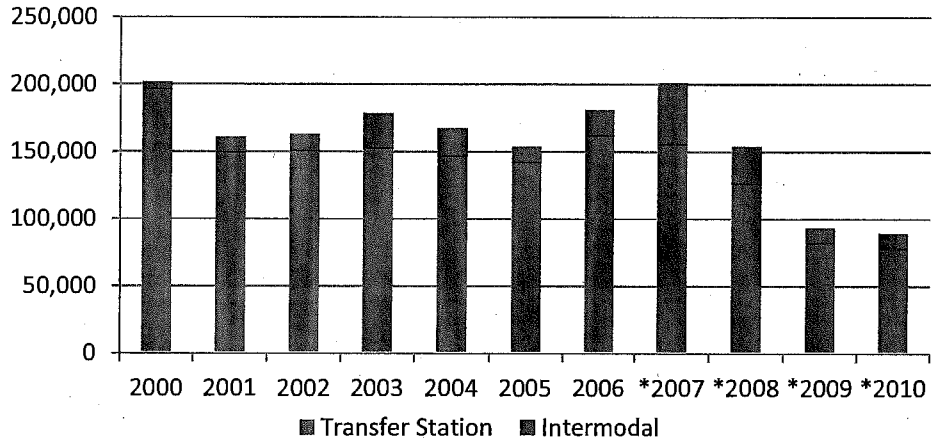


Variability of C&D Tons

A notable feature of the C&D waste stream is how greatly it varies due to changing levels of construction activity. The high point over the last decade occurred in 2000, followed by 2007, the benchmark year for many SPU studies of C&D. The year 2009 marked the low point, when disposed C&D tons dropped by more than 50% compared to 2007.

C&D amounts delivered to the private transfer stations and intermodal facilities are shown on Figure 5-6. The blue bars are loads delivered to these facilities in trucks. The red bars show disposal loads delivered directly to railheads operated by Allied and Waste Management.

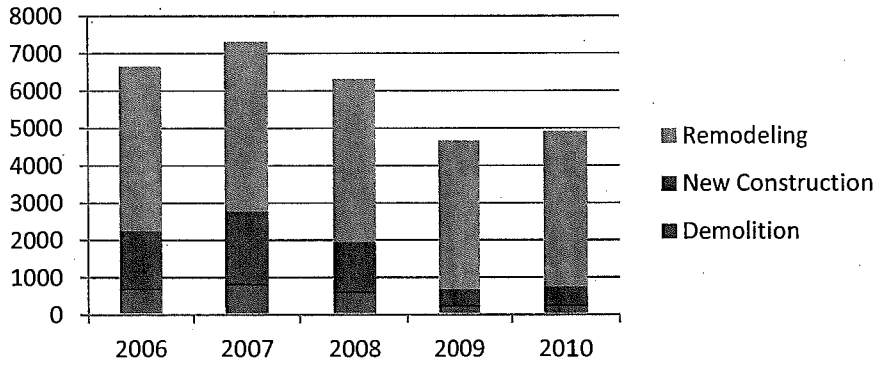
Figure 5-6
C&D Disposed Tons - Private Stations and Intermodals in Seattle 2000 - 2010*



*2007-2010 includes Third and Lander Street intermodal tons and Argo Yard. Allied and Waste Management operate the private stations.

The drop in DPD permits over the past 3 to 4 years corresponds with large projects' disposed C&D decreases. The number of permits for new construction and demolition projects fell dramatically from 2007 to the end of 2009. The permits for remodeling remained constant by comparison (Figure 5-7).

Figure 5-7
Number of DPD Permits issued by C&D Sector

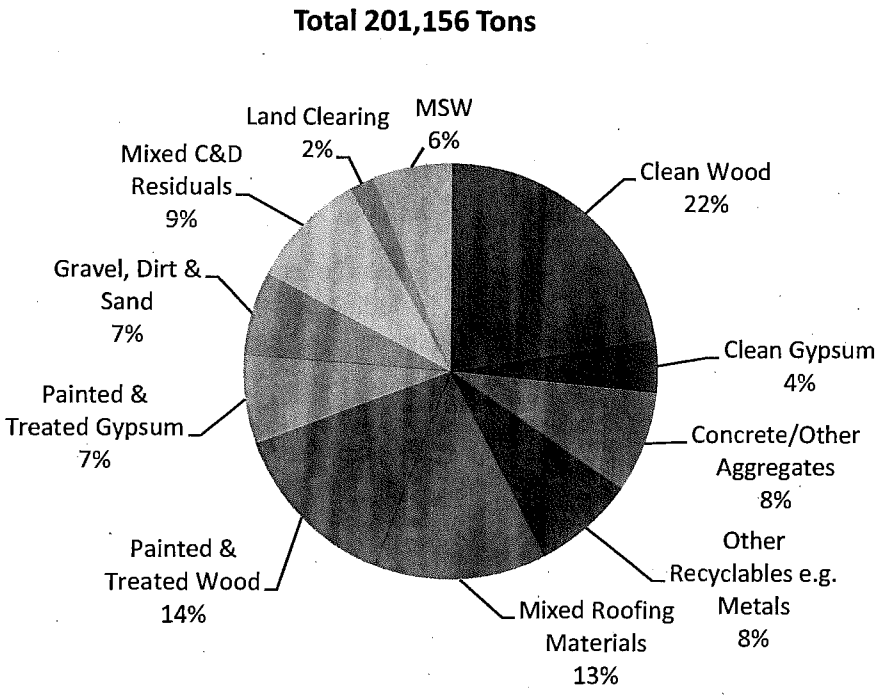


Regional economic forecasting shows a gradual rebound of construction over the next 5 years. The forecasting uses a range of variables, including Seattle and King County building permit data. . Longer term forecasting expects construction projects to stay below the 2007 level.

What is in C&D Waste?

In 2007, the City of Seattle studied the composition of the C&D waste streams delivered to private transfer stations and intermodal containers operated by Republic Waste Services and Waste Management (Figure 5-8).

Figure 5-8
Composition of C&D Disposed at Private Stations



Source: City of Seattle 2007 C&D Waste Stream Composition Study

The 2007 study found that about 51.3 % of disposed C&D was readily recyclable. These materials included concrete, asphalt and other aggregates, clean wood, ferrous and non-ferrous metals, clean gypsum, land clearing debris and aggregates. Another 13%, such as tear-off asphalt shingles, was on the verge of being recyclable as local end uses emerge. Tear-off asphalt roofing shingles may soon be recyclable with more market development for using them in hot mix paving. About 35.7% (71,813 tons) of the C&D waste stream was non-recyclable. The non-recyclable portion was potentially hazardous or mixed solid waste.

How Much of C&D Recycling is Recovered?

The various commodities in disposed C&D have different recovery rates (Table 5-2).

Table 5-2
C&D Recovery Rates by Material in 2010

	Landfilled	Recycled	Beneficial Use	Recovery %
Clean Wood	21,784	15,420	9,119	44%
Treated & Painted wood	15,646	0	N/A	0%
Clean Gypsum Board	4,024	7,094	N/A	63%
Painted/Demo Gypsum	6,621	0	N/A	0%
Roofing	12,997	1,468	N/A	10%
Sand & Soil	5,300	0	N/A	0%
Concrete & Aggregates	8,049	151,230	N/A	95%
Other C&D	9,801	3,244	0	48%
Metal & Other Ferrous	3,812	4,084	N/A	51%
MSW Recyclables(carpet, plastic film, paper, landclearing debris)	6,825	(carpet) 67	N/A	1%
Hazardous & Other	4,595	0	N/A	0%
ADC and IWS	13,282	N/A	N/A	N/A
Total Tons with Concrete	**96,946**	**173,109**	**11,864**	**61.4%**
Total Tons without Concrete	**88,897**	**21,879**	**11,864**	**17.8%**

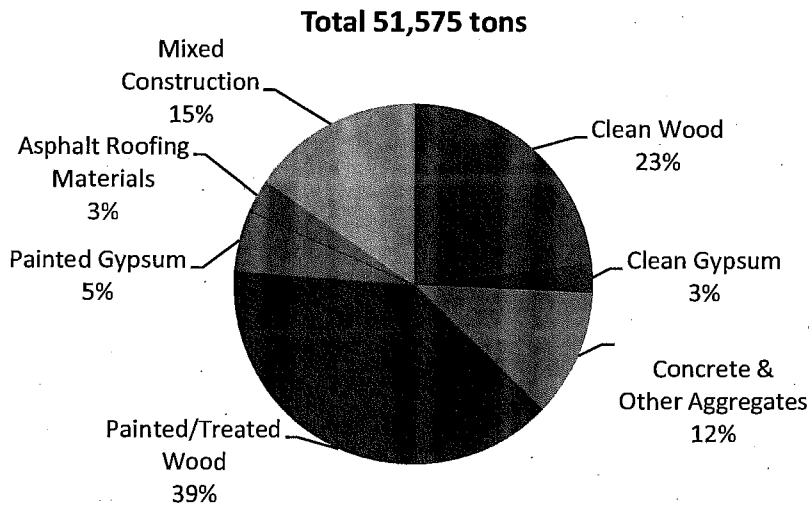
Source: City of Seattle 2010 annual recycling report data and 2010disposal data from private transfer stations

See section 5.1.4, Recycling Program Alternatives, for detail on recovery of these commodities.

C&D in MSW Self-Haul Composition

According to the 2008 composition study for the self-haul waste stream, self-haulers delivered around 51,575 tons of C&D to City of Seattle transfer stations (Figure 5-10). About 37% was readily recyclable (clean wood, clean gypsum, concrete and aggregates). Another 3%, tear-off asphalt roofing shingles, is expected to become recyclable soon.

Figure 5-10
Seattle Self-Haul C&D Waste Composition in 2008



Source: City of Seattle 2008 Self-Haul Waste Stream Composition Study

5.1.3 Current Programs and Practices

The City of Seattle has developed many programs focused on providing contractor education, technical assistance, and incentives for reducing C&D generation and disposal. In recent years the we also put major efforts into market development for C&D materials with low recovery rates. SPU does this work in coordination with King County and other public agencies.

C&D Programs Linked with Waste Prevention

Several programs important to C&D waste prevention and recycling are discussed in Chapter 3, Waste Prevention.

Green Building Programs

The City provides technical assistance for the building industry to support the following:

- U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) standards
- Master Builder's of King and Snohomish counties' local Built Green standards for residential construction
- Green Home Remodel Program

These green building programs have been a great incentive for contractors to divert construction wastes from disposal to recycling, to gain credits for LEED and Built Green certification.

According to the City Green Building 2008 to 2009 Progress Report, the City of Seattle diverted about 30,600 tons of C&D materials to recycling through these projects. Under

the Built Green program, by 2009 about 568 tons of construction waste was sent to recycling.

Deconstruction Permit

Deconstruction means taking apart a structure in an orderly manner to get the most reuse and recycling. In 2008, DPD started a new demolition permit for residential housing that allows more time for salvage and deconstruction. Per the terms of the permit, applicants submit a *waste diversion plan* that DPD must approve. The plan shows how the project will meet minimum salvage and deconstruction requirements. Across 2009-2010, 10 buildings were removed through deconstruction permits.

Deconstruction Research

The city has done research on deconstruction to see how more of it can be encouraged. A series of pilots over 2007-2009 removed single-family houses using deconstruction techniques. Broadcasting education materials to the building community was a key aspect of the pilots. In 2009, SPU developed a business plan model for a Hybrid Deconstruction Center. Such a center would accept sections of structures for taking apart to recover materials. A Washington State Department of Ecology Coordinated prevention Grant funded the business plan model. See Chapter 3, Waste Prevention, for more detail on the model and other sustainable building programs.

Recycling Technical Assistance for Contractors

The Resource Venture, SPU, and King County Green Tools Program websites all have information on where to recycle various types of materials. A published King County/Seattle Recycling Directory is also available. The city used to offer onsite recycling help through the Resource Venture. These contracted services ended in 2008 due to budget cuts.

Market Development

Market development works to develop local processing capacity and end-markets. Targeted C&D materials for market development include scrap carpet and asphalt shingles.

A carpet facility would separate the face fiber from the backing to recover commodities such as different types of nylon. The nylon can be used in new carpet or a variety of plastic molded products.

To develop a statewide market of tear-off asphalt shingles, the city has supported the King County Linkup Program's efforts on this material. These efforts include a major demonstration project by King County Roads Division. In this project, the process blends shingles into a hot mix paving application. State and local agencies, paving companies, and recycling processors all took part in developing material specifications. King County paved a 4-mile stretch of roadway with various mixtures of recycled asphalt shingles in 2009. King County will monitor the demonstration project over several years. If successful, the program will significantly expand the use of tear-off asphalt shingles.

Chapter 3, Waste Prevention, contains additional discussion of Green Building, Deconstruction, Contractor Technical Assistance, and Market Development programs.

Ban on Disposal of Asphalt Paving, Bricks and Concrete

In March 2011, the Seattle City Council passed Ordinance 123553. The ordinance forbids disposing asphalt paving, bricks, and concrete in any type of garbage container at construction sites. It also forbids disposing the same materials at private or public transfer stations. The prohibitions start in 2012. The city will conduct education and outreach about this new requirement in 2012. Penalties may apply in 2013. These materials already see a very high rate of reuse or recycling. And public construction projects are already required to keep them out of the garbage. Exceptions to this disposal ban include painted materials, those made with hazardous constituents, or those present only in very small quantities.

City of Seattle Regulations and Collection Contracts

Washington State law assigns primary responsibility for solid waste management to local government. This responsibility includes the collection, transfer, and disposal of solid waste. It also includes recycling and waste prevention. When the City of Seattle took control of its commercial waste stream in 2001, it became responsible for regulating C&D waste hauled for disposal. Seattle Municipal Code 21.36.012(5) states that materials are considered the "City's waste" if they contain more than 10% by volume of non-recyclables. The following lists City of Seattle regulations that govern collection contracts:

- **Hauling of C&D Materials**:
  - **Hauling for Recycling** — Any company is allowed to collect materials destined for recycling, including recyclable or beneficially used C&D. However, the collected materials may contain no more than 10% non-recyclable or non-beneficially used material, by volume. Recycling collection containers must be clearly labeled. C&D generators save money if they recycle because they avoid city and state solid waste (garbage) taxes.
  - **Hauling for Disposal** — In 2008, the city awarded an exclusive contract to Waste Management for hauling C&D disposal waste. Businesses that haul their own waste, or haul wastes that result from another service provided by the business, are exempt from using this contract. For example, roofing companies usually haul tear-off asphalt shingles from their own jobs.
  - **Statewide Rule on Jobsite Containers** — A recent statewide rule requires jobsites to place a clearly labeled garbage container to keep contamination in recycling containers to a minimum.
- **Disposal Flow Control** — City of Seattle requirements govern where C&D disposal wastes can go (destination *flow control*).
- **Transfer Tax Applied to Jobsite Intermodal Containers of C&D** — A transfer tax now applies to the intermodal containers of C&D loaded at job sites and delivered to Seattle's two railheads for landfill disposal.
- **Rule on End-Markets for Recycling and Beneficial Use** — City code SMC 21.36.010 (9) allows the Director of SPU to define what counts as "beneficial use." SPU's definition of "beneficial use," as well as "recycling" and "disposal," is set down in Administrative Rule #SPU-DR-01-07. Examples of *recycling* end-markets include concrete made into new concrete, wood waste made into paper pulp for paper products, and

gypsum wallboard reprocessed into new wallboard. An example of *beneficial use* is unpainted and untreated wood waste chipped and sent to an industrial boiler for energy recovery. The Washington State Department of Ecology may also approve a specific use as "beneficial use" under WAC 173-350-200. *Disposal* includes using mixed C&D at a landfill as alternative daily cover for garbage, and as industrial waste stabilizer placed in industrial waste landfills. Disposal also includes energy recovery at a waste-to-energy facility.

5.1.4 Alternatives and Recommendations

C&D Alternatives Development

The process to develop C&D recommendations involved two stages of stakeholder outreach and econometric modeling.

Stakeholder Feedback Phase I

SPU discussed program options with industry stakeholders during the fall of 2010. Alternatives included a disposal ban on asphalt paving, bricks and concrete; mandatory recycling for all DPD applicants, with diversion levels set for different categories of projects; and C&D processing facility certification.

Stakeholders did not support mandatory recycling coupled with all DPD permits--particularly if tied to a project receiving its Certificate of Occupancy. The projects rely on haulers and facilities to provide the proper reporting. The haulers and facilities usually don't have the reports ready until after DPD issues a Certificate of Occupancy.

Stakeholders favored the idea of facility certification. A certified facility would meet recycling rate and other standards. Stakeholders further suggested a third party might best verify facilities for the program, instead of the city. Certification would increase the accountability of facilities. Stakeholders viewed this as a better first step compared to starting with mandated recycling rates on projects.

Another option offered by stakeholders was to set a requirement for sorting all C&D waste before any goes to disposal. This would shift the focus away from sorting at job sites, to facilities and their sorting efficiencies.

SPU used this phase of stakeholder feedback to shape further work on potential C&D recycling programs

Recycling Potential Assessment Analysis

The first phase of stakeholder input gave SPU information to help figure out potential C&D recycling program options to analyze. The analysis used the same modeling tool as used for MSW recycling programs (Table 5-4). The model analyzed variations on mandatory recycling percents, certain materials banned from the garbage, and

enhanced outreach. Almost all options included a certification program (that a processing facility meets some level of set recycling standards).

Table 5-3
C&D Recycling New Program Evaluations for Seattle

#	Program Options	Recycling Rate*	Additional Tons Recycled Per Year*
	Baseline Program – Expanded Voluntary + Status Quo	58.2%	-
1	Mandatory Recycling for All DPD Permittees with Report Basic certification	70.0%	17,462
2	Mandatory Recycling for Only New Construction and Demolition with Report and Diversion % Basic certification	69.0%	14,149
3	Mandatory Recycling for All DPD Permittees with Report and Meeting Diversion % Basic certification	71.1%	21,279
4	Bans Beyond Asphalt Paving, Bricks and Concrete for All DPD Permittees with Report Advanced certification	72.0%	23,634
5	Bans Beyond Asphalt Paving, Bricks and Concrete for All DPD Permittees with Report and Diversion % Advanced certification	74.2%	31,769
6	All Waste Sorted Before Disposal for New Construction and Demolition with Report Advanced certification	70.5%	19,076
7	All Waste Sorted Before Disposal for All DPD Permittees with Report Advanced certification	75.3%	35,244

*By the year 2020

SPU analysis of the C&D program options shown in Table 5-3 assumed the levels of certification shown in Table 5-4.

Table 5-4
Levels of Facility Certification in Seattle C&D Program Options

Program Option	Report Tonnages Recycled and Disposed of to City	Minimum Recycling Requirements	Sample Residuals for % of Targeted Recyclables
Status Quo	Only if in City	No	No
Basic Certification	Yes, even if outside of City	Yes	No
Advanced Certification	Yes, even if outside of City	Yes	Yes

SPU evaluated the model's results in combination with stakeholder input already received. This process resulted in the C&D recycling recommendations put forward in the August 2011 "Preview" Draft of this Solid Waste Plan. SPU then went back out to stakeholders for further review and feedback.

Stakeholder Feedback Phase 2

After releasing the 2011 Preview Draft of Seattle's Solid Waste Plan revision, SPU carried out a public review process to get feedback on the Plan's recommendations. The review process included a separate, parallel, process for C&D recommendations. SPU focused its C&D outreach to construction trade groups, property managers, recycling haulers, and processing facilities. SPU used meetings, forums, newsletter articles, and the Plan website to share information and gather feedback. The C&D presentations and feedback are compiled the "2011 Stakeholder Outreach and Responsiveness Summary" in Appendix C: Public Involvement.

Stakeholders generally supported third party certification of facilities. They also thought the C&D sector could achieve the overall citywide goal to recycle 70% of C&D by 2020--even with market fluctuations. As for overall strategies, they preferred the option that included landfill bans on target C&D materials, with project recycling reports due after getting a Final Permit. As in the first phase of stakeholder input, they did not favor linking mandatory recycling reports with Certificates of Occupancy.

Stakeholder Feedback Issues Highlights

- Need for flexibility in implementing the disposal bans on targeted materials, due to the volatility of end markets for certain commodities such as wood waste.
- Need for SPU to clearly spell out how it will carry out the education and enforcement phases of the materials bans. At construction job sites and transfer stations.
- Cost of compliance for smaller construction projects
- Adequacy of local recycling infrastructure for materials subject to disposal bans
- Importance of market development and public agency procurement of materials with recycled content
- Cost of third party certification to smaller facilities
- Coordination needed between public agencies involved with permitting
- Space constraints for multiple recycling containers at Seattle construction job sites. And whether a one-box option for all C&D (recyclable and not) would be permitted
- Differing perceptions of the 90/10 Hauling Rule. Some view it as a deterrent to recycling, others see it as an important tool for reducing "sham" recycling

For the Preliminary Draft version of the Plan, SPU modified the C&D recommendations to push out the start dates for disposal bans on metal, cardboard, and clean wood. This will give time to fully develop the certification program. The changes also allow time for wood waste end markets to recover from current volatility.

C&D Recommendations

Recommendations to increase C&D recycling include continuing programs and new initiatives, including bans. The new actions are needed to increase Seattle's C&D recycling rate. They mainly reflect the chosen set of programs in Option #4 of Table 5-3

Create Overall C&D Recycling Goal

Set a recycling goal of 70%, citywide, by 2020. Adding the recommended new programs will increase C&D recycling to the new goal. Forecasting on current "baseline" programs showed they'd only maintain current recycling levels.

Continue Existing Programs

Most baseline C&D programs link to waste prevention programs. They need to continue to achieve C&D recycling goals.

- **LEED and Built Green**: continue promotion and technical support for voluntary, industry-driven programs for material reuse and recycling
  - Work with U.S. Green Building Council to change what gets counted as recycling for waste diversion credits (e.g. no ADC)
- **Salvage**: continue and expand pre-demolition voluntary salvage assessments
- **Hybrid deconstruction**: develop training programs for hybrid deconstruction techniques for residential and small commercial structures. To reduce traditional demolition.

Implement Facility Certification

SPU will develop, with private processors, an "advanced level" facility certification process in 2012. The program's components will include:

- Expectations for facilities to achieve compliance with all applicable regulations
- Standardized verification methods for recording facility inputs and outputs
- Requirements to report on amounts and types of materials handled by the facility
- Minimum recycling levels
- Sampling protocol for residuals – measuring the percent of targeted materials left in the residual after processing
- Web page listing of certified facilities for contractors to use

Implement Disposal Bans on Target Materials

The city will ban certain C&D materials from being disposed as garbage in a landfill. They will phase in as shown in Table 5-5. Several of the targeted materials have similar bans in the MSW recycling recommendations, but with different timing.

Table 5-5
Seattle C&D Material Ban Schedule

Effective Year	2011 Status	Material
2012	Adopted	Asphalt Paving, Brick, Concrete
2013	Recommended	Metal
		Cardboard
		Plastic Film Wrap
		Carpet
		Scrap Gypsum from New Construction
2014	Recommended	Clean Wood
		Tear-Off Asphalt Shingles

All bans will begin with one year of education before the start of enforcement at construction job sites and facilities. The SPU Director will hold authority to delay or rescind disposal bans in the event of local recycling facility closures, or if end markets for targeted materials collapse. Work to develop and maintain end markets also overlaps with some of the work described in waste prevention Chapter 3.

Require DPD Permit Holders to Report

Construction and demolition contractors, as a term of their Seattle project permit, will need to file a recycling report after receiving their Final Permit. The report will document where materials from the project were taken.

5.1.5 Monitoring and Performance Measurement

The annual City of Seattle recycler reporting will be used to measure progress towards a 70% recycling goal for 2020. As a condition of certification, certified processing facilities located outside Seattle will also be required to report regardless of where they are located. The city will also gauge the effectiveness of its disposal bans for C&D materials at both the private and City of Seattle transfer stations.

A C&D Waste Stream Composition Study will be conducted in 2012 at the public transfer stations and in 2013 at the private stations, to set a baseline for the major components of the disposed C&D waste stream. The last waste composition studies for C&D were conducted in 2007 at the private stations, and in 2008 at the public stations. Studies after 2013 will be considered for C&D monitoring and program planning.

Construction sites and processing facilities will also be inspected to ensure that significant amounts of targeted materials do not end up in either disposal containers or disposal areas of transfer stations or recycling facilities.

5.2 HISTORIC LANDFILLS

Until the 1960s, Seattle disposed its solid waste at various landfills within the city limits. Between 1966 and 1986, the City of Seattle operated two major landfills south of Seattle: Midway and Kent Highlands. The Midway Landfill accepted garbage until October of 1983 and Kent Highlands Landfill through 1986.

Between 1986 and 1991, Seattle took its solid waste for disposal at King County's Cedar Hills Landfill. From 1991 to the present, the city ships its solid waste to the Oregon Columbia Ridge Landfill, which Waste Management owns and operates.

After Midway and Kent Highlands closed for accepting waste, they went through the process for environmental closure. During the 1980s, the U.S. Environmental Protection Agency (EPA) added the Midway and Kent Highlands landfills to its Superfund list as Washington State Department of Ecology leading Superfund sites. Cleanup undertaken through legally binding agreements with the Washington State Department of Ecology (Ecology) was completed at Midway in 1991 and at Kent Highlands in 1995. Cleanup for these two landfills cost more than $110 million. SPU continues to monitor the landfills per agreements with Ecology.

In 1984, Public Health - Seattle & King County assessed 12 historic landfills in Seattle. The study's objective was to determine if any public health problems existed at the sites. The assessment included sampling for the following:

- Methane gas
- Non-specific organic and non-organic trace gases
- Water quality (in seepage and surface water), including pH, temperature, dissolved oxygen, conductivity, and turbidity

The assessment concluded that no further action was needed at Green Lake, Judkins Park, the Arboretum, Rainier Playfield, and Sick's Stadium. It recommended specific actions for the remaining sites (Interbay, Genessee, Montlake, Haller Lake, West Seattle, South Park, and 6th Avenue South). The direct actions recommended in the 1984 study have been implemented or are underway.

Annual operating costs for all post-landfill closure activities are about $900,000. There are also landfill capital projects in the 6-year Capital Improvement Plan. Anticipated capital costs between 2011 and 2015 are shown in Table 5-6-and included in Chapter 6, Administration and Financing, section 6.3.

Table 5-6
Six-year Budget to Maintain and Monitor Historic Landfills in Seattle

Project	2011	2012	2013	2014	2015	2016
Kent Highlands Flare Replacement	$450,000	$50,000				
South Park Development	$690,000	$667,000	$10,082,000	$9,9,816,000		
Midway Flare Improvements		$46,000				
Historic Landfill Improvements	$25,000					
Backhoe Replacement	$200,000					
Kent Highlands North Pond Diversion	$10,000	$170,000				

5.2.1 Recommendations from 1998 Plan and 2004 Amendment

Recommendations	Status
1998 Plan	
Continue monitoring per regulatory agreements	Regular 5-year Ecology reviews of groundwater and surface water conditions at both landfills: • The 2008 Kent Highlands review validated current remedy protective of human health, and no specific actions required. • The 5-year review for Midway completed 2010 validated remedy is protective of human health and no specific actions required.
Consider options for recreation after 30-year monitoring period	Monitoring period still under way
Respond to problems at historic landfills case-by-case	Done
2004 Amendment	
Continue monitoring per regulatory agreements	Regular 5-year Ecology reviews of groundwater and surface water conditions at both landfills: • The 2008 Kent Highlands review validated current remedy protective of human health, and no specific actions required. • The 5-year review for Midway completed 2010 validated remedy is protective of human health and no specific actions required.
Perform an assessment of old in-City of Seattle landfills to determine if any additional work is needed	• Landfill gas monitoring and targeted gas control completed at Genessee 2006. Final report submitted to Public Health - Seattle & King County 2007 showed landfill gas controlled. • *South Park Landfill Agreed Order with Ecology* signed in 2008 to complete RI/FS studies to support upcoming final site remediation.
Safely manage Washington State Department of Transportation (WSDOT) and City of Kent construction activities that may affect these landfills	Addressed per next two items for 1) Relocate Kent Highlands leachate forcemain and 2) Refuse removal, etc. for WSDOT I-5 construction at Midway
Relocate Kent Highlands leachate force main, decommission some probes and wells per agreement with City of Kent construction of 228th Street	The Kent Highlands leachate forcemain crossing the Green River replaced 2006. The new line activated 2008 after the leachate pump station replaced.
Refuse removal, gas well removal and relocation of storm water facilities in preparation for the WSDOT I-5 construction at Midway	• Preliminary engineering for waste removal at Midway to accommodate WSDOT I-5 construction completed 2006. Project has been delayed due to lack of state funding for project. • Midway gas extraction wells on I-5 right-of-way removed in 2007 because no longer needed.
Complete discussions with Ecology per recent Kent Highlands review. Implement any required activity	Ecology concerns from the 2003 5-Year review addressed in subsequent 2007 work plan. As part of work plan, modifications to stormwater pond constructed to improve stormwater quality. Modifications successful and 2008 review for Kent Highlands validated current remedy protective of human health and no specific actions required at this time.
Continue to respond to questions on old in-city landfills	SPU continues to consult on city projects located on or adjacent to known historical landfills.

Other Actions Since 2004

The City of Seattle has made other improvements at the Kent Highlands and Midway sites:

- A failing storm drain at Kent Highlands partially replaced in 2009
- A new records retention facility constructed at Kent Highlands to maintain the administrative records for the Kent Highlands and Midway landfills in 2009
- Emergency generators purchased 2009 to allow continued operation of the gas extraction systems at Kent Highlands and Midway, leachate treatment and pump station at Kent Highlands, and the Landfill field office at Kent Highlands

5.2.2 Planning Issues

Both EPA and Ecology have adopted greenhouse gas reporting requirements. However, the requirements do not apply to historical landfills in Seattle. SPU will evaluate the applicability to the former Midway and Kent Highlands landfills and prepare the estimates in 2011.

The Potentially Liable Parties at the South Park Landfill have entered into an Agreed Order with Ecology to complete a Remedial Investigation/Feasibility Study for the site and select a permanent remedy under the Model Toxics Control Act. This work will continue through 2015. The cleanup of the city-owned portion of the landfill is part of the redevelopment of SPU's South Recycling and Disposal Station.

5.2.3 Current Programs

Dedicated SPU staff monitor the Kent Highlands and Midway sites and facilities for:

- Gas extraction and flare system, to ensure proper operation cover and perimeter security, inspecting to ensure they are intact, including general maintenance
- Surface water quality testing
- Groundwater sampling and reporting, and ensuring the test wells are in good order
- Ensuring leachate discharge to the sanitary sewer meets permit limitations
- Pump maintenance, for groundwater, surface water, and leachate

SPU will replace the flare at Kent Highlands to better match decreasing landfill gas flows (scheduled for 2011). During the flare replacement, we will evaluate the alarm systems at all landfill pump stations for upgrades.

At the Interbay and Gennessee historic landfills, SPU crews operate and maintain gas control systems, and monitor and evaluate methane levels along site perimeters.

5.2.4 Alternatives and Recommendations

No major new initiatives are being considered for Seattle's historic landfills. Instead, it is more a matter of staying the course on the decisions and investments that have already been made. For the planning period, SPU will:

- Continue to monitor and maintain Kent Highlands and Midway in accordance with regulatory requirements and to the satisfaction of adjacent communities
- Reduce monitoring requirements as appropriate, with regulatory concurrence
- Continue to monitor and control landfill gas at Interbay and Genessee
- Respond to problems at historic in-city landfills on a case-by-case basis
- Pursue possible site de-listing and future beneficial use of the Kent Highlands and Midway landfill sites. In 2007, EPA funded and completed an evaluation of future uses of these sites. As development in the area increases, these sites may become viable for future economic development.

5.2.5 Monitoring and Performance Measurement

The Washington State Department of Ecology formally tracks landfill closure program performance for Midway and Kent Highlands in a 5-year review cycle. Public Health - Seattle & King County monitors performance at the historic Seattle landfills.

5.3 CLEAN CITY PROGRAMS

Clean City is a set of programs that provides tools to abate graffiti, illegal dumping, and litter. The programs are an extension of traditional City of Seattle solid waste services for keeping streets and neighborhoods clean and healthy by collecting garbage and encouraging environmental awareness. Clean City programs

- Make Seattle a more livable place by creating cleaner and more secure communities
- Encourage urban stewardship

5.3.1 Recommendations from 1998 Plan and 2004 Amendment

The key goal for the Clean City programs is to keep Seattle's neighborhoods clean and safe by partnering with communities. A key objective was to increase the efficiency and fairness of services.

The 2004 amendment included three strategic focus areas for Clean City programs:

1. Maintain existing service levels for graffiti removal, litter pick up, and response to illegal dumping
2. Evaluate strategies for increasing efficient, effective, and equitable service delivery
3. Fully implement the public place recycling program

See section 5.3.3, Current Programs and Practices, for more detail on progress on these areas.

5.3.2 Planning Issues

Clean City programs face two major challenges. First, City of Seattle general tax revenues pay for the programs, making the programs compete with other General Fund activities, such as public

safety and human services. SPU projects significant ongoing budget shortfalls in the years following the recession, which may result in resource restrictions for the Clean City programs.

Second, increasing population diversity, including minority and immigrant communities and non-English speakers, increases the challenge of ensuring equitable services to all citizens. Program messages must include and be delivered in culturally relevant ways. The goal of such messaging is to promote collaboration and civic engagement that include a wide range of Seattle's diverse populations.

At the same time, the City of Seattle's anti-graffiti program may benefit from other recent developments. Ongoing interdepartmental and inter-agency collaboration may leverage results for cleanup, outreach, and apprehension. Program enhancements may include recruiting more volunteers for graffiti cleanup, and strategic partnerships for outreach to repeatedly tagged areas and increased surveillance and apprehension.

5.3.3 Current Programs and Practices

Clean City programs are grouped into four areas: anti-graffiti, illegal dumping, litter, and community cleanup.

Anti-Graffiti

The success of the anti-graffiti program relies on cooperation and rapid abatement (removal or painting over) by the various responsible parties. Those involved in graffiti abatement include public and private property owners, volunteers, non-profit and community organizations, city departments, and other government entities. SPU provides five main, ongoing roles:

- **Hotline —** The Hotline is a citywide central point for reporting graffiti on public property, or on private property where the graffiti has persisted for a period of time. Customers may reach the Hotline through the online graffiti report form, or by calling the graffiti report line at (206) 684-7587. Hotline staff route public property reports to the entity responsible for abatement, or to code enforcement staff who are responsible for graffiti nuisance. Hotline staff are required to dispatch reports within 1 business day.
- **Abatement —** SPU's "Graffiti Rangers" abate graffiti on SPU-assigned properties. The Graffiti Rangers take care of reported graffiti and any they discover while working within specified geographic boundaries. Abatement includes painting, chemical removal and sandblasting. The citywide abatement performance target for obscene and hate graffiti is 1 business day. The performance targets for other reported graffiti are:
  - 90% of reports on SPU-assigned properties (light poles, street side litter cans, etc.) cleaned up within 6 business days of receiving the report
  - 90% of reports on roadway structures (bridges, retaining walls and stairwells) cleaned up within 10 business days of receiving the report
- **Enforcement —** Enforcement of the city's graffiti nuisance code (SMC 10.07) follows a prescriptive code process. The process uses pre-determined step-by-step actions that are applied the same to all. It requires property owners to promptly abate graffiti or be subject to fines. The performance target for enforcement staff includes identifying the property owner(s) and initiating the code notification process within 5 working days of receiving a hotline report.

- **Anti-graffiti Outreach and Education —** Outreach and education includes recruiting volunteers and coordinating abatement and community outreach activities. Program staff track and report the number of volunteers, volunteer hours dedicated to abatement efforts, and a summary of community outreach efforts.
- **Business Improvement Area (BIA) Grants** — BIA grants provide supplemental funding for cleaning contracts for graffiti removal within BIA areas.

Anti-Graffiti Progress on Recommendations

The anti-graffiti program has made good progress within the three focus areas outlined in the 2004 amendment:

- Service levels have been upgraded so that all city departments share common performance targets
- Strategies to improve service equity have been evaluated and implemented
- Efficiency and effectiveness strategies have been evaluated and implemented

The following initiatives benefitted the anti-graffiti program and the illegal dumping program:

- **Benchmark Studies** — Assessed programs in peer communities, identified best management practices, and incorporated program improvements based on studies.
- **Database Development** — Improvements 1) eliminated system problems that hindered staff productivity, 2) resolved issues of quality, duplication, and incompleteness, 3) automated work orders, and 4) automated tracking reports that were previously manual processes. Reports now support strategic objectives of trustworthy data and easier data sharing.
- **Report Hotline** — Upgraded reporting phone line to be answered live during normal business hours.

To evaluate service delivery, staff mapped service provision by geographic area to assess if service delivery is equitable across Seattle communities. Focusing work within geographic sectors continues. See this chapter's section on Illegal Dumping, for more detail.

Anti-Graffiti Program Changes

Since 2004, several city events resulted in anti-graffiti program changes not anticipated in the 2004 amendment. These events changed SPU's services as follows:

- Due to General Fund reductions, SPU was directed to incorporate graffiti abatement on roadway structures in 2006. The roadway structures work is a significant amount of the Graffiti Rangers' workload.
- The 2007 to 2008 budget process resulted in added functions, but not as requested. The original budget proposal included funding for a citywide 48-hour graffiti cleanup policy on public property, by adding General Fund resources to multiple City of Seattle departments. While the budget was maintained for SPU, the budget for additions in other city departments was cut. Rather than

enhance the service level for SPU only, the additional SPU resources upgraded the graffiti hotline to a live operator (from a voicemail system) and incorporated one staff position to focus on education and graffiti prevention.

- In 2008, the Mayor's Office sponsored a Customer Service Improvement project, which focused on graffiti removal on public property. A task force developed recommendations to provide external customers a more responsive and consistent approach to graffiti removal across city departments. Specific recommendations that affected SPU services include:
  - Promotion of the Graffiti Report Line (Hotline) as the central citywide reporting conduit
  - Establishment of common service levels across city departments. This resulted in a more aggressive performance target (from 10 business days to 6 business days) for most public infrastructure
  - Establishment of common metrics across city departments
  - Development of ongoing, regularly-scheduled interdepartmental meetings of dedicated field abatement staff to coordinate efforts and discuss challenges and opportunities

Illegal Dumping

Illegal dumping program staff respond to reports of illegally dumped materials on public property and coordinate cleanup with Washington State Department of Corrections (DOC) work crews. The program's performance target is to clean up 90% of all reported illegal dumping within 10 days. Program staff also track and report the pounds of garbage and recycling collected by DOC crews. Seattle's Department of Planning and Development (DPD) responds to waste accumulation and "junk storage" issues on private property.

Illegal Dumping Progress on Recommendations

Most of the illegal dumping program's progress on the recommendations from the 2004 plan is described above under Anti-Graffiti, including benchmarking, hotline improvements and database development. Additionally, this program found ways to leverage resources by developing an interdepartmental agreement for cleanup of illegally dumped materials too large or heavy for regular (DOC) cleanup crews.

Illegal Dumping Changes

SPU sponsored a customer service pilot project that was not planned in the 2004 Amendment. To improve clean up efficiency, illegal dumping staff developed and implemented a "direct dispatch" pilot. Direct dispatch meant sending out cleanup crews before the reported illegal dumping sites were inspected. The pilot lasted 8 months, ending after an evaluation phase. DOC crews were able to clean up only 31% of the direct-dispatch cases, resulting in lower productivity for all DOC cleanup cases. The pilot also resulted in putting higher priority on cleaning up mundane and non-hazardous items such as mattresses, sofas, and chairs. These types of cleanup cases are the most fitting to defer while cleaning up cases that are more complex, or potentially hazardous to human health and the environment.

Litter

SPU provides several programs designed to reduce ground litter and/or provide disposal options for incidental litter. Programs include:

- **Adopt-a-Street** — offers residents, businesses, and community groups tools to collect ground litter. Volunteers can conduct a one-time cleanup or agree to adopt 1 mile or more for a minimum of 2 years. The city provides collection supplies, free solid waste disposal, and street signs that credit 2-year adopters. Program staff track and report the number of Adopt-a-Street volunteers, and volunteer hours dedicated to ground litter collection.
- **Street Side Litter** — provides collection and disposal of garbage put in containers located along city streets in business areas. Program includes about 900 collection cans for litter from pedestrians. Program staff track and report the total number and location of collection cans, service frequencies and contractor performance (number of missed collections).
- **Public Place Recycling** — program in Seattle business areas, to strategically pair street side litter cans with a recycling option for beverage containers. About one-third of all street side litter cans are paired with a recycling can. Program staff track and report the total number and location of collection cans, number and location of cans that exceed acceptable contamination level, and contractor performance.
- **Litter Collection in Parks** — provides collection and disposal of publicly-generated garbage placed in more than 3,000 cans located in city parks. Collects recyclables from select locations in outdoor open spaces. Program also supports ground litter collection in downtown retail core parks. SPU and Seattle Parks and Recreation have developed a detailed agreement that identifies costs related to these services. The agreement requires tracking and reporting of costs associated with labor, equipment, and materials.
- **Secured Load Requirements** — Roughly 40% of litter on Washington State highways comes from unsecured loads, or vehicle loads that are not tied, covered or properly confined. In addition to creating litter issues, road debris causes about 400 accidents on Washington State highways every year. To reduce litter and road debris, state and local law requires vehicle operators to secure loads to prevent spillage while the vehicle is moving (RCW 46.61.655 and SMC 21.36.450). Vehicle operators will be charged an additional fee at all Seattle and private transfer stations for unsecured loads.

Litter Progress on Recommendations

Progress on the 2004 recommendations includes maintaining service levels and improving service delivery:

- **Parks Litter —** Assessed program to determine costs and developed clear and detailed scope of work. Worked to document responsibilities and associated funding into formal agreement.
- **Streetside Litter —** Developed guidelines for can siting and reallocation. Transitioned collection to the City of Seattle's solid waste contractors to increase efficiency.

A further recommendation was to fully implement the public place-recycling program. SPU's 2003 plan to reach 60% recycling committed us to fully implementing this recycling program. The program pairs, in heavy pedestrian areas, about 300 streetside litter cans with cans that accept beverage containers for recycling. While public place recycling recovers a small quantity of recyclables, its value is in the enhanced visibility of recycling.

Litter Changes

In 2007, the Mayor and City Council requested that SPU and Seattle Parks and Recreation (Parks) jointly develop and submit a plan to guide recycling efforts within City of Seattle parks. A system-wide assessment revealed outdoor open spaces offered the fewest opportunities for patrons to recycle in Seattle Parks. As a result, SPU and Parks ran a pilot project in 2008 in selected outdoor open spaces to assess program and cost effectiveness. The project collected co-mingled beverage containers, including aluminum, plastic and glass, in designated south region parks.

The pilot project, which collected 19.1 tons of recyclable material, was costly. In general, an outdoor open-space recycling program compares unfavorably with other possible recycling programs. The pilot's price per recycled ton proved high compared to other possible programs. In addition to being more cost-effective, other potential programs could yield more recycling and greater environmental benefits. The pilot project resulted in designing a more cost-effective citywide outdoor open-space recycling program that:

- Integrates collection of recyclables into regular duties of staff who are already conducting work activities in parks
- Locates cans in higher volume locations, including ball fields, park entries or kiosks, boat ramps, and picnic shelters
- Offers the program on a seasonal basis only (stores cans during non-peak seasons)

Community Cleanup

The fourth program area, Community Cleanup, includes a group of programs that provide resources to help community members clean up litter, illegal dumping, and graffiti themselves :

- **Spring Clean** — an annual program (typically April through May) that supports community-developed projects within the public right-of-way and on other city-owned parcels. SPU provides supplies, including trash bags, safety vests and gloves, and trash disposal for the collection projects. Program staff track and report the total number of projects, number of volunteer hours dedicated to cleanup, and estimated number of pounds of materials collected.
- **Home Cleanup** — aims to reduce illegal dumping by providing a coupon to qualifying households for one annual free-of-charge disposal of up to 500 pounds of garbage at the City of Seattle's transfer stations. Program staff report numbers of coupons sent to customers and numbers redeemed and pounds of material disposed of by program participants.

- **Senior Assist —** provides seniors with one annual free-of-charge service for disposal of up to 500 pounds of garbage. Program metrics include tracking and reporting number of seniors served.

Community Cleanup Progress on Recommendations

The key action in response to the 2004 Plan's recommendations for this program was revising the coupons. Coupons now allow free transfer station drop-off to increase accountability and coordination among stakeholders. Better controls also reduce risk of unintended revenue loss at the transfer stations.

Community Cleanup Changes

There have not been significant changes to the Community Cleanup programs in addition to those planned in the 2004 Amendment.

5.3.4 Alternatives and Recommendations

The following section describes near- and longer-term changes to Clean City programs.

Anti-Graffiti

Building on the 2008 Customer Service Improvement project, a follow-on task force focused 2009 to 2010 on graffiti on private property. The group was asked to:

- Review current anti-graffiti code, enforcement protocol and support (outreach, technical assistance, etc.) related to private property
- Develop recommendations for improvement

Select recommendations include enhancements to encourage reporting, translation of outreach materials, and development of strategic partnerships to leverage resources. The recommendations were further developed and implemented in 2010.

The Seattle Office of the City Auditor (OCA) conducted a performance audit of the City of Seattle's anti-graffiti efforts. The audit compared the city's efforts to best practices and made recommendations for potential improvements. Implementation of several audit recommendations that affect SPU's anti-graffiti services include:

- Amend the Seattle Municipal Code (SMC 12.A.08.020) to include stickers in the list of prohibited materials
- Redeploy abatement resources across city departments to better address graffiti abatement on multi-space parking pay stations
- Enhance community involvement and public education activities by developing a comprehensive community outreach and engagement plan and convening an anti-graffiti outreach coalition

To better determine customer satisfaction with SPU anti-graffiti program services, a customer satisfaction tool will be developed and launched.

Illegal Dumping

A 2009 study included several alternatives for improving the illegal dumping program. Recommendations include further development of enforcement protocol, additional staff training, and expanded use of the existing database.

Litter

King County Metro Transit policy requires them to provide their bus shelter structures with litter can service as well as a host of other scheduled maintenance services, such as sidewalk power washing. However, the City of Seattle is spearheading a center-city bus zone conversion, which converts bus shelter zones to canopy bus zones when private property is redeveloped. These canopies are an integrated element into a new or redeveloped building's streetside façade, so that a traditional bus shelter is not needed.

Currently no formal rules lay out roles and responsibilities for these new canopy zones. Once a canopy zone is built and Metro stops maintenance, these activities shift to the property owner/manager, the City of Seattle, or the Metropolitan Improvement District (MID). Formalized roles, responsibilities and design standards for the bus zone transition projects need to be developed to ensure adequate litter services are provided.

Longer-term program changes may include:

- **Graffiti —** Increased emphasis on prevention, apprehension and prosecution and interdepartmental/inter-agency collaboration.
- **Illegal Dumping —** Increased emphasis on enforcement

5.3.5 Monitoring and Performance Measurement

Program staff track the performance of all Clean City programs by specified metrics and customer service levels. They report monthly and/or quarterly to SPU and other City of Seattle leaders. Specific programs are evaluated to find efficiencies and to ensure effective and equitable service delivery.

5.4 MODERATE RISK WASTE

Moderate risk waste (MRW) is hazardous waste generated by residents and in small quantities by businesses and institutions. Revisions to Washington State's 1986 Hazardous Waste Management Act (RCW 70.105) defined MRW. MRW includes two categories of waste:

1. **Household hazardous waste** (HHW), which is generated by residents, and
2. **Conditionally exempt small quantity generator waste** (CESQG), which is generated in small quantities by businesses, schools, and other institutions. This term refers to both the waste and generator of that waste.

These wastes include many common materials—cleaning, yard care and automotive products—that contain toxic, flammable, reactive, or corrosive ingredients. Seattle Municipal Code (SMC 10.76.010) prohibits disposing HHW and CESQG waste in garbage. Disposed of improperly, these products can pose a threat to human health and the environment.

The Local Hazardous Waste Management Program in King County (LHWMP) manages HHW and CESQG materials in Seattle. The LHWMP is a regional intergovernmental program jointly managed by the City of Seattle, King County, Public Health - Seattle & King County, and the county's suburban cities. LHWMP's mission is to protect and enhance public health and environmental quality in King County by reducing the threat posed by the production, use, storage, and disposal of hazardous materials.

5.4.1 Recommendations from 1998 Plan and 2004 Amendments

All cities and counties in Washington are required to develop plans to manage HHW and CESQG waste (RCW 70.105). In the 1980s, the City of Seattle and other local governments within King County recognized the need to address MRW in a comprehensive, regionally-coordinated manner. Seattle codified its support of a regional MRW management approach in 1991 with the adoption of the LHWMP's decision-making process and fee structure as outlined in the LHWMP's 1990 Plan (SMC 10.76.010).

Since 1991, the City of Seattle has participated in LHWMP's policy and decision-making bodies and has provided services for the program.

5.4.2 Planning Issues

The Local Hazardous Waste Management Plan for King County (1990) provides detailed plans for managing MRW. Updates to this plan were completed in 1997 and 2010. Major issues for the LHWMP include:

- Increased population, changes in the distribution of the population, and changes in the diversity of the population
- Increased awareness that segments of the population, including infants, young children, and pregnant women, are disproportionately vulnerable to toxic exposures
- Increased awareness that segments of the population, such as homebound, multi-family dwellers, and minority cultural communities, are underserved
- Sharp increases in the number, type and complexity of hazardous materials, chemicals and products
- Need to reduce the toxicity of products in their design and manufacturing stages
- Recognition that education and voluntary efforts alone will not achieve safe use, storage, and disposal of hazardous chemicals, products, and wastes

5.4.3 Current Programs and Practice

The Local Hazardous Waste Management Program provides a wide range of work, concentrated in three areas:

1. Reducing threats posed by the production of products
2. Reducing threats posed by the use and storage of hazardous chemicals, products and materials

3. Providing proper collection and disposal of hazardous materials

The partners in the LHWMP provide services and programs, which are available to all King County residents and CESQGs. Specifically, the City of Seattle provides the following LHWMP programs.

- **MRW Collection and Disposal —** SPU operates and maintains two fixed MRW collection facilities that accept waste generated by residents and CESQGs. In addition, SPU staff provide home collection services for the elderly and homebound. Used motor oil and filters are also collected at SPU transfer stations. Some products with a low potential for environmental harm and low toxicity, such as motor oil, car wax, or furniture polish, are available to the public at the site where they are collected.
- **Pesticide Use Reduction —** SPU staff serve as regional experts for natural yard care and pesticide reduction programs. Integrated pest management (IPM) is promoted with private landscape businesses, including non-English speaking gardeners and landscapers, and commercial nurseries. SPU staff and contractors train horticulture students and neighborhood communities. The Garden Hotline provides specialized information to residents and businesses.
- **Environmental Justice Network in Action (EJNA) —** SPU recognizes the need to address historically underserved populations. Our staff works directly with community-based organizations to communicate and deliver services to minority cultural groups or English-as-second-language populations.
- **Product Stewardship —** SPU works with other local, state, and regional governments and agencies, businesses, and non-profit groups to implement product stewardship programs to manage hazardous materials. Current efforts include development and support of statewide legislation for mercury-containing lamps and tubes and paint.

Other partner agencies implement an array of additional programs and services that are available to Seattle residents and CESQGs. These programs include technical assistance to businesses, hazardous materials exposure reduction for children, and the EnviroStars business recognition program.

5.4.4 Alternatives and Recommendations

To address changes that have occurred within King County, the LHWMP has committed to:

- Monitor and assess SPU-operated MRW collection services to provide the maximum number of service hours possible
- Collect materials from CESQGs on an on-going basis
- Expanded outreach for hazardous materials collection services, and provision of targeted outreach to the elderly, homebound, non-English speaking population, and historically underserved communities
- Working to secure state product stewardship legislation for unwanted medicines, mercury containing lighting and paint

5.4.5 Monitoring and Performance Measurement

LHWMP staff has developed a project monitoring and performance measurement framework to facilitate evaluation and assess effectiveness. For additional information, see Chapter 10 Performance Measurement and Evaluation in the 2010 update to the Local Hazardous Waste Management Program in King County.

The LHWMP website provides additional information on all aspects of the program. Or contact the Office of the Program Administrator, Local Hazardous Waste Management Program in King County, 150 Nickerson Street, Suite 100, Seattle, WA 98109-1658.

5.5 SPECIAL WASTES

This section is about wastes not allowed in the regular municipal solid waste (MSW) system, but not hazardous enough to qualify as "Dangerous" under state or federal law. Federal, state, and local regulations ban dangerous wastes from garbage. These wastes are generally toxic, hazardous, and industrial. The Washington State Department of Ecology regulates dangerous wastes and should be contacted for guidance on dangerous waste management.

Special wastes require special handling and disposal due to regulatory requirements or other reasons such as toxicity, volumes, or particular handling issues. In some cases, special wastes can be landfilled if properly managed.

5.5.1 Recommendations from 1998 Plan and 2004 Amendment

The 1998 Plan and 2004 Amendment described standard practices for certain special wastes: tires, asbestos, biosolids, biomedical waste, dangerous waste, and contaminated soils. Neither document contained new policy or programmatic recommendations for special wastes.

5.5.2 Planning Issues

Special wastes do not presently cause problems in the City of Seattle's MSW system. Seattle's most recent waste sorts have found minimal presence of special wastes. Waste and recycling receiving facilities have not expressed increasing issues with special wastes.

5.5.3 Current Programs and Practices

This current plan update may be used as a starting reference for the community for questions about special wastes. In some cases, these wastes are accepted in Seattle's system. For all else, SPU maintains awareness and up-to-date information for referring citizens to the proper authority.

Table 5-7 lists some special wastes of historical and current interest, with some guidance on their handling. The agency that regulates the waste should be contacted for direction on its proper handling. See the SPU website for more information on what to do with special and hazardous materials. See also King County's "What Do I Do With..?" web pages.

Table 5-7
Special Waste Programs in Seattle

Material	Comments/Contacts
Tires	• Banned from garbage • If separated, up to four per trip allowed at City of Seattle transfer stations for a fee • Also collected privately • Mostly shredded for industrial fuel • For other disposal options, see King County's "What do I do with..?" website
Appliances (including old refrigerators, freezers, air conditioners)	• Banned from garbage • Recycling ensures any problem materials in them are properly managed (for example, CFCs in coolant and PCBs in capacitors) • Contact SPU for Bulky Item Pick Up for a fee, or up to two accepted at City of Seattle transfer stations for a fee. • For other disposal options, see SPU's special materials web pages or King County's "What do I do with..?" website
Asbestos	• Not accepted at SPU transfer stations or at MRW facilities • For removal and disposal options, see SPU's special materials web pages or visit Puget Sound Clean Air Agency or call (206) 343-8800
Biosolids (treated sewage sludge)	• Seattle's sewage goes to King County's wastewater treatment plants • Managed by King County
Biomedical wastes	• For options on disposing sharps (syringes), see SPU's special materials web pages • Accepted from residents at SPU's transfer stations if properly prepared • Do not dispose of leftover medicines in the garbage or down the drain or toilet. Some pharmacies have a medicine take-back program • For other biomedical waste banned from garbage, call Public Health - Seattle King & County at 206-205-4394
Contaminated Soils	• Large quantities can be accepted at City of Seattle transfer stations for a fee, if accompanied by a Waste Clearance form from Public Health - Seattle & King County. Call 206-263-8528 • See SPU's special materials web pages for other disposal options
Electronics (TVs, computers, other consumer electronics)	• Banned from garbage • SPU provides Seattle residential service for a fee (206-684-3000). • Statewide free TV and computer drop-off or call 1-800-RECYCLE for locations • For cell phones, stereos, VCRs, printers, computer mice and keyboards, ask where purchased. Check Take It Back Network
Batteries	• Alkaline, rechargeable, button, vehicle: Accepted at household hazardous waste facilities. • Alkaline: Accepted in garbage • Rechargeable: Banned from garbage. Ask where purchased or check for recycling locations at Call2Recycle or 1-800-BATTERY • Vehicle: Banned from garbage. Accepted for recycling at city transfer stations for free
Fluorescent bulbs and tubes	• Contain mercury • Banned from garbage • Check where purchased or Take It Back Network • For broken bulbs, follow Ecology precautions
Used Motor Oil	• Curbside collection for recycling available to residential customers free Uncontaminated in sealed 1-gal containers, up to 2-gal • Up to 5 gal and oil filters per trip accepted at City of Seattle transfer stations
Latex Paint, Latex Stain	• Accepted in garbage if solidified

Screening for Special Wastes

The City of Seattle's transfer stations workers screen for prohibited wastes entering the facilities. Signage at the scale houses and throughout the stations informs users of the prohibited wastes. Workers visually observe all loads and deny access to vehicles carrying prohibited wastes. If prohibited material does get in, employees remove it from the tipping areas (if they can do so safely) or otherwise make sure the material is appropriately managed.

The Columbia Ridge Landfill, in Arlington, Oregon to which Seattle sends its garbage, prohibits certain wastes, including:

- Discarded or abandoned vehicles
- Hazardous wastes
- Lead-acid batteries
- Liquid wastes
- Large metal appliances
- Source-separated recyclable materials except if contaminated
- Used oil
- Whole tires

The City of Seattle's transfer stations collect many of these waste types, such as used oil, lead-acid batteries, whole tires, and large metal appliances for recycling.

Landfill staff are trained in material identification and proper procedures in the event they find banned materials.

5.5.4 Alternatives and Recommendations

SPU will continue to maintain up-to-date referral information for special wastes. We will also continue programs to create better end-of-life solutions for problem materials, as Washington State has done for fluorescent lighting and consumer electronics. See Chapter 3, Waste Prevention, for a discussion of those programs.

5.5.5 Monitoring and Performance Measurement

SPU will continue to screen for prohibited wastes at the transfer stations, as will staff at the Oregon landfill. If it appears more prohibited wastes are entering the system, we will evaluate the problem and take appropriate action. The first course of action would be to increase public awareness through education programs.

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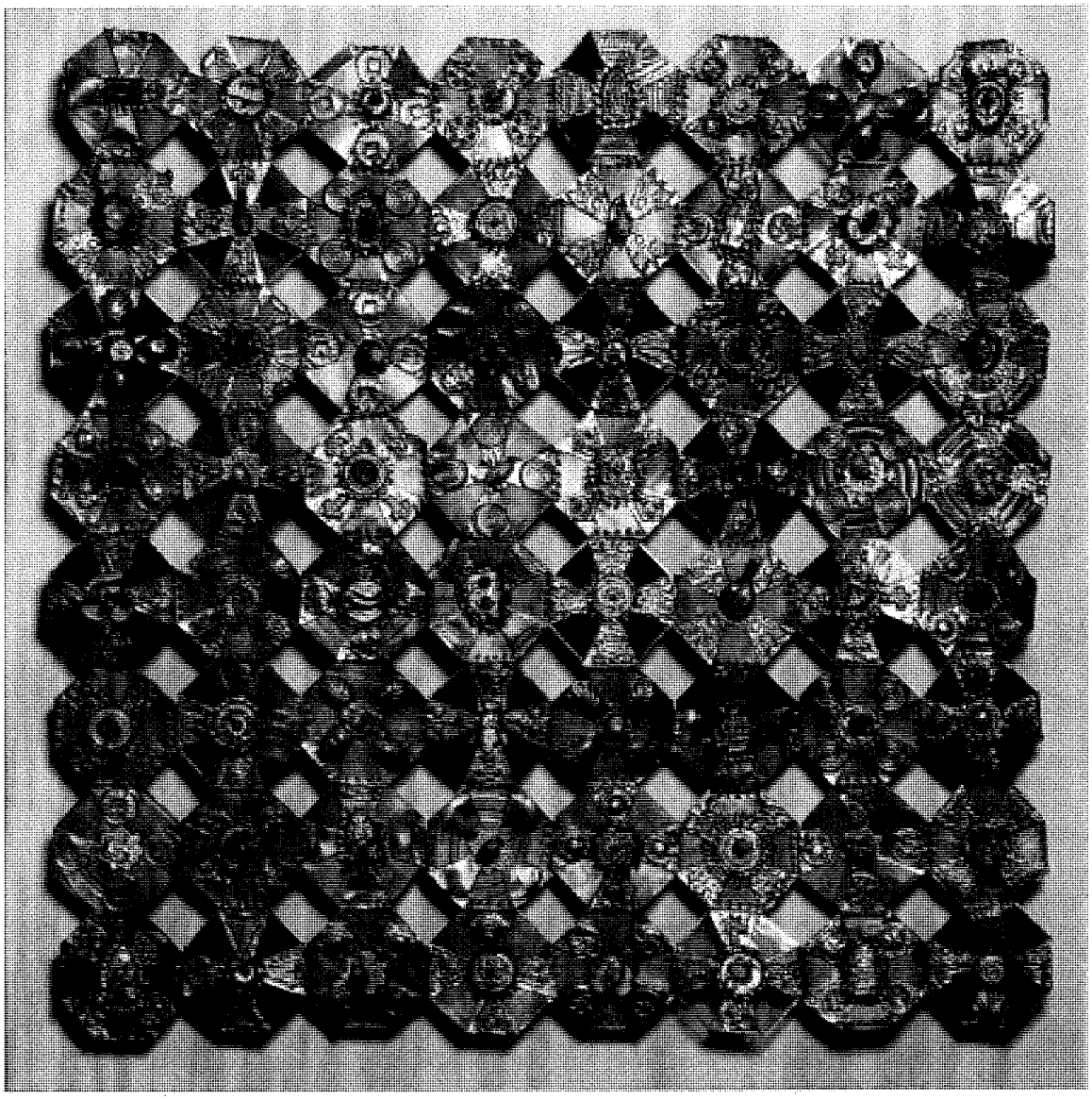


Chapter 6 ADMINISTRATION AND FINANCING THE PLAN

6.1 ORGANIZATION AND MISSION OF SEATTLE PUBLIC UTILITIES

Seattle Public Utilities (SPU) is a department in the City of Seattle. It is composed of three major direct-service providing utilities:

- **Water Utility** provides more than 1.3 million people with a reliable supply of clean and safe water for drinking and other uses.
- **Drainage and Wastewater Utility** collects and conveys the city's sewage and stormwater.
- **Solid Waste Utility** functions are described throughout this document.

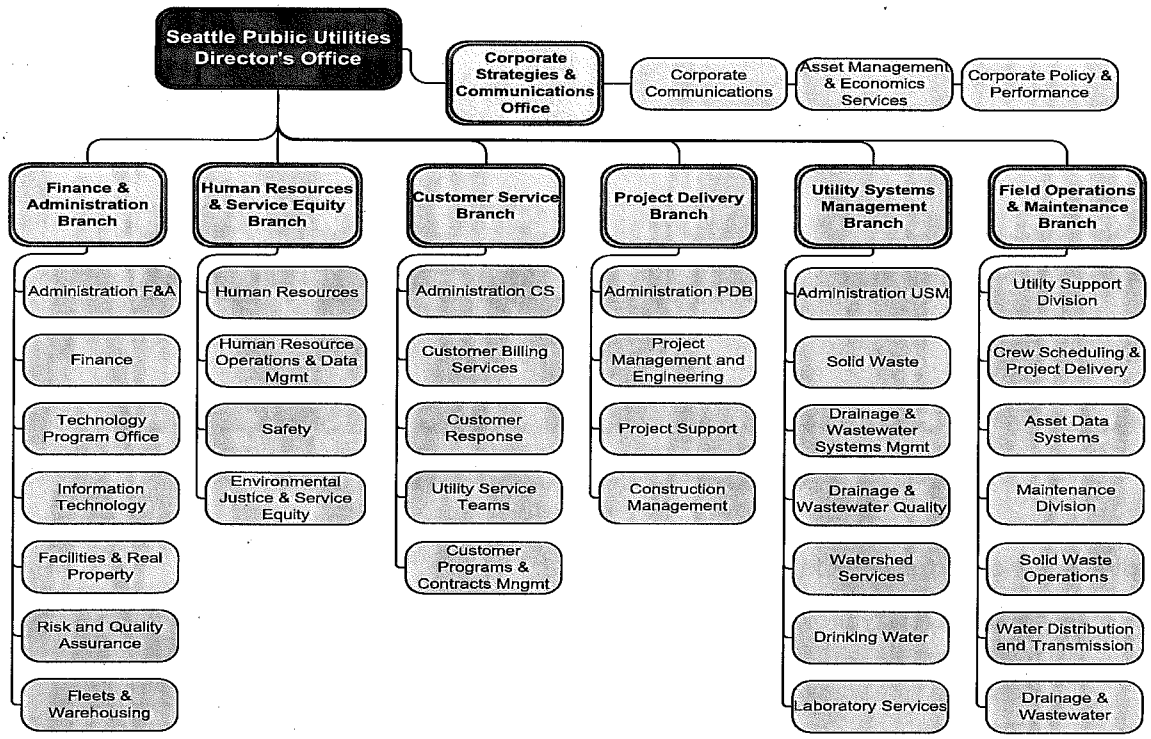
SPU Mission

We provide reliable, efficient and environmentally conscious utility services to enhance the quality of life and livability in all communities we serve.

6.1.1 ORGANIZATION STRUCTURE

SPU consists of seven branches or offices. Each office has a role in carrying out solid waste management functions (Figure 6-1).

Figure 6-1
SPU Organization



Director's Office

The Director of SPU leads the organization following policies set by the Mayor and the City Council. The Corporate Strategies and Communications Office assists the Director in designing and carrying out policy, strategy, analyses, community relations, and internal and external communications. The Office focuses on issues, initiatives, and agreements involving all SPU's lines of business, other departments and governments, and the public.

Finance and Administration Branch

The Finance and Administration Branch houses the financial functions of SPU, including, accounting, budget, and rates. This branch also takes care of information technology, real property, risk management, and fleets and warehousing for all of SPU.

Human Resources and Service Equity Branch

In addition to carrying out SPU's human resource functions, this branch also includes the department's Environmental Justice and Service Equity division (EJSE). EJSE makes sure that SPU's projects, programs, and services do not disproportionately affect human health and economies in communities of color, low-incomes, immigrants, and refugees. EJSE also ensures

that SPU programs, projects, and services are done in ways that fairly spread benefits across all communities.

Customer Service Branch

The Customer Service Branch is responsible for most of SPU's regular customer contact. Specifically, for solid waste this branch does the following:

- **Customer Billing Services** manages all SPU's bills to customers.
- **Customer Response** includes the call center, where customers call with questions and requests about their service.
- **Utility Service Teams** is the division that includes the solid waste inspection team.
- **Customer Programs and Contracts Management** is responsible for carrying out many of SPU's programs, such as materials market development, and implementing programs such as Food Plus.

Project Delivery Branch

The Project Delivery Branch carries out approved capital projects. The branch provides SPU's engineering design and support services, construction inspection, and project management services.

Utility Systems Management Branch

This branch is the main planning arm of the SPU. Within it, the Solid Waste Division ensures that the solid waste system and its assets are properly planned, developed, operated, and maintained. The Solid Waste Division further ensures that asset management principles and practices are applied to achieve customer and environmental service levels at the lowest life-cycle cost.

Field Operations and Maintenance Branch

Solid waste field operations and maintenance (O&M) are located in this branch. It includes the day-to-day functions of the transfer stations, the historic landfills, and the household hazardous waste facilities.

6.1.2 DECISION-MAKING IN SPU

In 2002, SPU began implementing a comprehensive asset management program. Asset management aims to ensure that a "triple bottom line" is fully considered when SPU makes decisions about SPU's programs and assets. The triple bottom line includes financial impacts, environmental impacts, and social impacts.

Asset management in SPU has focused mainly on capital (infrastructure) assets and projects. As success grows with the asset management approach, we will apply it to more non-capital (programmatic) decisions.

6.2 EDUCATION

SPU places high priority on customer education in recycling and waste reduction. We provide solid waste services for more than 390,000 multi-family units, single-family households and businesses, who generate more than one million tons of MSW and C&D waste each year. Educating our customers about the impacts of their behavior and highlighting the programs available to them has helped develop the city's identity as one of the greenest in the nation.

6.2.1 CUSTOMER SERVICE INFRASTRUCTURE

Many of Seattle's solid waste education efforts are built into SPU's customer service and overall communications. Overall communication provides utility information to all drainage, wastewater, water, and solid waste customers.

Call Center

In terms of sheer numbers, the chief means by which SPU interacts with its customers is through its 206-694-3000 phone number. Customers can get information about all SPU's programs and services, and access their own billing and service information.

Call center staff receive regular training on solid waste programs to help them provide quality customer assistance.

Newsletters & Calendars

SPU's most effective customer education tool is regular newsletters:

CurbWaste & Conserve — CurbWaste & Conserve is a 6-page newsletter published two to four times a year and sent to all 320,000 single- and multi-family residents who receive SPU services. The newsletter highlights SPU's environmental programs and offers tips to residents on how they can help the environment. A monthly e-mail version of the newsletter is also available.

@ Your Service — @ Your Service is a 2-page newsletter that is inserted with the SPU's 160,000 bi-monthly residential customer bills. The newsletter mainly focuses on service and billing changes.

Collection Calendars — SPU's single-family, multi-family, and small business recycling customers receive annual collection calendars that outline their collection and billing services. It gives tips on how to reduce and reuse, including pointers on what materials can be put in the recycling and composting.

The Web

SPU's website is the main information portal to all SPU programs and services. In 2010, the website generated 2,677,635 visits and 10,762,688 page views. The solid waste collection calendar is one of the most often accessed pages on the website.

In addition to summary descriptions of Seattle's solid waste services, the SPU website hosts planning documents, reports, informational brochures, and instructional videos and video games to help educate businesses and residents. The website also hosts a blog, Facebook, MySpace and Twitter pages for social networking.

Inspectors

SPU has a team of inspectors whose key role is to ensure that solid waste collection goes smoothly for all of Seattle's commercial and residential customers. In addition to following up on customer complaints and troubleshooting collection issues, the inspection team also works with the city's collection contractors to enforce customer compliance with Seattle's solid waste regulations.

Transfer Stations

The city's two recycling and disposal transfer stations offer education to their commercial and residential customers, mainly through talking to customers in person. The transfer stations also use their customer billing system, a low-power radio broadcast at each station, and brochures and signs on site to inform customers.

6.2.2 COMMERCIAL EDUCATION

Commercial customers receive billing and service information through their private collection service contractors. SPU staff, collection contractors, and non-profit agencies also develop and promote new programs.

Resource Venture

Most commercial solid waste education programs for Seattle are channeled through Resource Venture. Resource Venture is a contracted consulting service that specializes in providing free waste reduction, recycling, and composting audits to Seattle-area businesses.

Additional commercial education partners include Waste Management, CleanScapes, Cedar Grove, and many community-based organizations (SeaDruNar, Allied Waste, etc.), who are vital in helping SPU reach populations that speak languages other than English.

Key Accounts

SPU offers additional customer support to its largest 100 commercial customers through a key billing accounts team. Key accounts team members work to inform large commercial customers about upcoming impacts to their billing or services. They also help educate large commercial customers about the utility's environmental programs that are available to them.

6.2.3 RESIDENTIAL EDUCATION

Single-Family

With several programs that promote recycling and composting to its single-family customers, SPU relies on market research to develop messages that connect with and motivate its customers. We conduct several customer surveys a year. Feedback from customers has helped define which tactics are most effective when promoting solid waste programs. Direct mail and television news stories and advertising rank highest in terms of effective message delivery to single-family customers.

Multi-Family

SPU's multi-family education strategy hinges on empowering these property owners and managers so that they act as educators to their tenants.

SPU provides apartment and condo managers with an educational tool kit that allows them to order educational information in multiple languages for their tenants. The program also offers a one-time $100 credit on their utility bill if they sign up for a Friend of Recycling and Composting (FORC) stewardships. FORC stewards are a tenant or manager who, once trained, acts as an onsite solid waste educator to the building's tenants.

6.2.4 COMMUNITY OUTREACH

Engaging and partnering with public organizations is a key strategy in promoting SPU's solid waste programs. We partner with other city departments, school districts, local government, state and non-profit agencies to better serve our customers. Our customers include children, immigrants, and populations that speak languages other than English.

SPU also invites input from the public through its Solid Waste Advisory Committee, who provides opinion and analysis on solid waste issues, programs and services.

6.2.5 PUTTING PRACTICE INTO PLAY

In 2009, SPU improved its curbside residential recycling services to include more materials and to make recycling more convenient. Changes included the following:

- New collection dates
- No more sorting of glass
- Ability to recycle more items
- Weekly food and yard waste collection
- Increased food scrap recycling to include meat and fish

In addition, food and yard waste collection was established as a mandatory service for single-family homes, meaning that many people would be recycling food for the very first time.

The new solid waste services resulted in monthly rate increases for many customers. The new changes required Seattle residents to rethink the way that they handled their garbage, recycling, and yard waste. SPU expected that some customers would resist the changes, and especially the rate increase. All Seattle customers, particularly minority and underserved populations, needed equitable levels of service and attention.

Forming an interdisciplinary outreach team, SPU developed and implemented a communications plan to raise customer awareness and support for the service changes. The resulting "Better Recycling Starts March 30" Outreach Campaign was extremely successful. The campaign was highly visible and exceeded behavior change and awareness objectives set before program launch. Outreach tactics consisted of customer research, focus groups, mailers, community meetings, speakers bureau presentations, advertising, and media relations.

The challenge of providing information to English as Second Language (ESL) communities and other minority populations was addressed through a comprehensive media relations campaign targeted at minority radio, TV, and print publications. The campaign put special focus on food composting, because research showed food composting was hard for these groups to embrace.

Objective #1: Customers reflect an understanding of new service changes and are aware of their new collection day.

Result: To analyze the success of the outreach campaign, SPU surveyed Seattle residents by phone in May 2009. Of those surveyed, 82.6% were aware of the changes in garbage and recycling services. And 72.9% knew how to use the new services. Some 79% reported knowing their new collection day. A mini-survey conducted before service launch during the marketing campaign found that 94% surveyed recalled hearing messaging about the new recycling services.

Objective #2: Increase visits to the SPU website by at least 50% during March 2009 to provide residents detailed information about service changes and their new collection date.

Result: SPU reported 120,232 page views for its website in March 2009, an increase of 116% from March 2008. SPU's "Where Does it Go" recycling flyer received 33,000 page views in March and April, the highest-viewed SPU webpage during the same period.

Objective #3: SPU maintains satisfaction levels among residents during the service launch in March 2009.

Result: Campaign research indicated that not only was satisfaction with SPU maintained during the service change and rate increase, but customers were also more satisfied with SPU services after the change. Some 62.4% reported being satisfied with SPU services after the changes were introduced, up from 57.4% before changes.

Objective #4: Increase amount of food waste recycled by at least 25% in the first 4 months following the March 30 service launch.

Result: Curbside food recycling among Seattle residents increased 43% from March 2009 through August 2009. It peaked in April, May and June, the months following the campaign launch.

The Washington State Recycling Association recognized the City of Seattle with a Recycler of the Year Award for the Better Recycling Starts March 30 Campaign. The campaign also received a Silver Award of Excellence from the Solid Waste Association of North America.

6.3 FINANCING THE PLAN

This section describes Seattle's framework for managing solid waste system finances. It discusses methods of financing the solid waste system. It also projects the costs of operating the solid waste system and meeting City of Seattle waste reduction and recycling objectives.

6.3.1 FINANCIAL MANAGEMENT

Financial Policies

Financial management of Seattle's solid waste system is directed by two forces. One is through formal financial policies the City Council adopts. The other is by informal guidelines evolved over time in response to specific issues. SPU uses these policies and guidelines to decide how to finance solid waste system operations and capital projects. The goals of these policies are:

- To ensure the financial integrity of the solid waste utility
- To moderate rate increases for solid waste customers over the near and medium term
- To ensure an equitable allocation of capital costs between current and future ratepayers

The City Council adopted these financial policies in 2004:

1. **Net Income** — Net income should be generally positive.
2. **Cash Target** — Target for year-end operating fund cash balance is 20 days of contract payments for collection and disposal services.
3. **Cash Funding of the Capital Improvement Program** — A minimum of $2.5 million (in constant 2003 dollars) of the annual CIP should be funded with cash. SPU has adopted an informal policy of funding the greater of $2.5 million (in 2003 dollars) or 10% of the CIP in years of higher spending.
4. **Debt Service Coverage** — Debt service coverage on first-lien debt should be at least 1.7 times debt service cost in each year.
5. **Maintenance of Capital Assets** — For the benefit of both current and future ratepayers, the solid waste system will seek to maintain its capital assets in sound working condition.
6. **Variable Rate Debt** — Variable rate debt should not exceed 15% of total outstanding debt.
7. **Debt Structure** — As a general practice, the solid waste system will have level nominal debt service and will not defer the repayment of principal.

Financial policies help determine how much revenue SPU must collect from its customers each year to meet the cost of operations, maintenance and repair, and capital improvements. Accordingly, rates are generally set to meet the financial policies as well as to meet projected system-wide solid waste needs. Rate impacts stemming from specific courses of action recommended in this plan cannot be determined without first considering financial policies.

Financial Results

Financially healthy organizations have the flexibility to respond to unexpected circumstances. Such circumstances may include new, unexpected-but-essential tasks or a shortfall in earnings. Flexibility can mean redirecting expenditures, borrowing money to meet an unexpected need, or other approaches.

Debt service coverage is a key indicator used by the financial community that provides a measure of SPU's financial health. *Debt service coverage* is an annual measure of the revenue an organization has available to repay debt, divided by debt payments. SPU's debt-service coverage policy target is 1.70. SPU has well surpassed this target in the past, and we expect to meet the target in the period covered by this plan.

Credit ratings also reflect the financial health of an organization. They are an informed assessment of the long-term security of bond investments. Rating agencies take account of a variety of factors including:

- Financial policies
- Strength of the local economy
- Legal security
- Risk factors
- Comparative rate levels
- Management capability and performance
- Willingness of elected officials to raise rates

The City of Seattle solid waste system has excellent bond ratings.[1]

SPU has made a major commitment to using the asset management approach described in section 6.1.2 in its capital planning and budgeting. By adopting an asset management approach, SPU is better able to ensure cost effectiveness in service delivery in the long run. This cost effectiveness is reflected in SPU's financial results over the past 5 years (Table 6-1). With the exception of 2009 when the recession caused significant revenue losses, SPU has consistently met its financial targets.

[1]AA by Standard and Poor's and Aa3 by Moody's

Table 6-1
SPU Financial Results 2006-2010 (in millions of dollars)

Revenues and Expenditures		2006	2007	2008	2009	2010
Revenues						
Operating Revenues		112,474	121,930	124,343	135,641	150,906
Total Revenues		112,474	121,930	124,343	135,641	150,906
Expenses						
Operations and Maintenance (O&M)		88,035	91,207	91,169	116,812	120,904
Taxes		17,018	18,934	18,883	19,477	16,643
Interest Expense		1,531	1,471	3.051	2,613	2,512
Depreciation and Amortization		7,217	7,093	8,188	7,789	6,916
Total Expenses		113,081	118,704	121,291	146,691	146,975
Other Income (Expense)		115	196	3,589	2,490	2,055
Net Income		(1,212)	3,421	6,641	(8,560)	5,986
Financial Indicators						
Debt Service Coverage		4.21	5.28	4.36	1.80	5.05
	Target	1.70	1.70	1.70	1.70	1.70
Cash Balance		5,621	10,058	14,122	3,889	10,271
	Target	3,500	3,500	3,500	4,200	4,800
Cash Funding of the CIP		2,600	3,300	3,600	2,700	6,600
	Target	2,700	2,800	2,900	2,950	3,000

6.3.2 FUNDING SOURCES

Solid waste services are funded through the Solid Waste Fund, an enterprise fund established in 1961 by city ordinance. The primary source of funding for SPU's solid waste utility's operational costs are revenues derived from commercial and residential solid waste collection and disposal. To finance capital spending, SPU relies primarily on borrowing and to a lesser extent on rate revenues. The solid waste system is in a period of large capital improvements, with projects under way to upgrade both of Seattle's recycling and disposal stations. Accordingly, SPU will rely heavily on borrowing over the next few years.

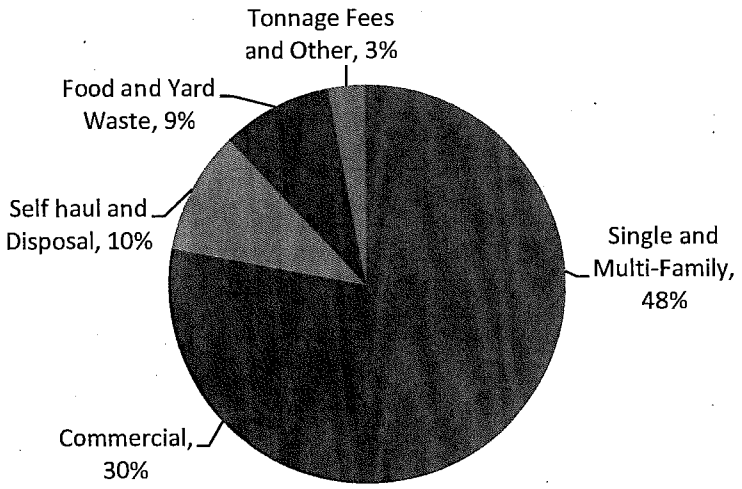
Solid Waste Revenue

There are four primary sources of operating revenue that fund Seattle's solid waste programs These programs cost $151 million to finance in 2010 (Figure 6-2):

- Residential collection rates charged to single-and multi-family accounts
- Commercial collection rates charged to business accounts
- Self-haul tipping fees charged to self-haul customers at the city's recycling and disposal stations
- Solid waste tonnage fees charged to all entities, including SPU, that are engaged in, or carrying on, the business of collecting and transferring non-recyclable solid waste

The fund also receives other miscellaneous revenues, including grants.

Figure 6-2
Seattle Solid Waste Revenue Sources 2010



Solid Waste Rates

Solid waste rates are developed by SPU and proposed by the Mayor for the City Council's approval. Rates are developed based on the following objectives:

- Provide financial soundness
- Advance economic efficiency
- Promote customer equity
- Encourage customer conservation
- Contribute to transparency and customer understanding
- Reduce impacts on low-income customers

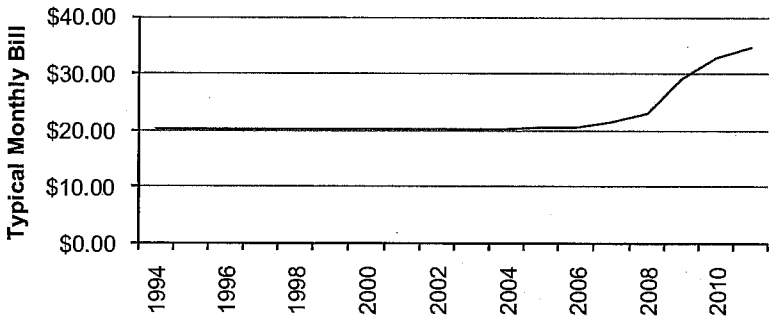
Affordability is also an issue considered during rate setting. In 2007 to 2008, SPU conducted an analysis that recommended ways to measure and improve rate affordability. SPU has already adopted the recommended changes to our low-income rate assistance program. See this chapter's discussion of low-income rate assistance.

Rates are set by customer class. All rates reflect a pay-as-you-throw structure in which rates increase as service levels increase. These variable rates are designed to encourage waste reduction and recycling.

The largest component of solid waste costs is O&M expense, including collection, processing and disposal contract costs, and transfer station operations costs. From 1994 until 2007, rate increases were relatively minor as those costs stayed relatively flat. However, since 2007 a series of rate increases have helped pay for significant cost increases in new contracts that started in 2009. Rate increases have also helped finance significant capital investments in transfer stations.

The typical single-family monthly bill includes a 32-gallon garbage can, a 96-gallon food and yard waste can, and a 96-gallon recycling cart (Figure 6-3).

Figure 6-3
SPU Single-Family Monthly Solid Waste Bills 1994-2011



Residential Rates

All Seattle residents are required to subscribe to garbage collection service. However, customers may choose the level of service they need. Residential customers receive every-other-week recycling service at no charge.

Can Customers

Most single-family and multiplex customers ("can customers") have curb or alley service. For an additional fee, can customers can elect to have back-yard-collection (Table 6-2).

Table 6-2
SPU Monthly Residential Can Rates 2011

Service Level	Monthly Rate
Micro Can	16.55
Mini Can	20.30
32-Gallon Can (and each additional)	26.40
Extra Bundle/Bag	each 8.10

Dumpster Customers

Residential dumpster service is available to apartment buildings with five or more residential units. Rates are set per container pick-up and vary with container size. Table 6-3 shows typical residential dumpster service levels and their monthly rates.

Table 6-3
SPU Monthly Residential Dumpster Rates 2011

Service Level per Container Weekly Pick-Up (Uncompacted)	Monthly Rate
1 Yard	$195.34
2 Yards	$267.87
3 Yards	$340.39

Food and Yard Waste Service

Residential customers also have curbside food and yard waste collection (Table 6-4). Before 2009, the service was voluntary with a flat monthly fee. In 2009, the service became mandatory for can customers, and two additional can sizes were added. Residential dumpster customers may also elect to subscribe to this service.

Table 6-4
SPU Food and Yard Waste Collection Rates 2011

Service Level	Monthly Rate
Mini Can	4.35
32 Gallon Can	6.50
96 Gallon Can	8.35
Extra Bundle	4.15

Other Services

SPU also provides a special collection service for bulky items such as furniture and refrigerators. The rate is $30 per item, with an additional $8 charge for items containing chlorofluorocarbons (CFCs)—like refrigerators. SPU also offers curbside electronics recycling pickup with a $20 charge for each pickup of up to three items.

Low Income Assistance

The city offers rate assistance to qualified low-income customers. Qualified low-income customers receive a 50% discount on their solid waste bill. Customers who live in apartment buildings and do not receive a SPU bill directly receive a fixed credit on their Seattle City Light bill.

Commercial Rates

Seattle has set commercial garbage rates since April 2001, when the City of Seattle entered into contracts with private haulers. At that time, Seattle rolled back some commercial rates to their 1994 levels. Unlike residential customers, businesses can choose to sign up for garbage collection service or self-haul their wastes to the recycling and disposal stations. Table 6-5 shows 2011 rates for some typical commercial service levels.

Table 6-5
SPU Commercial Rates 2011

Service Level per Container Weekly Pick-Up (Uncompacted)	Monthly Rate
1 Yard	178.41
2 Yards	277.57
3 Yards	376.73

Self-Haul Rates

Rates at the recycling and disposal stations vary depending on the kind or type of material (Table 6-6). To help move customers through the stations efficiently, vehicles that typically have small loads (sedans, station wagons, and SUVs) pay a flat rate. All other vehicles are weighed on their way in and out of the stations and charged based on the weight of their load.

Table 6-6
SPU Self-Haul Rates 2011

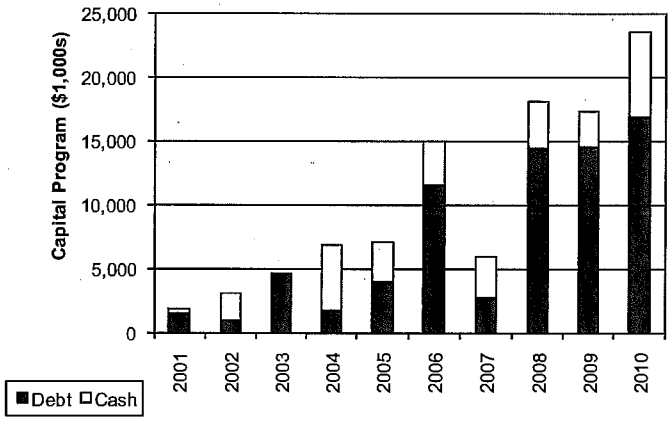
Type of Waste	Flat Rate	Per-Ton
Garbage	30.00	145.00
Yard Waste	20.00	110.00
Appliances	30.00	N/A
Recyclables	No Charge	No Charge

Debt Financing

SPU finances its capital program primarily with debt from the issuance of revenue bonds. A minimum of the greater of $2.5 million[2] or 10% of the capital program is financed with rate revenues or cash.

Before 2008, the solid waste fund's capital program was relatively small. SPU issued bonds in 1999 to fund landfill closure and miscellaneous transfer station improvements, but a large portion of the capital program was financed with rate revenues. From 2003 to 2007, SPU drew on a line of credit to fund land purchases and other capital investments. In 2007 and 2011, bonds were issued to begin funding the transfer station rebuilding project. Figure 6-4 shows capital spending and debt financing from 2001 through 2010. Future capital spending and debt financing are discussed in the following chapter.

Figure 6-4
SPU Capital Spending and Debt Financing 2001-2010



[2] In $2003

6.3.3 PROJECTED MONETARY NEEDS AND FINANCING STRATEGY

The following section highlights the costs of operating SPU's solid waste system and meeting its waste reduction and recycling objectives. First, we discuss the 6-year capital improvement plan and longer-term capital facilities and O&M plan. We then outline likely methods of financing those activities and compare the status quo with SPU's recommended package of programs and policies.

Capital Improvement Program Plan

In 2010, the City Council adopted a Capital Improvement Program (CIP) plan for 2011 to 2016. The CIP is broken down into four major programs as shown in Table 6-7.

Table 6-7
SPU Solid Waste Capital Improvement Plan for 2011 – 2016 (in $1000s)

Program	2011	2012	2013	2014	2015	2016	Total
New Facilities	25,710	35,411	32,368	36,725	21,464	3,975	155,653
Rehabilitation and Heavy Equipment	262	271	58	49	50	51	741
Shared Cost Projects	1,860	2,295	2,098	2,088	2,150	2,318	12,809
Technology	1,415	2,138	4,808	5,512	2,916	2,302	19,091
Total	29,247	40,115	39,332	44,374	26,580	8,646	188,294

New Facilities Program

The New Facilities program includes projects that plan, design, and construct new facilities to enhance solid waste operations. In 2011, SPU continues the implementation of its Solid Waste Facilities Master Plan, which features a two-station configuration. Major projects include rebuilds of the south and north transfer stations, as well as the South Park Development project.

South Transfer Station Rebuild Project

This project replaces the existing solid waste transfer station built in 1966. The design and construction of replacement facilities include several items. Among these are demolition of existing structures, excavation and removal of contaminated soil, and backfill with clean soil. Others are clean-up of the bus yard and re-alignment of a subsurface storm drain pipe to the perimeter of the site. The final items are construction of new recycling and reuse facilities, a household hazardous waste facility, and other utility facilities.

North Transfer Station Rebuild

This project rebuilds the existing North Recycling and Disposal Station built in 1967. The design and construction of the new facility includes demolition of the existing transfer station and a warehouse building. New construction includes an administrative building and employee, recycling and other utility facilities. The two transfer station rebuild projects provide essential structures for solid waste management in Seattle and

enhance our recycling capability. They also provide citizens with sufficient recycling and solid waste services.

South Park Development Project

This project complies with a Washington State Department of Ecology Agreed Order to conduct a Remedial Investigation and Feasibility Study of the historic South Park Landfill site and covers investigation and eventual remediation of the landfill site to protect human health and the environment. SPU owns a portion of the site on which the landfill once operated, and was an historic operator of the landfill at one time. Final cost allocation among potentially liable parties will occur at a later stage.

Rehabilitation and Heavy Equipment Program

The Rehabilitation and Heavy Equipment program designs and constructs projects to repair and upgrade solid waste facilities.

Shared Cost Projects Program

The Shared Cost Projects program includes capital costs that typically benefit multiple lines of business (for example, the Water and the Drainage and Wastewater lines of business). The costs are "shared," or paid for, by more than one of SPU's utility funds.

Technology Program

The Technology program makes use of recent technology advances to increase efficiency and productivity. It replaces vital systems that will no longer be supported beyond 2011. The program includes a planned upgrade to the Consolidated Customer Service System and new technology solutions for enhanced customer contact management.

Long-Term Capital Facilities Budget

In addition to the 6-year CIP, SPU has developed its best estimate of a capital facilities budget through 2030, given what is known and anticipated at this time (Table 6-8). The long-term capital budget is expected to be the same for the status quo and the recommended package of programs.

Table 6-8
SPU Solid Waste Capital Facilities Plan through 2030 (in $1000s)

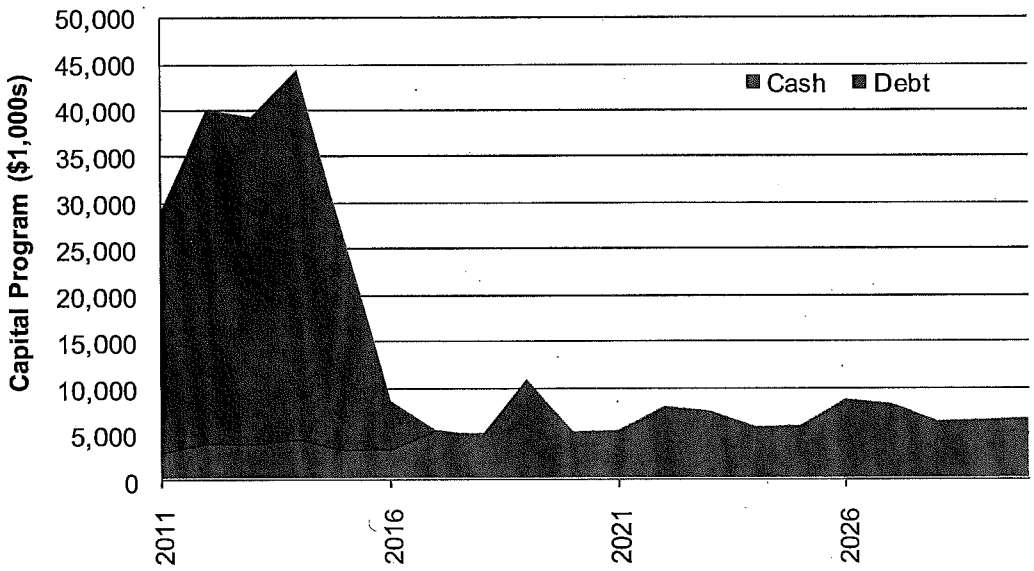
Business Area	2017-2020	2021-2025	2026-2030
New Facilities	492	5,252	5,825
Rehabilitation and Heavy Equipment	5,749	118	
Shared Cost Projects	8,206	11,439	12,942
Technology	11,798	15,476	17,509
Total	26,246	32,285	36,276

Once the north and south transfer station replacement projects are complete, the solid waste CIP is expected to drop to about $5 million annually. This amount includes regular equipment replacement, intermittent station improvements and ongoing shared and technology projects.

Projected Capital Financing

SPU plans to finance most of the CIP with debt during the period of significant capital spending associated with rebuilding the transfer stations (Figure 6-5). After that time, SPU expects to finance all of its CIP with cash.

Figure 6-5
SPU Projected Capital Financing (in $1000s)



O&M Outlook

The solid waste fund's 2011 adopted O&M budget by branch and functional area is in Table 6-9. Contracted collection processing, and disposal costs make up about 60% of solid waste system costs. Other significant costs include city and state taxes (11%) and transfer station operations (5%).

Table 6-9
SPU Adopted O&M Budget by Branch and by Function 2011

	SPU Branch								Accounting Organization		
Major Cost Centers	Customer Service	Field Operations	Utility Systems Mgmt	Finance & Admin	HR & Service Equity	Director's Office	Project Delivery[1]	Pre-Capital Planning & Develop.	General & Admin Credit	General Expense	**Total**
Collect, Process, Disposal Contracts										$93,216,952	$93,216,952
LHWMP[2] payment										$2,874,072	$2,874,072
Phones and billing	$3,684,157										$3,684,157
Recycling & waste reduction programs, inspections	$3,188,747										$3,188,747
Transfer station ops		$8,275,51									$8,275,515
Landfill Maintenance		$ 86,172									$ 986,172
Solid Waste Planning & Contract Management			2,333,937								$ 2,333,937
Rates, budget, accounting, contracts, IT, fleets, facilities				$3,129,260							$3,129,260
Personnel, safety, service equity					$1,601,295						$1,601,295
Economists, communications, community relations, legislative liaison, dept leadership						$1,740,916					$1,740,916
Non-project general[3]	$2,036,692	$808,344	$412,423				$463,425	$463,700		$77,025	$4,261,609
Allocated city costs										$4,310,328	$4,310,328
Taxes										$18,123,440	$18,123,440

	SPU Branch								Accounting Organization		
Major Cost Centers	Customer Service	Field Operations	Utility Systems Mgmt	Finance & Admin	HR & Service Equity	Director's Office	Project Delivery[1]	Pre-Capital Planning & Develop.	General & Admin Credit	General Expense	**Total**
Debt Service										$7,338,581	$7,338,581
G&A Credit									$(1,531,563)		$(1,531,563)
Solid Waste Tax funded via General Fund											
Clean City Programs	$3,668,419		$92,273								$3,760,692
Reimbursements = Expenditures											
LHWMP	$ 293,083	$1,640,985	$331,541		$223,498						$ 2,489,107
Total	$ 12,871,098	$11,711,016	$3,170,174	$3,129,260	$1,824,793	$1,740,916	$ 463,425	$463,700	$(1,531,563)	$125,940,398	$159,783,217

[1]Capital Projects. Moved to capital when projects moved forward. Various branches

[2] Local Hazardous Waste Management Program

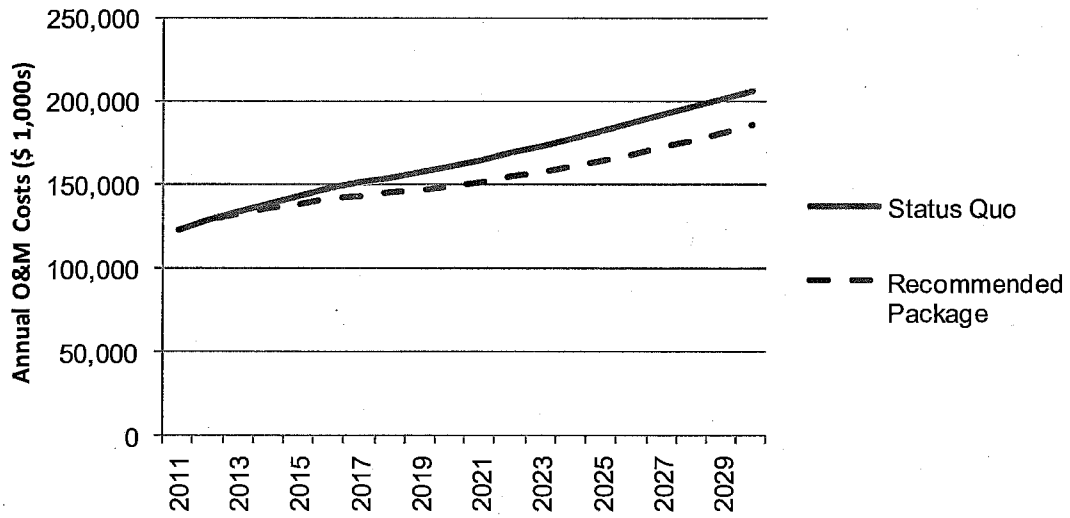
[3]Share of general solid waste fund activities or those benefitting all three funds

Under the status quo, solid waste system O&M expenses[3] through 2030 are expected to grow mainly due to inflation. Contract terms include escalators based on inflation indices. SPU labor costs will follow cost of living trends. The proportion of costs in each branch and function is expected to remain about the same.

Projected O&M costs are lower under the recommended package of programs than under the status quo. Variable collection, processing, and disposal costs for each recycled ton are generally lower for recycled tons than for disposed tons. Since the recommended package has more recycled tons than the status quo, variable costs are lower. Also, while SPU recycling program implementation costs are higher in the recommended package, the increase is more than offset by the savings on the variable contract costs.

Figure 6-6 compares O&M projections for the status quo and recommended package.

Figure 6-6
Projected SPU Solid Waste O&M Spending

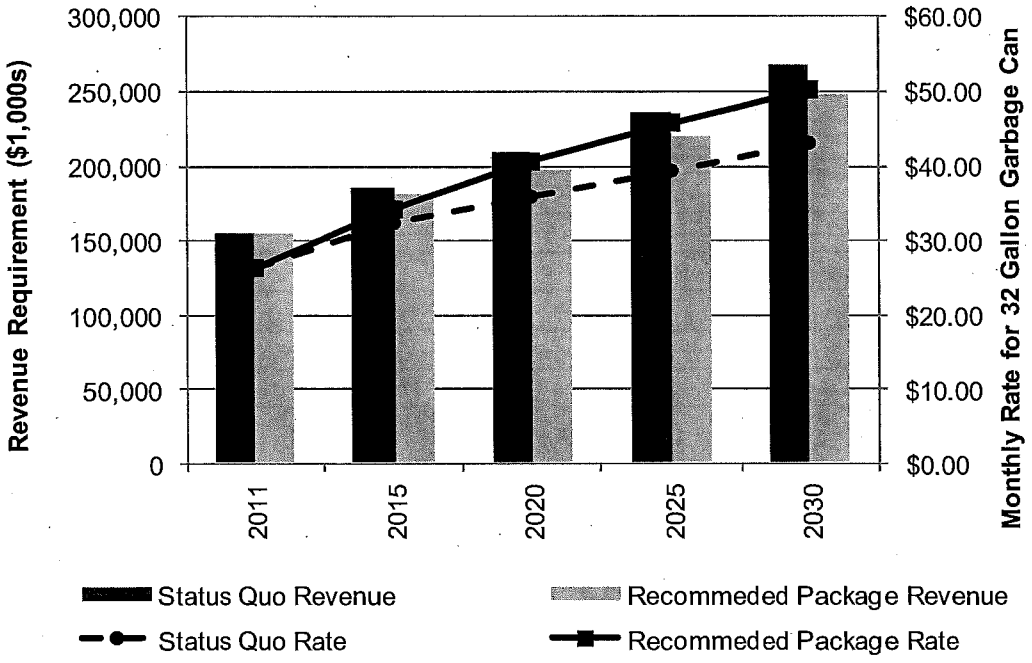


Revenue and Rate Projections

Rate increases are required under the status quo and recommended scenarios to meet the financial policies discussed in section 6.3.1 (Figure 6-7). Revenues are higher under the status quo than under the recommended scenario. They rise from about $150 million in 2011 to about $260 million by 2030. Costs are lower under the recommended scenario (see O&M Outlook section) than under the status quo, resulting in a lower revenue requirement.

[3] Operations and Maintenance (O&M) not including debt service or taxes

Figure 6-7
Status Quo and Preferred Scenarios

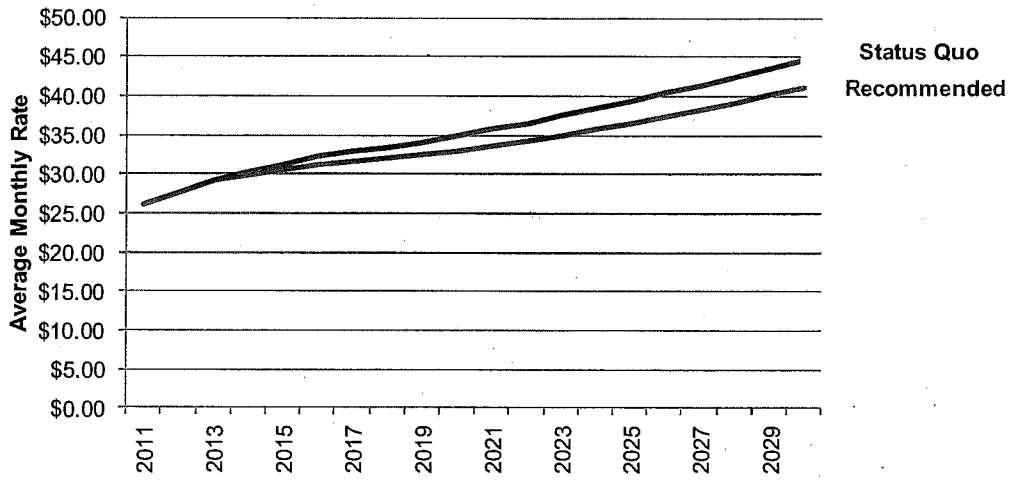


Rates need to raise more in the recommended package than in the status quo scenario. This difference can be attributed to the impact on customer subscription levels of waste reduction and recycling. As customers decrease their amount of garbage, they will reduce the size, number or frequency of containers they need. In turn, this reduces the number of service units from which SPU can collect rates. Therefore, the rate per unit rises.

On the other hand, SPU offers many subscription level options. Many customers who reduce their volume of garbage will also decrease their garbage can size. Therefore, those customers' actual bills will not go up by as much as Figure 6-7 suggests. It shows the increase for the same subscription level (can size) over time.

The garbage rate for the average customer reflects changes in customer can sizes. The average rate for the recommended scenario actually increases more slowly than for the status quo (Figure 6-8). The reason for the slower increase is that customers tend to switch to a smaller can size as they reduce waste and recycle more.

Figure 6-8
Average Rates for Status Quo and Preferred Scenarios*

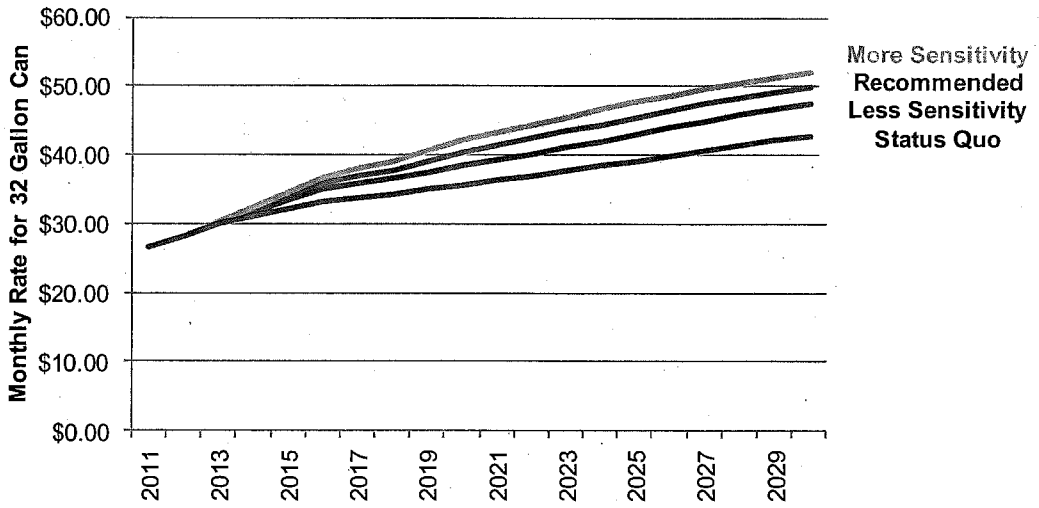


*Assumptions are based on historical customer demand patterns

Alternative Rate Projections

Rates will be sensitive to actual customer demand (Figure 6-9). If customers decrease their subscription levels less than projected, then rates will not increase as much as Figure 6-8 suggests. Alternatively, if customers decrease their subscription levels more than projected, then rates will increase more than projected.

Figure 6-9
Status Quo and Preferred Scenarios Revenue and Rate Projections



Other Rate Drivers

Other rate drivers are operational efficiencies, recovery fees, and product stewardship.

Operational Efficiencies

SPU has made strides in identifying operating efficiencies and reducing costs to cope with the impact of the recent recession. In the future, additional operating efficiencies can help offset rate increases. For example, SPU's new transfer stations will have more capacity and therefore reduce reliance on private transfer stations. In addition, we can reallocate existing staff resources to some of the new recycling and waste reduction programs.

Recovery Fees

Consumer or producer recovery fees, paid when a product is produced or sold, could be a source of funding for solid waste. These fees would help pay for some solid waste system costs, thereby reducing the amount that needs to be recovered from ratepayers. See Chapter 3 Waste Prevention, section 3.2.4, for details on how consumer or producer fees could be used to recover costs associated with disposing or recycling certain products and their packaging.

Cost Internalization and Other Product Stewardship Initiatives

Initiatives that encourage consumers to choose products with fewer environmental effects, or programs that remove materials from the solid waste stream (producer take-back initiatives), will also lower SPU's costs and mitigate rate increases.

Conclusion

Rates will rise whether SPU stays with the status quo or proceeds with this plan's recommendations. Under the status quo, rates will rise to cover inflation and any new capital investments.

The recommended programs reduce garbage tons moving through the system. The new programs also have implementation costs. However, cost savings from less garbage more than offset new program costs, thus reducing the overall revenue requirement. The effect on rates is that they need to increase more than under the status quo. They need to rise more to make up for revenue losses as customers reduce their service levels (lost subscription units) in response to the new programs.

Appendix A
Glossary

Appendix A: Glossary

Anaerobic Digestion	The process by which organic material is broken down by micro-organisms in the absence of oxygen. This process results in emission of a CO2- and methane rich biogas that can be collected and used as an energy source. The digestate can then be landfilled or composted.
Beyond Waste	The ultimate message behind the State of Washington Solid Waste Management Plan. Beyond Waste focuses on achieving a state where waste is viewed as inefficient and toxic substances have been eliminated.
Biosolids	Municipal sewage sludge that is a primarily organic, semisolid product resulting from the wastewater treatment process and can be beneficially recycled.
Built Green®	A market-driven green building program usually administered by local homebuilders association chapters. The focus of this program is to promote and certify green construction in the residential sector.
Byproduct synergy	The principle underlying by-product synergy is that one industry's waste can be another's primary resource.
Commercial Solid Waste	All types of solid waste generated by stores, offices, restaurants, warehouses and other non-manufacturing activities, excluding residential and industrial wastes.
Commingled Recycling	A method of recovery and/or collection where recyclable commodities are mixed together and sorted at a material recovery facility (MRF).
Compact fluorescent lamps (CFLs)	A type of fluorescent lamp typically designed to replace an incandescent lamp. Like all fluorescent lamps, CFLs contain mercury, which complicates their disposal.
Composting	The biological degradation and transformation of organic solid waste under controlled conditions designed to promote aerobic decomposition.
Conditionally Exempt Small Quantity Generator (CESQG)	A dangerous waste generator whose dangerous wastes are not subject to regulation under Chapter 70.105 RCW, Hazardous Waste Management, solely because the waste is generated or accumulated in quantities below the threshold for regulation and meets the conditions prescribed in WAC 173-303-070 (8)(b).
Construction and Demolition Debris (C&D)	(Construction, Demolition and Land-clearing Debris (CDL)) The waste material that results from construction, demolition and land clearing, largely comprised of inert and organic material. Consists of, but is not limited to the following materials: wood waste, concrete, asphalt, gypsum wallboard, glass and scrap metal.
Contamination	Garbage in recyclable materials.

Dangerous Waste	Discarded, useless, unwanted or abandoned substances, including but not limited to certain pesticides, or any residues or containers of such substances which are disposed of in such quantity or concentration as to pose a substantial present or potential hazard to human health, wildlife or the environment because such wastes or constituents or combinations of such wastes: a) have short-lives, toxic properties that may cause death, injury or illness or have mutagenic, teratogenic or carcinogenic properties, or: b) are corrosive, explosive, flammable or may generate pressure through decomposition or other means.
Discards	Items or materials cast aside because they are no longer wanted or needed.
Designated Recyclables	Wastes separated for recycling or reuse, such as paper, metals and plastics that are identified as recyclable material pursuant to a local comprehensive solid waste plan.
Diversion	Materials that are taken out of the waste stream. Any method of recycling, energy production or beneficial use that prevents disposition of material in landfills or incinerators.
E-Cycle Washington	Washington's producer-funded recycling program for computers, monitors, laptops and televisions.
E-Waste	(Electronic Waste): Waste products produced as a result of spent, unusable or unwanted electronics. Examples include computer monitors, televisions, and desktop or laptop computers.
Environmental Justice	The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.
Flow Control	A local or state government having the authority to direct municipal solid waste (MSW) to certain facilities.
Green Building	Reducing the physiological and environmental effects caused by the construction, operation, maintenance and demolition of buildings.
Green Purchasing	Also known as environmentally preferable purchasing (EPP) or responsible purchasing. The procurement of products or services that cause less harm to human health and the environment when compared with competing products or services that serve the same purpose.
Household Hazardous Waste (HHW)	Any waste that exhibits the properties of dangerous wastes, but is exempt from dangerous waste regulations solely because households generate it. Those substances identified by the Washington State Department of Ecology as hazardous household substances in the guidelines developed under RCW 70.105.220 (LHWMP Guidelines).
Intermodal Facility	Any facility operated for the purpose of transporting closed containers of waste and the containers are not opened for further treatment, processing or consolidation of the waste.
Landfill	A disposal facility or part of a facility at which solid waste is permanently placed in or on land including facilities that use solid waste as a component of fill.

LEED	Leadership in Energy and Environmental Design. A green building rating and certification system developed by the United States Green Building Council.
Local Hazardous Waste Management Plan (LHWMP)	A county's plan to meet the law pursuant to RCW 70.105.220.
Washington Materials Management and Financing Authority (MMFA or WMMFA)	The manufacturer authority created by state law to handle the recycling of certain electronics in the state of Washington.
Material Recovery Facility (MRF)	Any facility that collects, compacts, repackages, sorts or processes for transport source separated solid waste for recycling.
Moderate Risk Waste (MRW)	Solid waste that is limited to conditionally exempt small quantity generator (CESQG) waste and household hazardous waste (HHW) as defined in Chapter WAC 173-350.
Municipal Solid Waste (MSW)	A subset of solid waste that includes unsegregated garbage, refuse and similar solid waste material discarded from residential, commercial, institutional and industrial sources and community activities, including residue after recyclables have been separated.
Organics (organic materials	Organic materials that include landscaping and yard waste, food waste, manures, crop residues, wood, soiled/low-grade paper, and biosolids.
Product Stewardship	Product stewardship is achieved when those who produce, sell, use, or dispose of a product assume responsibility for the product's environmental, social, and economic costs throughout the product's life cycle.
Recycling	Transforming or remanufacturing waste materials into usable or marketable materials for use other than landfill disposal or incineration.
Solid Waste	All putrescible and nonputrescible solid and semisolid wastes including, but not limited to garbage, rubbish, ashes, industrial wastes, swill, sewage sludge, demolition and construction wastes, abandoned vehicles or parts thereof, contaminated soils and contaminated dredged material, and recyclable materials.
Solid Waste Advisory Committee (SWAC)	An advisory committee established at the local level within each planning jurisdiction and at the state level. Assists in development of programs and policies concerning solid waste handling and disposal and to review and comment on proposed rules, policies, or ordinances prior to their adoption.
Source Separation	The separation of different kinds of solid waste at the place where the waste originates.
State Environmental Policy Act (SEPA)	A way to identify possible environmental impacts that may result from governmental decisions.
Sustainability	Meeting the needs of the present without compromising the ability of future generations to meet their own needs.

Transfer Station	A permanent, fixed, supplemental collection and transportation facility used by persons and route collection vehicles to deposit collected solid waste from offsite into a larger transfer vehicle for transport to a solid waste handling facility.
Waste Characterization	The composition and ratio of materials in the total waste stream. Also sometimes referred to as a "waste audit."
Waste Prevention	Also sometimes referred to as waste reduction or "precycling." The practice of minimizing waste through responsible purchasing and consumerism. Essentially, removing waste from the waste stream by not creating it in the first place.
Wood Waste	Solid waste consisting of wood pieces or particles generated as a byproduct of waste from the manufacturing of wood products, construction, demolition, handling and storage of raw materials, trees and stumps. Includes, but not limited to sawdust, chips, shavings, bark, pulp, hogged fuel and log sort yard waste. Does not include wood pieces or particles containing paint, laminates, bonding agents or chemical preservatives such as creosote, pentachlorophenol or copper-chrome-arsenate.
Yard Waste/Debris	Plant material commonly created I the course of maintain yards and gardens and through horticulture, gardening, landscaping or similar activities. Includes, but not limited to, grass clippings, leaves, branches, brush, weeks, flowers, roots, windfall fruit and vegetable garden debris.

Appendix B
Zero Waste Resolution 30990

Appendix B: *Zero Waste Resolution* (30990)

Resolution Number: 30990

A RESOLUTION establishing new recycling goals for the City of Seattle and providing direction on waste-reduction programs and solid waste facilities.

Status: Adopted
Date adopted by Full Council: July 16, 2007
Note: *Zero Waste Strategy*

Vote: 9-0

Date introduced/referred to committee: June 25, 2007
Committee: Environment, Emergency Management and Utilities
Sponsor: CONLIN

Index Terms: STATING-POLICY, RECYCLING, SOLID-WASTE-DISPOSAL, LANDFILLS, TRANSFER-STATIONS, SOLID-WASTE, WASTE-DISPOSAL

Fiscal Note: Fiscal Note to Resolution 30990

Electronic Copy: PDF scan of Resolution No. 30990

Text

Note to users: {- indicates start of text that has been amended out
-} indicates end of text that has been amended out
{+ indicates start of text that has been amended in
+} indicates end of text that has been amended in

RESOLUTION _____

A RESOLUTION establishing new recycling goals for the City of Seattle and providing direction on waste-reduction programs and solid waste facilities.

WHEREAS, Resolution 27871 adopted the City of Seattle's ("City's") 1988 Integrated Solid Waste Management Plan which established a goal of recycling 60% of the waste produced within the city; and

WHEREAS, the City's 1998 and 2004 Solid Waste Plans, adopted by Resolutions 29805 and 30750, respectively, reaffirmed the 60% recycling goal; and

WHEREAS, the substantial recycling progress to date has been slower than expected causing the timeframe for reaching the 60% recycling goal to be incrementally lengthened from 1998 to 2010; and

WHEREAS, the City Council and Mayor seek to further reduce disposed waste so that the City can more quickly meet and exceed its 60% recycling goal and build more efficient waste facilities; and

WHEREAS, to address future recycling and waste disposal needs, the City Council and Mayor adopted Resolution 30431 directing Seattle Public Utilities ("SPU") to prepare a Solid Waste Facilities Master Plan ("Master Plan"); and

WHEREAS, the Master Plan, completed in 2004, recommended rebuilding the City's two transfer stations and constructing a new intermodal facility in south Seattle; and

WHEREAS, to further validate the City's waste-reduction and facility approaches, the City Council and Mayor requested that an independent consultant conduct a review of SPU's recycling efforts and facilities proposals. That review resulted in the April 2007 Seattle Solid Waste Recycling, Waste Reduction, and Facilities Opportunities report ("Zero-Waste Report"), which identified new recycling actions and facility efficiencies through which the City might reach 72% recycling by 2025; and

WHEREAS, the City Council and Mayor seek to expand recycling and move forward with facility upgrades by applying zero-waste principles to the City's management of solid waste; NOW, THEREFORE,

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF SEATTLE, THE MAYOR CONCURRING, THAT:

Section 1. Goals. The City establishes the following goals for recycling and waste reduction.

A. The City will recycle 60% of the waste produced within the city by 2012, and 70% of the waste produced within the city by 2025.

B. The City will not dispose of any more total solid waste in future years than went to the landfill in 2006 (438,000 tons of municipal solid waste ("MSW".

C. For the next five years, the City will reduce the amount of solid waste disposed by at least 1% per year (2008-2012).

D. Future waste-reduction goals for the period 2013-2028 (the term of the long-haul disposal contract) will be set based on the experience of the first five years, with the aspiration of achieving a steady reduction in the amount of waste disposed each year.

Section 2. Waste-Reduction Strategies. The action strategies adopted to achieve City goals shall apply zero-waste principles. Zero-waste principles entail managing resources instead of waste; conserving natural resources through waste prevention and recycling; turning discarded resources into jobs and new products instead of trash; promoting products and materials that are durable and recyclable; and discouraging products and materials that can only become trash after their use. Action strategies should include elements that:

A. Actively encourage and support a system where producers minimize waste during product design and take responsibility for the reuse or recycling of used products;

B. Promote the highest and best use of recycled materials;

C. Minimize the environmental impacts of disposed waste; and

D. Implement actions in a sequence that: 1) starts by simultaneously offering any new recycling service for customers to use on a voluntary basis, implementing incentives to encourage participation, and pursuing product stewardship approaches to avoid waste or remove waste from the City waste stream and 2) as a second step consider prohibiting disposal of the targeted materials as garbage in order to ensure full participation of all customers.

Section 3. Waste-Reduction Actions. SPU shall propose specific waste-reduction actions, consistent with the strategies described above, to achieve City recycling goals as part of future rate proposals, budgets, and solid waste plan updates. The proposed rates and budgets for 2008, 2009, and 2010 shall include, at minimum, the actions in Attachment A. Additional actions (similar to those in the Zero-Waste Report) shall be proposed as part of future rates, budgets, and solid waste plans as needed to meet City goals.

Section 4. Facility Actions. To help reach City waste-reduction goals and efficiently manage current and future solid waste, the following actions shall be taken to upgrade City facilities.

A. The South and North Recycling and Disposal Stations ("SRDS" and "NRDS") will be designed to accommodate expanded recycling, a retail re-use facility, and self-haul waste and collection trucks in roughly the same proportions that they now experience, but with design elements for self-haul tonnages to be below current levels. While there may continue to be, on an operational basis, some use of private transfer stations, NRDS and SRDS will be designed to handle the City's MSW.

B. To the extent that the recycling and disposal stations experience decreases in total tonnages of waste disposed, the City will explore the possibility of adding additional waste-reduction and recycling programs, and the stations will be designed to facilitate conversion of space dedicated to disposal to waste reduction and recycling.

C. The City will purchase additional properties for the development of the new SRDS.

Section 5. Reporting. SPU will report to Council by July 1 of each year on the previous year's progress toward recycling goals, as well as further steps to be taken to meet goals in the current and upcoming years. Each annual report shall contain the comments of the Solid Waste Advisory Committee.

Adopted by the City Council the ____ day of _____, 2007, and signed by me in open session in authentication of its adoption this

_____ day of _____, 2007.

_____

President _____of the City Council

THE MAYOR CONCURRING:

_____

Gregory J. Nickels, Mayor

Filed by me this ____ day of _____, 2007.

_____

City Clerk

(Seal)

Attachment A: Waste-Reduction Actions

Meg Moorehead/mm

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July 3, 2007

Version #4a

ATTACHMENT A: WASTE-REDUCTION ACTIONS

TO RESOLUTION 30990 ESTABLISHING NEW RECYCLING GOALS FOR THE CITY OF SEATTLE AND PROVIDING DIRECTION ON

WASTE-REDUCTION PROGRAMS AND SOLID WASTE FACILITIES

The following actions shall be implemented to achieve waste-reduction goals. The first years of implementation are shown in parentheses.

ALL WASTE

A. All City agencies will meet or exceed all requirements for waste reduction and recycling placed on commercial and residential customers (2007).

B. The City will institute a $100,000 annual Waste Reduction/Recycling Matching Fund for community recycling/waste reduction initiatives (2008).

C. SPU will initiate a market development effort for difficult to recycle materials such as asphalt roofing, drywall, and tires (2008).

D. The City's Solid Waste Advisory Committee (SWAC) will be consulted on design and implementation strategies for new programs, and the City shall consult with other appropriate stakeholders as needed to provide input into the analysis of actions for implementation in 2008

or beyond. Additional members may be added to the SWAC or ad hoc advisory groups may be formed to perform more detailed work on specific action strategies if this would be helpful in meeting the increased work load for the SWAC (2008 and beyond).

E. Seattle Public Utilities (SPU) will expand inspection and enforcement actions for the present ban on disposal of recyclables (2009-2011).

F. SPU will mandate that all collection trucks use a ultra-low sulfur diesel/biodiesel mixture or compressed natural gas to reduce both airborne particulates and green house gas emissions (2009).

G. SPU will institute performance-based contracting for collection/disposal companies through 2009 collection contracts based on achieving waste-reduction goals (instead of amount of waste disposed) (2009).

H. SPU will increase opportunities for waste reduction audits and waste reduction/recycling education to commercial customers (2009).

I. SPU will increase opportunities for waste reduction audits and waste reduction/recycling education to residential and multi-family customers. (2009).

J. The City will expand recycling services available at large events and parks (2010).

K. The City will explore ways to cooperate with other governments in Central Puget Sound to coordinate waste reduction, product stewardship, and other efforts across jurisdictions (2008).

ORGANICS

A. The City will continue to build a commercial organics program through 2007 and beyond by working with customers and collection companies to provide incentives and design programs to facilitate, promote, and increase the cost-effectiveness of commercial organics collections. Among the incentives to be evaluated will be designing rates to encourage organics recycling, including decreasing the per-unit organics charge as quantities of organics increase (2007).

B. The City will further develop its residential organics program in negotiations and contract discussions in fall 2007 (2007).

C. The City will implement a new organics program on April 1, 2009, including:

* All single-family customers will have organics collection unless the customer is actively composting food in the yard (an exemption process will be developed).

* A tiered can rate will be established for organics.

* All food waste will be included in organics collections.

* A future ban of all organics from single family garbage will be

considered once the collection system has been fully established (2009).

D. Multi-family organics collection will be expanded to be a voluntary service available to all customers no later than April, 2009. SPU will review and propose incentives and education programs that will encourage participation by property owners and residents (2009).

E. Collection frequencies for garbage, recycling and organics will be determined in fall 2007 as part of negotiations with service providers. The evaluation criteria for different collection alternatives (and costs, benefits and operational impacts associated with collection frequencies) will be determined in time for implementation in the 2009 collection contract. If weekly organics and every other week garbage are not part of the baseline 2009 collection contract, then pilots on these frequencies will be performed in 2010-2011 (2009-2011).

F. SPU will conduct a study by the end of 2010, to be done with an advisory group, to determine the costs, benefits, operational impacts and effectiveness of a potential mandatory multi-family organics collection program which could be implemented by the end of 2011. The scope of work for the study will include a requirement to develop evaluation criteria (2010-2011).

SELF HAUL

A. Both North and South Recycling and Disposal Stations will continue to be available for self-haul customers (2007 and beyond).

B. Newly constructed facilities will be designed to address present overcrowding. However, facility designs will assume a total self-haul disposal tonnage below current levels, due to anticipated diversion programs (2007 and beyond).

C. To help reduce tonnages, starting in 2008, self haul will be priced at full operating cost. As North and South stations are reconstructed, self-haul charges will ramp up to reflect at least partial capital costs as well (2008).

D. SPU will promote contracted and private sector pickup and diversion services to self-haul customers, to increase station efficiency (2008).

E. In 2008, SPU will conduct a study to evaluate potential waste-reduction incentives and disincentives targeted to self-haul customers. This study will include options such as on-demand or periodic curbside pick-up, providing periodic vouchers for private pickup service, and increasing public awareness of private pickup options to minimize self-haul customer traffic at City transfer stations. In 2009, the Executive will work with Council to determine next steps on minimizing self haul including pilot programs where appropriate (2008-2009).

CONSTRUCTION AND DEMOLITION (C&D) WASTE

A. The City will increase reuse/waste reduction/recycling of C&D waste through the modification of the City's current demolition permit by the end of 2008. The permit modifications will emphasize and give priority to steps that would lead to the salvage and reuse of building materials. SPU will work with the Department of Planning and Development (DPD) to develop the permit modifications and to explore incentives and disincentives to developers and contractors to accomplish waste-reduction goals. Permit development will identify the minimum project size (in square feet) for which a demolition permit will be required (2008).

B. By mid-2008, the City will explore incentives such as grants, tax reductions, and development assistance to encourage private companies to develop facilities for sorting and recycling C&D waste (2008).

C. By mid-2008, SPU will analyze potential waste reduction/recycling opportunities available to the City for C&D waste through development of a publicly owned C&D facility and use of the City's flow control authority (2008).

D. The Mayor and Council will make a decision by mid-2008 on whether to issue a potential Request for Proposals (RFP) for either private or public C&D processing plant (s), based on the analyses detailed above (2008).

E. The City will consider providing incentives and requirements for larger development projects to promote recycling of C&D waste and use of recycled materials in construction, and/or adopting a City requirement that a given percent of C&D waste from each construction site be reused or recycled. This could include requiring a recycling plan and fee deposit when issuing building and demolition permits, with a portion of the fee refunded based on the amount of C&D waste recycled (2010).

F. The City will also consider grants, tax reductions, and other incentives to encourage businesses to reuse C&D materials (such as roofing and drywall) or reprocess them into new products (2010).

G. The City will review benefits, costs, operational impacts, and possible implementation time frames in recommending whether to pursue a prohibition on disposal of C&D recyclables as garbage at City stations (2010).

H. The City will review benefits, costs, operational impacts, and possible implementation time frames for increasing tipping fees for disposal of mixed C&D waste while decreasing the fee for transfer station drop-off of source-separated recyclable C&D materials (2010).

PRODUCT STEWARDSHIP

A. SPU will increase support for the Northwest Product Stewardship Council (NPSC) (2008).

B. SPU will contract with the NPSC to conduct a study to determine the most effective strategies for local stewardship activities (2008).

C. The Mayor and Council will identify and consider potential state legislation regarding product stewardship for the 2008 state legislative session (2008).

D. SPU will evaluate the feasibility of implementing producer take-back programs and recommend appropriate action steps for Styrofoam packaging take-back, manufacturer/retailer take-back of used carpet and possible tax incentives or other business development incentives to promote local carpet-recovery markets, producer take-back and reprocessing for paint, and improvements to regional mercury-containing product recycling/take-back for mercury-containing products such as fluorescent light bulbs and thermometers (2008).

E. SPU will actively participate in implementation planning for e-waste producer-funded take-back programs and endeavor to ensure that implementation in Seattle captures the maximum feasible amount of e-waste (2008).

PRODUCT BANS

By mid-2008 SPU will conduct a comprehensive study of products, packages and ingredients that could be banned or otherwise discouraged through taxes or other means. This study will include:

* Identification of potential products, packages and/or ingredients that could be banned or discouraged in the near future.

* Legal alternatives for banning, restricting, or discouraging the use of products, packages, and/or ingredients.

* Criteria for evaluating such actions, including the actions' costs and benefits, including water quality benefits to the Puget Sound basin.

* An evaluation of available substitutes for anything for which actions are proposed.

* Recommendations for an implementation/action plan based on a prioritized list (2008).

Initial products for review will include non-compostable plastic shopping bags and Styrofoam food containers, for which SPU will complete its study and recommendations by the earlier deadline of December 2007.

ACTIONS TO BE INCLUDED IN THE 2008 RATE.

The following actions will be among those incorporated into the 2008 rate:

* Self-haul study and promotion of private curbside service providers;

* Product stewardship study/services from NPSC;

* Study on potential bans of certain materials;

* Rate study that evaluates rate designs for organics including variable can rates and tiered commercial rates;

* C&D: Develop DPD program, Industrial Revenue bonds for C&D processing feasibility, and draft RFP;

* Community waste-reduction matching grants; and

* Market development for problem materials.

Attachment A v.4b

Appendix C
Public Involvement

SUMMARY OF RESPONSES

To Feedback on the Preview Draft
Of the
2011 Seattle Solid Waste Plan Revision

This summary lists the notable changes made to *Seattle's 2011 Solid Waste Plan* revision in response to public review. The first draft of the Plan, the August 1, 2011 *Preview Draft*, received extensive public review, as documented in the *Summary of Stakeholder Outreach Feedback* available at Seattle Public Utilities' Plan website. The feedback process is further documented in *Appendix C's Public Involvement Plan* to the *March 2012 Preliminary Draft* of the Solid Waste Plan. Most of the feedback comments addressed municipal solid waste (MSW) recommendations.

Comments on construction and demolition debris (C&D) recommendations were garnered through a parallel process, and documented in the *2011 Stakeholder Outreach and Responsiveness Summary: Proposed Construction and Demolition Recommendations in Seattle's Comprehensive Solid Waste Management Plan,* also available at the Plan website.

Comments came from meetings with community groups and other stakeholder groups, letters and other comments emailed to the dedicated Plan email account, a transfer station customer survey, and an on-line survey. The on-line survey turned out to be the response method of choice, yielding the most responses: 593 persons took the survey, with 256 of those submitting 597 comments. Since the public review process amassed more than 600 comments, SPU determined the most practical way to present feedback was to summarize and group them according to the section of the Plan, by respondent groupings, in the documents discussed above. Copies of original comments are available by contacting the Plan's project manager at spu_solidwasteplan@seattle.gov.

Seattle Public Utilities and the Seattle Solid Waste Advisory Committee reviewed all comments and took them under advisement for the next draft of the Plan, the *Preliminary Draft*. Below are brief descriptions of the notable changes that resulted from the feedback review process, as well as notable editorial improvements. They are organized by Plan chapters and sections, with highlighting on changes to the Plan's recommendations.

Chapter - Section

Executive Summary

- Text and charts updated to reflect changes in chapters.
- **Executive Summary - Recommendations Summary**: matrix updated to reflect recommendations changes in chapters

Chapter 1 Revising Seattle's Solid Waste Plan

1.2 and 1.3 Planning History: Added additional Seattle solid waste planning history; corrected 1st text box to show last bullet previously hidden

1.3.1 Regulatory and Policy Framework: Added reference to City of Seattle Department of Planning and Development to section

1.3.3 Keeping the Plan Up to Date: Added more details about Seattle's process for keeping Seattle's Plan current

Chapter 3 Waste Prevention

Some content restructuring for better flow

3.2 Planning Issues

3.2.4 Product stewardship: clarified cost internalization and fee discussion

3.3 Current Programs and Practices

3.3.3 Residential Backyard Food and Yard Waste Composting: Clarified Local Hazardous Waste Management Program role in funding on-site yard waste programs

3.3.4 NWPSC: Corrected description of Northwest Product Stewardship Council (NWPSC) and its members' roles in state legislation. Corrected references to E-Cycle Washington electronics recycling prgram

3.3.4 Additional Product Studies: Table 3-4 Clarified source of tonnage estimates. Removed MTBE from product list

3.4 Alternatives and Recommendations

3.4.1 Electronic Products Reuse, Expansion of Covered Products: Added recommendations for keeping up electronics disposal standards

3.4.3 Residential Backyard Food and Yard Waste Composting: Added to reasoning for grasscycling recommendation – healthy lawns better storm water retention, reduced irrigation, reducing seasonal overloading of grass clippings (and potential odor problems) at compost facility

3.4.4 Product Stewardship: Restructured recommendations to better layout goals versus recommendations. Added recommendation to support future programs based at least in part on recovery rates compared to existing programs. Added recommendation to emphasize job creation potential.

3.5 Measurement

3.5.2 Industrial Materials Reuse: Added reference to IMEX as potential data source

3.5.6 Measurement: Added monitoring city-wise overall waste generation to waste prevention measurement strategies

Chapter 4 Seattle's MSW System: Managing Discards

4.2 Collection

4.2.5 Table 4-3 Collection Customer Satisfaction: Updated to reflect more recent (2011) survey results

4.2.4 Collection Recycling Recommendations:

- Added recommendation to increase awareness of other (than regular curbside) existing collection services

- Added recommendation to increase education and outreach to reduce contamination
- Changed recommendation about single-family every other week garbage collection to consider for the future (versus previous recommendation to implement in 2015 in section 4.3.4)

4.3 Recycling

4.3.4 Table 4-11 Status Quo Recycling Rate Projections: 2010 data updated to actual

4.3.4 Table 4-13 Recommended Recycling Programs Implementation Schedule: Removed recommendation to implement single-family every other week garbage (EOW) collection in 2015, changed to consider EOW in the future and moved to section 4.2.4. More clearly flagged programs already underway.

4.3.4 Table 4-14 Recommended Programs Recycling Rate Projections: Updated to reflect revised projections of recycling results from changes to recommendations

4.3.4 Figure 4-9 Recycling Rate Status Quo versus Recommended: Updated to reflect revised projections of recycling results from changes to recommendations

4.5 Processing and Disposal

4.5.2 Planning Issues: Added new section Solid Waste Facility Siting to present State of Washington RCW 70.95.165 siting criteria and applicability to Seattle solid waste facility planning

4.5.3 Recycling Processing: Clarified current contracting provisions for opt-out and end dates.

4.5.3 Designation of Recyclable Materials: Added details on criteria for material selection. Added requirement to report changes to Washington Department of Ecology.

4.5.3 Yard and Food Waste Composting: Clarified current contracting provisions for opt-out and end dates. Clarified history of changes regarding accepted materials and currently accepted. Added text about SPU continuing to encourage local compost product procurement for public projects

4.5.4 Recycling Processing Recommendations: Added recommendation to consider testing a "dirty" Materials Recovery Facility

4.5.4 Yard and Food Waste Composting: Expanded recommendation to support composting capacity development to include pursuing a competitive contracting process for services after the current contract ends

4.5.4 Yard and Food Waste Composting: Expanded recommendation to support food packaging changes to include enhancing contamination outreach and enforcement

4.5.4 Disposal: Modified second recommendation to "Do not pursue or authorize direct combustion of Mixed MSW. Do not authorize such facilities."

4.5.4 Disposal: Modified third recommendation to "Monitor and consider emerging conversion technologies."

Chapter 5 Other Seattle Solid Waste Programs

5.1 Construction and Demolition Debris (C&D)

5.1.2 Planning Issues: Restructured to include references to Resolution 30990 (*Zero Waste Resolution*) formerly discussed in 5.1.4 Alternatives and Recommendations

5.1.2 Planning Issues, Figure 5-2 Overlap of MSW and C&D Generation in Seattle in 2007 and 2010: Substituted 2010 figures instead for 2009 numbers. Corrected 2007 C&D Generation number.

5.1.2 Planning Issues, Figure 5-3 C&D Generation in Seattle in 2010 All Sources: Updated to reflect 2010 numbers instead of 2009. Explanatory text also updated.

5.1.2 Planning Issues, Table 5-1 C&D Generation in Seattle 2007-2010: Corrected numbers for 2007 and 2008. Explanatory text also updated.

5.1.2 Planning Issues, Figure 5-5 C&D Recycling Rates without Concrete in 2007-2010: Updated to include the year 2010.

5.1.2 Planning Issues, Table 5-2 C&D Recovery Rates by Material in 2010: 2009 numbers replaced with 2010 numbers.

5.1.4 Alternatives Development: Stakeholder involvement process revised and now includes discussion of the feedback process conducted for the Preview Draft of the Plan.

5.1.4 C&D Recommendations

- Restructured for better clarity
- Added detail to Certification recommendation
- Revised bans on metal and cardboard to 2013 from 2012
- Revised ban on clean wood to 2014 from 2013
- Added text explaining bans begin with 1 year of education before enforcement, and that the SPU Director may delay or rescind bans if end markets collapse.
- Revised to make explicit the recommendation to require DPD permit holders to file a recycling report as a condition for their Final Permit.

5.3 Clean City Programs

5.3.2 Planning Issues: Clarified funding source for clean city programs

5.3.3 Current Programs and Practices: Various text edits to improve clarity

5.4 Moderate Risk Waste

5.4.2 Planning Issues: Clarified history of the Local Hazardous Waste Plan and its updates.

5.4.3 Current Programs: Updated text to reflect the city's two MRW collection facilities now accept qualifying materials from CESQGs as well as residents.

5.4.4 Recommendations: Revised the first recommendation from "increase service hours" to "provide maximum number of service hours possible" for MRW collection services.

5.4.4 Recommendations: Revised second recommendation to drop reference to CESQG pilot and replace with text reflecting CESQG now collected on on-going basis

Chapter 6 Administration and Financing the Plan

Financing: Four figures changed to reflect updates budget, revenue, and customer rates impacts from revised recommendations, principally from removing the recommendation for single-family every other week garbage collection.

- Figure 6-6 Projected SPU Solid Waste O&M Spending
- Figure 6-7 Status Quo and Preferred Scenarios
- Figure 6-8 Average Rates for Status Quo and Preferred Scenarios
- Figure 6-8 Status Quo and Preferred Scenarios Revenue and Rate Projections

Appendices

Appendix C - Public Involvement: Now includes completed Public Involvement Plan and this Responsiveness Summary

Appendix D - Recycling Potential Assessment (RPA) Model and Environmental Benefits Analysis:

- Title changed from "Recycling Potential Assessment (RPA) Model". Merges former Appendix E.
- Added new write-up "Economic Analysis of New Waste Prevention and Recycling Programs" explaining the RPA model, the model for estimating environmental benefits, and the results of environmental benefits modeling.
- Substituted former RPA reports for recommended recycling program package with reports for revised recommended recycling program package

Appendix E - Recycling Reporting: Title changed from "Environmental Benefits Analysis"

Appendix F - State Environmental Protection Act (SEPA) documents: Title changed from "Recycling Businesses"

Appendix G - Seattle Solid Waste Advisory Committee (SWAC) Participation:

- Title changed from "State Environmental Protection Act (SEPA) documents"
- Added documentation of SWAC participation

Appendix H - Resolution of Adoption: Title changed from "Seattle Solid Waste Advisory Committee (SWAC) Participation"

Appendix I: Deleted. Was "Resolution of Adoption"

Public Involvement Plan (PIP) for the Solid Waste Management Plan Update

February 29, 2012

Seattle Public Utilities

THE CONNECTIONS GROUP
STRATEGY · MESSAGE · TARGET

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Executive Summary

This Public Involvement Plan documents the development and implementation of the process to gather public input for Seattle Public Utilities' update to its Solid Waste Management Plan (Plan). A comprehensive Public Involvement Plan (PIP) is crucial to the success of any public involvement effort. The ultimate goal of the PIP was to allow the public opportunities throughout the process to influence decisions and outcomes. The results of this PIP show a high degree of effectiveness from reaching beyond the minimum practice of general notices and general public meetings. Targeted direct contact with stakeholders and leveraging modern tools of social media has enabled SPU to gather feedback from a much larger scope of individuals. This PIP includes descriptions and results of those processes.

An important goal for outreach activities for this PIP was to move beyond traditional activities and find innovative new methods of engaging new stakeholder audiences who may provide a fresh and compelling set of perspectives. Along with reaching out to traditional stakeholders such as commercial and industrial customers, outreach activities were developed to target historically under-served and diverse populations, and the outreach methods were designed to be inclusive. Feedback garnered from PIP essentially met and in some aspects exceeded the PIP's goals. The PIP was developed in stages, and implemented in late summer through early fall 2011 when Seattle Public Utilities went public with the Preliminary Draft of the Plan.

Seattle Public Utilities engaged The Connections Group (consultant) to develop and implement a Public Involvement Plan (PIP) for the Solid Waste Management Plan update in June of 2009. The consultant's tasks and deliverables for stakeholder involvement and public review of the Preliminary Draft Plan included developing and writing a Public Involvement Plan (PIP) and then partnering with SPU to execute the PIP. A critical component of PIP execution included analyzing and writing this final report on the results of outreach activities.

An active partnership between the consultant and SPU project staff was developed throughout the PIP process. Between June of 2009 and February of 2012, the consultant worked with SPU project staff to:

- Conduct planning meetings and consultations with SPU staff, SPU Leadership, and others recommended by SPU.
- Develop, key stakeholder and general public targets.
- Develop outreach toolkits and conduct public outreach activities. Analyze outreach data and complete the Public Involvement Plan report

The following five chapters represent the sequential development and completion of the Public Involvement Plan.

Chapter 1 Introduction
Chapter 2 Detailed Overview and Approach
Chapter 3 Stakeholder Audiences
Chapter 4 Outreach Activities
Chapter 5 Closeout, Evaluation and Reporting

The 8 appendices at the end of the PIP include detailed documentation of the lists and tools used in the outreach process, as well as documentation of the Plan's web presence and social networking success.

Chapter 1. Introduction

1.1 List of Relevant Abbreviations

PITT: Public Involvement Task Team
PIP: Public Involvement Plan
RCW: Revised Code of Washington
SPU: Seattle Public Utilities

1.2 Regulatory Context, Policies and Code Requirements

State of Washington Regulatory Code: The State of Washington's RCW 70.95 says cities and counties must have comprehensive solid waste management plans. These plans must be reviewed every five years, and updated as needed. At this time Seattle Public Utilities (SPU) is planning the second amendment to Seattle's 1998 Solid Waste Management Plan. Seattle's plan was first amended in 2004. This Public Involvement Plan (PIP) describes the public outreach that will be done for the 2nd amendment. *Note: After this stage of PIP development began, the Washington Department of Ecology instructed SPU that the next plan update would be a revision, not an amendment.*

City of Seattle Inclusive Public Engagement Policy: The City of Seattle is committed to ending institutional racism. It is also committed to raising the numbers of community members who take part in civic affairs. To help these goals, the City of Seattle has an Inclusive Public Engagement Policy. This policy guides public engagement actions by City agencies, to ensure balanced and fair outcomes. The policy places special focus on traditionally under-served populations, people of color, immigrants, and refugee communities. It aims to increase access to information, resources, and civic processes for these groups.

This PIP will outline a plan for public engagement that follows these standards outlined by the City:

- The purpose of the outreach and public engagement activities will be clearly defined.
- Outreach and public engagement activities will provide fair and balanced chances and means for participation.
- Outreach and public engagement processes will be inclusive, and relevant to the varied cultures of the city. They will be well planned and carried out.
- The city will respect the time of community members.
- The city will inform participants about of the results of their engagement.
- The cultural assets and knowledge of communities will be honored and put to good use.

City of Seattle Translation and Interpretation Policy: The City's translation and interpretation policy says that all City Departments should translate vital documents into First Tier Languages.

There are seven languages other than English most commonly spoken in Seattle. These languages have been defined as First Tier by the Mayor's Office. They include Spanish, Cantonese, Mandarin, Vietnamese, Korean, Tagalog, and Somali. Sections of the public review draft of the solid waste plan amendment will be translated for stakeholders speaking First Tier Languages as required by policy.

The city sometimes does outreach education, or engagement that is specific to a neighborhood. When 5% or more of the people in that neighborhood speak a single language that is not English, the city will provide translation and interpretation. SPU will follow this policy when involved with neighborhood groups in the public review process for the solid waste plan update.

Next, City policy requires that invitations going to the public about community meetings say First Tier Languages interpreters will be provided. The City must be given five days advance notice in those cases. If SPU includes public meetings in the public outreach for the solid waste plan update, SPU will provide interpretation fitting the community's needs as required by policy. The above translations and interpretations will be provided free of charge to the public.

SPU considers the solid waste Draft Plan for Public Review to be a key undertaking of their public engagement efforts. They will pursue fair and balanced methods to involve all rate-payer segments as reviewers.

1.3 Public Involvement Task Team (PITT)

In order to fully document how the PIP was drafted and carried out, it is important to describe the PITT and to define the roles and responsibilities of each member. The PITT is composed of SPU employees as well as employees of the consulting firm, The Connections Group. The table below summarizes each of the team members' roles and responsibilities. More detail on roles and responsibilities is in sections 2.3.3 and 2.4.

Public Involvement Task Team				
Organization	**Name**	**Title**	**Role**	**Responsibility**
Seattle Public Utilities	Vicky Beaumont	Solid Waste Strategic Advisor	Solid Waste Comprehensive Plan Project Manager	Responsible for all aspects of amending Seattle's solid waste comprehensive plan.
Seattle Public Utilities	Jenna Franklin	Strategic Communications Advisor	Strategic Planning Advisor	Scope of work development, consultant selection, strategic advice and direction to PIP consultants; coordinating SPU internal communications resources
Seattle Public Utilities	Brett Stav	Solid Waste Communications Manager	Communications Manager for public review of the draft amendment.	Managing PIP consultants; planning, organizing, and implementing execution of the PIP.
Seattle Public Utilities	Erin McCoy	Communications Intern, Project Delivery Branch		Support for SPU Comprehensive Plan Core Team
The Connections Group	Cathy Allen	President and CEO	Lead Consultant	Messaging, training employees, community, focus groups, meetings, final outreach analysis, report and presentation
The Connections Group	Stanley Tsao	Vice President	Consultant	Training and outreach materials, production, budget, language

				community outreach, outreach reports
The Connections Group	Kathleen Paganelli	Account Executive	Consultant	Initial stakeholder identification, language community outreach, first point of contact for stakeholders, outreach and focus group logistics, outreach reports, account management & logistics

Team Operations: Formal check in dates and deadlines will be assigned to each task of writing and implementing the PIP. Depending on the task, the team may meet in person or communicate via phone or email on the day of the deadline. Team members will also discuss any issues that arise between deadlines via email or phone. All team members will have a chance to provide input on project decisions. The team will make decisions by consensus when possible. The SPU Project Manager will be the final decision maker.

1.4 Roles and Responsibilities

1.4.1 Agency Roles and Responsibilities

SPU is responsible for developing the Draft Plan for Public Review of Seattle's solid waste management plan update. The agency will also make sure the update's PIP complies with all City policies for public engagement. They will also make sure the PIP is carried out in full. Lastly, the agency will ensure that audiences understand how their feedback will be used – how it can impact the plan update.

1.4.2 Consultant Responsibilities

The Connections Group is responsible for developing and writing the PIP. The consultant and SPU will partner to execute the plan. The consultant will develop outreach techniques per the goals stated in the PIP, and go out into the field to execute those techniques. Consultant and SPU staff will work together to create any needed tools such as announcements, graphics, questionnaires, web pages, etc.

While outreach is on-going the consultant will prepare two types of reports. First are weekly summary reports. Second is a half-page report at the end of each outreach activity. The consultant will send these reports to the SPU project manager and SPU strategic communications manager. The consultant will also assist with compiling the reports' contents into the PIP's final report. Finally, the consultant will work with SPU to deliver the final report to the City Council and Mayor's Office.

1.4.3 Audience Roles and Responsibilities

Persons taking part in the outreach will be asked to provide thoughtful feedback about the Draft Plan for Public Review. This feedback will help SPU make the final draft of the plan update reflect the interests of as many Seattle ratepayers as possible. Feedback should focus on the best ways to reach solid waste goals while serving the community fairly.

Each stakeholder should provide feedback that reflects their own experience, or is specific to the community they represent. Stakeholders who are selected because they are a leader from a group of

people should be able to speak for their community. For example, stakeholders from neighborhood groups should be able to tell us about waste issues of note in their neighborhood. Stakeholders from the First Tier Language communities may be asked to tell us about how well SPU sends and receives information with those language communities.

Lastly, we will ask leaders about how they wish to stay in communication with SPU after the public review process is done.

Chapter 2. Detailed Overview and Approach

2.1 PIP Purpose

The purpose of this PIP is to put in writing how SPU will fulfill public review elements for its solid waste management plan update. It will also record the public review work actually done and the results of those activities.

The State of Washington (RCW 70.95) requires cities and counties with solid waste management plans to review them every five years, and update them as needed. The update process must include public involvement. This PIP outlines how SPU plans to engage stakeholders in the public review process for Seattle's update. The process aligns with other guiding policies and principles. These include WAC 365-196-600 Reviewing, Amending, and Updating Comprehensive Plans and Development Regulations.

2.2 Communications Goals

SPU's solid waste plan update public involvement process focuses on meeting the following communications goals:

- **No fewer than 100 diverse** members of the rate paying **public are communicated with.** Respondents will be in a position to speak as people who live in Seattle.
- **No fewer than 80 diverse** people are asked to be involved who are either SPU's Key Customer Accounts (**business and commercial** rate-payers) and/or are already engaged with SPU on solid waste topics as an individual or part of a group.
- **A diverse range of outreach activities** are selected that, clearly support SPU's commitment to upholding the policies described in section 1.2 of this document. Activities also reflect the minimum diversity standard of 17% participation from historically underserved communities.
- **Internal stakeholders are informed, educated and engaged** so that external goals for engagement can be supported and met. These include SPU and other city staff.
- **Initial assessments** of outreach activities are done **within 15 days** of activity completion so the team can make corrections toward better success.
- **"Statements of impact" are given to all respondents**. The statements will outline how their feedback folds into the process of updating the plan.
- **"Statements of explanation" are given to all groups and others who respond.** After the update is done, these statements outline how the plan will be used to shape future SPU solid waste services.
- **A tool will be created** that will allow SPU to maintain open and **ongoing lines of communication** with respondents who would like to be contacted in the future. The tool will also track stakeholder use of the tool.
- **PIP activities** will be **measured** through a post-outreach survey, data analysis, and activity critiques. A **report** will be written containing the results.

2.3 PIP Outreach Approach and Techniques

SPU will consider many potential outreach approaches and techniques. The pros and cons of each approach are discussed below.

The team will choose approaches that will best match the outreach goals within the limited outreach budget and staffing. Approaches should result in high quality feedback, from the most stakeholders. They should also be as equitable as possible.

The process for choosing approaches will be found in Chapters 3 and 4. The chosen approaches will also be explained. SPU will be flexible with approaches in case the outreach budget changes, or because results from an approach differ from what was expected.

2.3.1 Use of Public Notifications and Advertisements

SPU usually places two postings in the Daily Journal of Commerce for any formal public involvement process. SPU will consider this requirement and consider the following other public notifications and advertisements:

- Press opportunities to engage the larger media outlets such as the Seattle Times to inform customers about the PIP.
- The **Seattle Channel** for a special program on the Solid Waste Comprehensive Plan Amendment.
- A specific **solid waste management plan webpage** on the SPU website where the general public can sign up to review a chapter of the Draft Plan for Public Review.
- Notices about the Solid Waste Management Plan update on the **SPU blog** and direct interested parties to the plan webpage.
- **Neighborhood blogs** – create local blog stories where customers are directed to the plan webpage. Customers can also post comments directly on the blog page.
- **Internet banner advertisements** that will show only on Seattle websites and in local blogs that link to the plan webpage and invite the public to comment.
- **Targeted advertisements** in print media such as the Seattle Times with directions to the plan webpage.
- **Advertisements in the First Tier Language media outlets.**
- **New stories developed with ethnically oriented community groups,** and placed in the First Tier Language media outlets.

2.3.2 Use of Mail Surveys and Telephone Polls

While telephone polling or mail surveys provide a large quantity of data, they do not provide as high quality data as two way conversations. They are restricted to short questions and answers and SPU cannot ask customers why they answered one way or the other. In addition, they have a low response rate, which can cause them to be very expensive. On average, people polled amount to less than 18% of people called. A typical 12 minute telephone poll with 1,000 samples could easily cost $35,000 and more.

In addition, regular phone surveys often require English language fluency and a landline phone in the home. People being surveyed must also be home during a narrow window of time during the day or week. Many historically underserved peoples rely only on cell phone service. They also feel most fluent in languages besides English, or have non-traditional hours of being at home. More often than not, mail surveys return less than 5% of people mailed. They are a low return and high cost outreach technique. A standard mail survey with 1,000 samples could cost $15,000 and more.

2.3.3 Use of Public Engagement (2 way conversation/dialogue)

Two way conversations are a very good way to get feedback from customers about what is important to them. They allow for new ideas to emerge more easily and this will help SPU learn more about needs of specific communities. For example, First Tier Language communities, communities with diverse cultures, and certain city locales may have concerns that differ from each other.

SPU also believes qualitative data will be the most effective use of the consultant's limited budget. SPU expects that leading members of the community will have a very high response rate. Their responses will also be more insightful and targeted to specific communities than responses in a poll or survey. Lastly, SPU is excited to make use of more personal meetings to grow new, lasting relationships with diverse communities. A detached survey or poll would not be very effective at forming those lasting connections.

SPU will consider the following options for two way dialogue:

1) **Focus groups:**

   About three focus groups could be done within the consultant's contract budget, reaching only 45 people maximum. Without asking people to read the plan ahead of time (most would likely not), there would be a lot of material to get through in the time span of a typical focus group (1-2 hours). This would amount to a serious limit on the quantity and quality of review and feedback. Lastly, it could be complex to address the specific issues of diverse communities in a single conversation.

2) **Identifying and contacting stakeholders to review selected chapters:**

   Some stakeholders will be very easily recruited for this public outreach, and at a low cost. These include stakeholders inside SPU and the City, key customers, existing community contacts, and persons who opt in through the SPU website or blog post. Recruiting more new community contacts would be cheaper than a focus group, and could reach the same or a larger number of people. Individual talks will allow in-depth information to come forth about each group. This approach will make it much easier work new or clarified information into conversations.

The bullets below lay out who will do what for public engagement through two-way dialogue.

SPU will be responsible for the following tasks:

- Talking to core team members to brainstorm how to tap existing employee links to the community. Some staff may already be active members of community groups that are potential stakeholders.
- Developing materials such as talking points or a letter for staff to use when contacting existing contacts who are potential stakeholders.
- Requesting involvement from internal stakeholders.
- Requesting involvement from key customers.
- Requesting involvement from existing community contacts.
- Providing translated materials as necessary and distributing materials to neighborhood and community organizations.
- Training and working with the targeted 100 stakeholders for long term media strategies and recruiting them to be future endorsers or commentators for SPU.

The consultant will be responsible for:

- Figuring out a list of 100 stakeholders from the diverse populations with whom we wish to engage. These stakeholders will be leaders who can speak not only for themselves, but can provide insights into the wants and needs of their communities as a whole.
- Asking each stakeholder to review one or several chapter(s) of the updated plan.

- Creating and using more than one kind of review format based on what will work best for the particular stakeholder. For example, it may work best for a business person reviewing a finance chapter of the plan to answer an online survey and provide added feedback via email. On the other hand, it might be more strategic to have an SPU employee do a presentation and discussion with an activist from a neighborhood group.
- Providing training and assisting with the materials developed for SPU employees who will lead presentations and discussions.
- Working with SPU to develop any other materials such as online surveys.
- Documenting and reporting on all PIP activities in a PIP report that will be available to stakeholders.

2.4 Key Messages

The project team will develop key messages when the recommendations of plan updates are mostly complete. The overall key message is that the plan update retains the vision and goals of the original 1998 comp plan.

Who does what, SPU or the consultant, for developing key messages is in the rest of this section.

For a summary table of roles and responsibilities by team member, see the table in section 1.3.

SPU will be responsible for:

- Developing the Draft Plan for Public Review.
- Providing simple and clear summaries of the Draft Plan chapters for the consultant.
- Supporting the consultant in the development of relevant materials, graphics, and web pages – this is a shared responsibility.

The consultant will be responsible for:

- Working with the First Tier Language stakeholders to see if we have to adjust key messages for language communities.
- Working with SPU to develop key messages and materials.
- Working with SPU to review the Draft Plan for Public Review and find suitable chapters for various stakeholders.
- Supporting SPU in the development of relevant materials, graphics, and web pages – this is a shared responsibility.

2.5 Risks and Barriers

The purposed of this section is to list the potential risks and barriers that may prevent achievement of the PIP goals. It also includes present best ideas for dealing with the risks and barriers.

Risk	Description	Approach
PITT staff changes	Especially given the long time period between drafting and implementing the PIP, it is possible that there will be a change in PITT staff.	SPU and the Connections Group will carefully document all work in writing so that a new team member may easily pick up the project.

Funding changes	Significant budget changes would impact the scope of the PIP.	The Connections Group will draft a PIP that includes a wide variety of outreach approaches. SPU may draw from these approaches in the case that the PIP scope needs to be changed.
Significant Comprehensive Plan Amendment Re-writes	If the Comprehensive Plan Amendment is changed significantly in the middle of executing the PIP, some new material may not be covered.	Some of the approaches in the PIP are aimed at engaging interested parties at any time during the public engagement. For example, the PIP webpage and blog. SPU will be ready to assign new material to these stakeholders. This should cover the material not already being reviewed by the 100 recruited stakeholders.
Imperfect randomness	Stakeholders who sign up to review a chapter online are not random because they are self selecting. In the 100 stakeholder component SPU will ask organizational leaders to help us communicate with their members. Members of the same organization have certain traits in common, so we will not be reaching a truly random selection of individuals.	Selecting non-random stakeholders may not be bad for SPU. We aim to get feedback about particular neighborhoods and communities. However, SPU will also employ the broadest possible outreach approaches given our budget. We will engage the largest number of diverse customers possible.
Budget cut/staff changes	The PIP will raise expectations for future communication needs. If there are budget cuts, SPU may not have the resources to handle the additional demands. SPU may also not have the resources to follow up with all the new contacts after outreach.	Risk management strategies include making use of existing internal resources such as Community Relations Development and annual customer service surveys. And leveraging opportunities funded for other outreach efforts. To ensure contacts are maintained and budget cuts do not threaten the success and completeness of this effort.
First Tier Language communities and stakeholders not interested in the solid waste plan but have other priorities with SPU instead	Non-English speakers have a more difficult time communicating with SPU about service issues. They will understandably be eager to use the opportunity of communicating with SPU staff to raise any unaddressed issues.	SPU will train representatives who are doing community outreach to note any issues and tell customers that someone will get back to them. They will then ask the customers to focus on the review process so that service may be improved in their community in the future.

SPU will cause offense by not selecting certain stakeholders.	In the 100 stakeholder outreach, SPU will inevitably leave out individuals of organizations would have liked to be involved.	When faced with a question of why an individual or organization was not included in the 100 stakeholders, SPU will explain our goal of fairly representing different populations. (Perhaps another stakeholder who represents the same community was included). Then we will offer that person or group to take on a chapter for review.
Due to the long outreach timeline, organizations and their people (stakeholders) may change	SPU aims to avoid duplication of work that would occur if we recruited leaders from organizations too early and the leadership changed by the time of the outreach. There is also the potential that the selected organizations will cease to exist or change dramatically.	The consultant will prepare a list of stakeholders and contact information, but will wait until the outreach is about to take place before recruiting individuals. We will also collect information for a larger group of organizations than we need so that we can quickly select new organizations if needed.
Due to the long outreach timeline, opinions and public inputs may change.	Ideas and inputs received in the beginning of 2010 less relevant to changes implemented in the end of 2010.	SPU will encourage audiences to take a long term view when reviewing the Draft Plan for Public Review and explain when the next updates will be made.

2.6 Participation Goals and Metrics

This section defines each of the PIP participation goals. Participation goals are first defined by audience or stakeholder group. Then they are defined by what "successful participation" means for that group.

SPU's recruitment goals for this PIP reflect numbers that are in proportion to, or exceed, past SPU stakeholder feedback work. Setting the goals this way will allow SPU to appropriately measure against prior efforts.

"Successful Participation" for all audiences will include these aspects:

- Written feedback, by the respondent or written by outreach staff for them.
- The feedback expresses a feeling, position, or some other response.
- The feedback reflects that the respondent reviewed all of the plan section they agreed to look at.

Participation goals, level of review, and response will be measured on a point system. Goals reflect anticipated participation levels by group and level of existing engagement. For example, internal staff is highly engaged and would be expected to complete the assignment within the context of their job. In this example 25 participants multiplied by 20 points per review of the entire plan = a goal of 500 points for that audience segment.):

Points for amount reviewed

Review of Entire Plan = 20
Single Chapter Review = 15
Single Section Review (more than one paragraph and less than once chapter) = 10
Single Paragraph Review = 5
Failure to Complete Review = 0

Goals by Stakeholder Group

Stakeholder Group	Responses/Reviews Completed	Goal
Internal (SPU staff)	25	500 Points
Key Customers	25	370 Points
Existing Community	30	300 Points
Diverse Communities	100	500 Points

Audience segments that represent historically underserved stakeholder groups will be tracked by language or other demographic data. Data tracked will be the same as data collected in SPU customer surveys. This is to assess and report on the how well the campaign reached the inclusive outreach goals outlined in the Appendix 1. Language Diversity and in other sections of this document.

Consultant staff will initiate contact with the Diverse Communities and work with SPU to assign the appropriate chapter for each stakeholder to review. The consultants will be the point of contact for receiving feedback from these stakeholders. These stakeholders may also be leaders from organizations that have large memberships and strong internal communications mechanisms such as an email list and/or newsletter distribution. This will allow for participation tracking and reporting by community group or community leader. The team will then be better able to determine where inclusive engagement efforts were more or less successful.

Lastly, the consultant will identify and track the 100 diverse stakeholders' interests for a continued relationship with SPU. Such tracking and detailed records of all stakeholders will be used to solicit participation in post activity surveys. The surveys will help determine our overall success in reaching this PIPs communication and participation goals.

Chapter 3. Stakeholder Audiences

3.1 Definition of Affected Communities

Chapter two stated SPU's goal: that at least 180 stakeholders will review a portion of the solid waste plan update and provide feedback. The chart on page 11 separated those 180 stakeholders into these four groups:

- 100 diverse members of the rate paying public
- 25 people who are business and commercial rate-payers
- 30 people who are already engaged with SPU on solid waste topics
- 25 members of SPU's internal team

Feedback from participants in each of these groups will be important in unique ways. It is vital for SPU to get separate feedback from residential customers and commercial customers because they have very different solid waste needs. Likewise, people who are already engaged with SPU have special interests on specific solid waste topics. Lastly, the internal team is the most informed about how services are actually carried out by SPU. They can talk about the benefits and challenges of putting plan updates into action.

SPU also knows that different neighborhoods experience different issues with solid waste service. Within each of the groups described above, SPU will recruit stakeholders that represent neighborhoods as evenly as possible. (See list of neighborhoods in 3.5 Stakeholder Database).

Lastly, different businesses and organizations will have different interests in terms of solid waste services. Within each group and neighborhood, SPU will try to recruit individuals with a range of solid waste interests. The chart below shows each interest area and examples of organizations that serve those interests. SPU will identify individuals at these types of organizations as potential participants.

Stakeholder Interest Areas

Interest Area	Organization examples
Internal SPU	SPU Staff
General Public	Ratepayers
Public Affairs	Civic Groups Political action groups
Local Government Agencies	Other city departments Other local government (King Co., SKCHD)
Solid Waste Industry	Collectors Haulers Processors
Solid Waste Special Interest	Materials brokers Waste /recycling/organics technology developers
Environment, Livability and Growth Management	Neighborhood sustainability groups Environmental non-profits

Neighborhood	Neighborhood Institutions, Organizations and Councils Educational Organizations
Business	Business Associations Chambers of Commerce Business Owners
Media	Newspapers TV stations Radio stations Blogs
Faith Based	Faith based non-profits Places of worship
Groups that Produce Large Quantities of Waste	Property Owners Restaurants
Construction or Demolition	Construction of Demolition Companies
Historically underserved populations	Organizations that serve individuals who may have lack of access to service due to language, culture, race, ethnicity, social, economic, educational, medical, disabilities, or other issues Organizations with social justice missions For a list of languages see 3.5 Stakeholder Database.

3.2 Identification of Stakeholders

SPU and the consultant will identify more than 180 potential outreach participants. This is needed to guarantee responses from at least 180 stakeholders. SPU will be in charge of identifying potential participants in three of the stakeholder groups. Those are business and commercial rate-payers, people who are already engaged with SPU on solid waste topics and members of SPU's internal team. Existing lists will be the main source of information for these groups.

The consultant will be in charge of identifying diverse members of the rate paying public. This list will be inclusive as described in chapter one. It will also be balanced in terms of neighborhood and interest area. The consultant will identify potential participants using existing contacts and by planning new ones.

At the time of writing this chapter, existing lists from both SPU and the consultant had been combined to create an initial master list of 255 stakeholders. Existing lists from SPU included:

- Community Contacts
- Neighborhood Contacts
- Ethnically and Culturally Diverse Contacts
- Stakeholders Brainstormed by the Core Team for the Solid Waste Plan Update

Existing lists from the consultant included:

- Community Contacts
- Neighborhood Contacts
- Ethnically and Culturally Diverse Contacts
- Low-Income Assistance Contacts

- Civic Contacts
- Environmental Interest Contacts
- Youth Program Contacts
- School Contacts
- Business Contacts

As the identification of stakeholders continues, SPU and the consultant will work together to brainstorm and track overlap between groups. The project manager will be in charge of approving the final list of potential participating stakeholders before beginning outreach activities.

As described in 2.3.1 public notifications and advertisements will be used. This will make sure that outreach goes beyond the targeted stakeholders to the general public. Any rate payer who wishes to review the solid waste plan update and provide feedback will have the chance to do so.

Potential outreach participants will be identified based on their known stakeholder type. But at the time of outreach we may learn that some participants represent additional stakeholder types. For example we may learn that a stakeholder who was identified as a small business owner also speaks one of the Tier One or Tier Two languages. In order to track how inclusivity goals are being met, it is important collect complete information about each participant. SPU and the consultant will develop a standard set of demographic questions to be asked of every participant at the time of outreach. The protocol for asking those questions will also include a set of statements that explains the reason for collecting demographic data and assures participants that the information will be kept confidential.

3.3 Outreach Approaches

In order to reach the minimum 180 targeted stakeholders, SPU and the consultant will use many different outreach methods. SPU and the consultant will think carefully about which approach is best for each individual or group of potential participants.

Approach Name	Approach Description	Expected Use with Stakeholders
Transfer Station	Transfer station staff ask regular customers if they would like to take a section of the report home to review. They return it next time they come to the transfer station.	With neighborhood ratepayers.
Interview	One-on-one interview between project staff and participant. By phone or in person. Pre-arranged. Combination of pre-defined and open-ended questions.	With individuals (vs. groups) from various interest areas.
Meeting	Similar to interview but with a group.	With groups from various interest areas.
Email	Email individuals asking them if they would like to review a chapter.	With individuals who are representing their business and ratepayers who have emailed SPU in the past.

News Media & Blog or Website	Post the draft plan for public review on the web. Include a system for giving feedback online. Advertise the site in all outreach materials.	With ratepayers. Available to anyone who wants to comment but who was not included in targeted outreach.
Direct Mail	Selected neighborhoods will receive direct mail. It will invite them to visit the website or call SPU to participate in the review of the solid waste plan.	With neighborhood ratepayers.
Community Gathering	Asking individuals congregated in public places to review a small section (paragraph) or short summary of the plan and give feedback. Combination of pre-defined and open-ended questions.	In neighborhoods. Especially in those where it's been difficult to pre-identify other stakeholders.
Community Organization Office & Library & City Government Office	Outreach materials will be left at these locations for individuals to pick up if they are interested.	With ratepayers. Available to anyone who wants to comment but who was not included in targeted outreach.

3.4 Master Timeline for Outreach Activities

Below is an estimate of the order in which SPU and the consultant will complete the outreach tasks. The public draft document is in the process of being completed. Once it is ready the order of these tasks will be adjusted as needed and due dates will be assigned.

1. Finalize the stakeholder database
2. Populate the database with potential participants
3. Approve all potential participants and confirm that inclusivity goals are on track to be met
4. Message development for internal communication with target stakeholders
5. Training with SPU staff, Solid Waste Management Committee and/or others recommended by SPU
6. Write impact statements to be given to participants
7. Design any necessary outreach materials
8. Select appropriate section or summary of the solid waste plan update for each potential participant
9. Go online with the solid waste management plan webpage
10. Begin outreach

3.5 Stakeholder Database

SPU gave the PIP consultants an Access database to organize information about all of the individuals involved in this outreach process. That includes everyone targeted for review (whether or not they agree to participate). It also includes people who refer themselves to be a reviewer.

The purpose of the database is to track the status of review for each stakeholder. It will also be used to track how well inclusivity goals are being met among participants. Lastly, the database will allow the team to analyze outreach results by different parameters, such as neighborhood or historically

underserved population's categories. The database is flexible and will likely evolve as new stakeholders and new goals for analysis of the stakeholders are identified. Database fields and possible values can be changed. Currently the database includes the following fields:

Field type	Field	Possible Values
Basic Information	Name, Title, Organization	Fields for first and last Name Fields for phone, address, email, website
	Type of SPU account[1]	• Key account • Single family • Commercial business • Multi-family • Other
	Other	Preferred contact method or other contact notes
Targeted Populations	Type of stakeholder	• Internal SPU • General Public • Public Affairs • Local Government Agencies • Solid Waste Industry • Solid Waste Special Interest • Environment, Livability, Growth • Neighborhood Interest • Business Interest • Media Outlet • Faith Based Group • Large Volume Waste Producer • Construction/Demolition • Human Services Organization • Other
	Historically Underserved[2]	Does Not Represent Historically Underserved Language[3] • Amharic speaking • Cambodian/Khmer speaking • Chinese speaking • Japanese/Nihongo speaking • Korean speaking • Lao/Laotian speaking • Phaasaao speaking • Oromo/Oromiffa speaking • Russian/Eastern European speaking • Somali/af Soomaali speaking • Spanish speaking • Tagolog speaking • Thai/Phasa Thai speaking • Vietnamese

		Race/Ethnicity[4] • Black or African American • Asian • Native Hawaiian or Other Pacific Islander • Hispanic or Latino • American Indian or Alaska Native • Other • None • Senior • Youth • Low-income • African American • Other Immigrant/Refugee • Other
	Neighborhood Zone[5]	• Ballard • Northwest • North • Northeast • Lake Union • Magnolia/Queen Anne • Capitol Park/Madison Park/Miller/First Hill • Central Area/Squire Park/Madrona/Leschi • Duwamish/SoDo/Southpark/Georgetown • Jefferson/Beacon Hill/New Holly • Downtown Core/Pioneer Square/Downtown/Belltown • West Seattle – West of Delrigde • West Seattle – East of Delridge • Mount Baker/North Ranier/Seward Park • Columbia City/Rainier Beach, Other • Other
Outreach Process	Follow up needed	Yes/no
	Review by	Date
	Review points allocated	Per PIP chapter section 2.5 (0,3,5,10,15,16,17,18,20)
	Contact owned by	• Consultant • SPU • Mayor's Office • City Council • Other
	Method of contact	• Transfer station • In person • Meeting • Email • News media

		• Blog or website • Phone • Direct mail • Community gathering • Community organization office • Library • City government office • Other
	Level of review[6]	• Entire document (20 pts) • Multiple chapters (18 pts) • Multiple sections (17 pts) • Multiple paragraphs (16 pts) • Single chapter (10 pts) • Single paragraph (5 pts) • Declined (0 pts) • Other (3 pts)
	Status of review	• Declined • Accepted, not completed • Accepted, completed • Accepted, later declined • Unable to contact or lost

[1]Note: If a stakeholder represents two types of SPU accounts (for example a business owner who is also a ratepayer at home) they will be asked which perspective they wish to review the plan from.

[2]Note: Some stakeholders will fit more than one historically underserved category. The database includes a primary and secondary field for historically underserved.

[3] Languages include all Tier 1 and Tier 2 languages, meaning at least 2,000 Seattleites speak it.

[4]Race and Ethnicities include all that are included in the Census except White, which is not considered underserved.

[5]Neighborhood Zone (Defined by the Department of Neighborhoods).

[6]Level of Review (This field is the planned level of review, after review is complete, the correct number of points will be entered into the Review Point Allocated field).

The initial stakeholder list mentioned in 3.2 has been organized to include the same fields as the database for easy importing when the time comes to populate the database.

Chapter 4. PIP Outreach

4.1. Outreach Tools and Tactics

Overview

The project team created the initial stakeholder outreach list in chapter three in spring of 2010 and PIP outreach activities were initially scheduled for summer of 2010. The timeline for the PIP process, however, was extended due to a change of timeline at SPU to create the Preview Draft of the Seattle Solid Waste Plan and the related outreach tools.

The project team updated the stakeholder outreach list in spring of 2011 and added new community stakeholders from neighborhoods, historically underserved groups, businesses, and industrial customers. The final master list from both SPU and the consultant team grew to over 505 stakeholders from the initial list of 255 stakeholders in 2010.

The project team also decided to conduct a parallel outreach effort for construction and demolition debris (C&D) recommendations. A separate report documents those activities. However, there was some overlap in effort. The activities described in this PIP chapter were mainly for feedback on all the other Plan recommendations that pertain to municipal solid waste (MSW).

As stated in chapter two, the goal was to contact at least 180 stakeholders and have them review a portion of the draft Solid Waste Management Plan and provide feedback. In addition, SPU believes gathering data and speaking directly with targeted community stakeholders would be the most effective use of the consultant's limited budget.

The consultant team worked with SPU to develop the public outreach tools including draft chapters from Solid Waste Management Plan, announcements, questionnaires, online survey, website, and additional materials deemed important for the PIP outreach activities in July of 2011.

SPU created the website. Though not originally planned, the project team also created an online survey linked to the website, along with the planned dedicated email link. The website provided a convenient platform for stakeholders to review draft Solid Waste Management Plan materials and provide both quantitative and qualitative feedback. Response to the voluntary survey exceeded expectations, turning out to be the feedback method of choice for most respondents.

In summary, the project team provided a variety of ways for stakeholders to provide input during the PIP outreach process:

- An online survey at www.seattle.gov/util/SolidWastePlan
- Dedicated email addresses at SolidWastePlan@seattle.gov and spusurvey@connectionsgroup.org for stakeholders to send back specific comments and questions to SPU and the consultant team
- Presentations at community groups to share information and gather feedback.
- Intercept survey at transfer stations
- Feedback session with solid waste activists
- Feedback sessions SPU work groups

In all, SPU received about 23 written comments pertaining to MSW recommendations, plus others on C&D (documented separately). Comments from community group meetings are captured in those meetings' minutes. Nearly 600 people took the on-line survey between August 1 and October 9, 256 of

whom also gave comments. The transfer station survey gathered 99 responses and it concluded on October 15.

4.1.1. Roll-out and Announcements for Outreach Activities

SPU posted the Plan and dedicated email address on the Plan web page, on August 1, 2011 without announcement. SPU added the link to the on-line survey on August 9. On August 10, SPU issued a news release announcing the draft plan. The news release went out to all media outlets, and contained links to the online survey and draft chapters from Solid Waste Management Plan.

The consultant team began their PIP outreach activities on August 1, 2011 by starting to contact the stakeholders on the master list.

The project team did not purchase any media presence due to budget constraints. But several local news blogs and community websites posted the information about the plan and links to the survey and e-mail box.

See Appendix 2. SPU News Release on August 10, 2011.

4.1.2. Project Graphics and Identity/Brand

The project team did not develop graphics or other branding tools specific to the outreach effort. Any graphics used were copied from the Plan document. A key message included in outreach materials was that the plan would provide a "roadmap" to guide the city's efforts toward waste prevention, recycling, composting, and collections.

The Plan website was the most important tool for giving the Plan outreach identity. With various approaches necessary to engage the different stakeholders, the outreach team decided it was important to have one place where all stakeholders could review the draft Solid Waste Management Plan and provide feedback to SPU. The consultant team worked with SPU to set up the website with links to the online survey and dedicated email, and provided background and details of the draft Solid Waste Management Plan.

See Appendix 3. SPU Website.

4.1.3. Project Documents

Below is a list of project documents, stakeholder list and tools the project team used to conduct the PIP outreach process.

1. **Draft Solid Waste Management Plan – 2011 Revision**

    - Table of Contents
    - Executive Summary
    - Matrix of Recommendations
    - Chapter 1 – Revising the Plan
    - Chapter 2 – Seattle Solid Waste Trends
    - Chapter 3 – Waste Prevention
    - Chapter 4 – Managing Discards
    - Chapter 5 – Other Solid Waste Programs

- Chapter 6 – Administration and Financing
- Appendix A - Appendix A – Glossary
- Appendix B – Zero Waste Resolution 30990
- Appendix C – Public Involvement Report
- Appendix D – Recycling Potential Assessment (RPA) Model
- Appendix E – Environmental Benefits Analysis
- Appendix F – Recycling Businesses
- Appendix G – State Environmental Protection Act (SEPA) documents
- Appendix H – Seattle Solid Waste Advisory Committee (SWAC) Participation
- Appendix I – Resolution of Adoption

2. Master Stakeholder List

The master list contains over 505 stakeholders from the following interest areas:

Interest Area	Targeted Organization
Internal SPU	• SPU Staff
General Public	• Ratepayers
Public Affairs	• Civic Groups • Political action groups
Local Government Agencies	• Other city departments • Other local governments
Solid Waste Industry	• Collectors • Self Haulers • Processors
Solid Waste Special Interest	• Materials brokers • Waste /recycling/organics technology developers
Environment, Livability and Growth Management	• Neighborhood sustainability groups • Environmental non-profits
Neighborhood	• Community Family and Senior Organizations • Neighborhood Institutions, Organizations and Councils • Educational Organizations
Business	• Business Associations • Chambers of Commerce
Faith Based	• Faith based non-profits
Groups that Produce Large Quantities of Waste	• Property Owners • Restaurants
Construction or Demolition	• Construction of Demolition Companies
Historically underserved populations	• Organizations that serve individuals who may have lack of access to service due to language, culture, race, ethnicity, social, economic, educational, medical, disabilities, or other issues • Organizations with social justice missions • Language organizations
Large SPU commercial garbage accounts	• Various businesses in the city • Businesses generating plastic film

Between August 1 and October 15, 2011, the project team – including four SPU staff, one C&D consultant for plastic film, and four Connections staff – made multiple rounds of attempts to contact the 505 stakeholders on the master list.

Master stakeholder list in Excel file format is listed in Appendix 4. Master Stakeholder List.

3. Outreach Phone Script

The consultant developed a phoning script for use by the consultant and SPU staff for consistent messaging. Script goals were to establish relationship for on-going interaction, as well as to introduce the Plan and solicit feedback.

See Appendix 5. Outreach Phone Script.

4. Outreach Email

The consultant developed an email template for use by the consultant and SPU staff for consistent messaging and proper links to the online documents and feedback tools. The goals for the email template were to establish a new relationship with stakeholders, as well as to introduce the Plan and solicit feedback for the online survey.

See Appendix 6. Outreach Email.

5. SPU Meeting Materials

SPU developed handouts for the groups with which they met, sometimes tailoring them for the group. For instance, some handouts highlighted recommendations affecting the commercial sector for meetings with business representatives. Others included background data, such as for recycling performance. The core components of the meeting materials included

- List of key recommendations
- Matrix of recommendations by sector
- Outreach cards for reference to website and e-mail

4.1.4. Key Topic Questionnaire: 3-6 visioning or other statements to ensure focused consistent Feedback

As mentioned at the beginning of this chapter, the consultant team worked with SPU to develop the public outreach tools in July of 2011. The main goal of the tools was to provide a convenient platform for stakeholders to review draft Solid Waste Management Plan materials and provide both quantitative and qualitative feedback.

Toward this end the project team decided to have one master questionnaire, or survey, for use in the PIP outreach activities and added specific questions tailored to five targeted demographics:

1. Seattle resident of a single-family home (detached, or up to 4 units)
2. Seattle resident of a multi-family home (condo or apartment of 5 or more units)
3. Manager of a multi-family residence in Seattle (of 5 units or more)
4. Seattle business owner/manager
5. Construction and demolition (C&D) professional serving Seattle

The project team also developed a separate intercept survey for transfer station customers, to gain focused feedback on Plan recommendations targeting self-haul transfer station customers.

In total, the project team developed 2 surveys.

See Appendix 7. Surveys.

4.1.5. Comment Cards

The team did not choose comment cards as a tool for this effort. The team did, however, hand out hundreds of "business" cards advertising the Plan website and asking for feedback.

4.1.6. Display Boards or Posters

The project team did not produce any display board or posters for use in the PIP outreach process.

4.1.7. Website/Online presence

The consultant team worked with SPU to develop a website at www.seattle.gov/util/SolidWastePlan to coordinate and gather survey input. The website provides convenient links to all the chapters of the Draft Solid Waste Management Plan, the online survey, email addresses, and related materials at SPU. By having a comprehensive website, the project team was able to ask stakeholders and SPU customers to publicize the website and deliver the PIP outreach activities to a wider audience.

With the increasing online activities and the use of social networking tools, the project team also developed materials and templates for email forwarding and Facebook postings. Through outreach activities with our targeted stakeholders, the project team asked willing participants to email survey materials to their lists and post updates on their Facebook pages.

4.1.8. Other Outreach Channels and Tactics

Besides working with the consultant team, SPU developed materials and conducted additional outreach activities:

- Talking with core team members and employees
- Meetings with internal stakeholders such as the inspector team
- Presence at other SPU forums such as for key business and industrial customers and multifamily recycling training
- Items in SPU's electronic newsletters
- Items in SPU's and other city department blogs
- Soliciting in-depth reviews by SPU staff who weren't involved in developing the Plan

4.2. Outreach Activities

4.2.1 Outreach Meetings

From the outset, the project team decided that the most effective use of meetings was to piggyback on existing meetings of interested groups, especially for reaching historically under-represented populations.

The project team conducted 5 outreach meetings with community groups, and 5 other stakeholder groups between August and October 2011. These groups represent different interest areas and come from various geographical locations within the SPU service area. They include neighborhood and community organizations, a local area chamber, and a housing group. Most of the outreach meetings were arranged after initial contacts by the consultant team in August.

- Madrona Community Council
- Central Area Chamber of Commerce on September 12, 7pm at the 2100 Building
- Laurelhurst Community Club on September 12 at their board meeting
- Interbay Neighborhood Association on September 14 at their monthly meeting
- International District Housing Alliance on September 28
- Representatives from the local solid waste activism community
- Internal SPU work groups
- Other agencies (Sound Transit, Ecology)

The project team decided against staging any large, open invitation meetings, as an ineffective use of time and budget, and not useful for reaching a broad demographic perspective.

4.2.2. Workshops

The project team did not plan any workshops, for the same reasons as for not conducting open invitation meetings, above. While workshops can be useful for generating ideas, this outreach effort was to gain feedback on ideas already laid out in the draft Plan.

4.2.3. Intercepts and Dialogues

On October 1, October 4, October 8, October 11, and October 15, 2011, the consultant team worked with SPU to conduct intercept surveys at the SPU transfer stations. The survey teams conducted the survey in both English and Spanish, recording responses from a total of 99 transfer station users.

4.2.4. Surveys

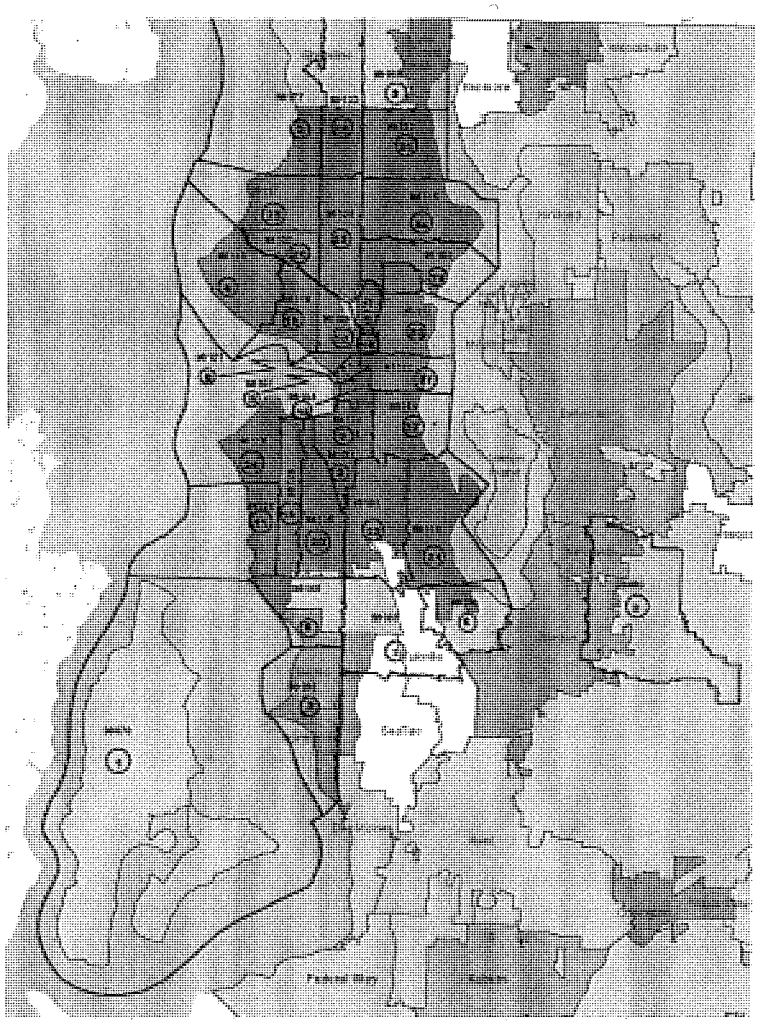
On-line Survey

In total, the project team collected over 593 online survey responses. 256 of the participants submitted comments with their responses. The responses were collected between August 1 and October 9, 2011 with majority of responses coming in before September 15, 2011. Of the 593 responses, here are the key demographics:

Group

Seattle resident of a single-family home (detached, or up to 4 units)	74.7%	443
Seattle resident of a multi-family home (condo or apartment of 5 or more units)	11.0%	65
Manager of a multi-family residence in Seattle (of 5 units or more)	3.2%	19
Seattle business owner/manager	2.4%	14
Construction and demolition (C&D) professional serving Seattle	0.7%	4
Other (please specify)	8.1%	48
	answered question	**593**
	skipped question	**0**

Zip Codes



Age

18-34	17.2%	94
35-54	48.1%	262
55-64	23.7%	129
65 or older	8.3%	45
Decline to answer	2.8%	15
	answered question	**545**
	skipped question	**48**

Gender

Male	33.3%	179
Female	60.1%	323
Decline to answer	6.5%	35
	answered question	**537**
	skipped question	**56**

Household Size

1	16.0%	86
2	39.0%	210
3	18.0%	97
4	14.8%	80
5 or over	6.7%	36
Decline to answer	5.6%	30
	answered question	**539**
	skipped question	**54**

Household Income

Under $30,000	3.4%	18
$30,000 – $39,000	4.1%	22
$40,000 – $49,000	5.8%	31
$50,000 - $59,000	4.7%	25
$60,000 to $75,000	12.8%	69
$75,000 – $100,000	18.8%	101
$100,000 and over	27.9%	150
Decline to answer	22.5%	121
	answered question	**537**
	skipped question	**56**

Education

Something less than high school graduate or GED	0.4%	2
High school graduate or GED	2.1%	11
Some college or technical school or AA degree	11.7%	62
4 year college degree	36.7%	194
Post graduate work or degree	49.1%	260
	answered question	**529**
	skipped question	**64**

Race/Ethnicity

White	81.1%	438
Black or African American	2.0%	11
Chinese	2.4%	13
Filipino	0.6%	3
Vietnamese	0.2%	1
Don't know	0.6%	3
Decline to answer	9.3%	50
Other (please specify)	6.1%	33
	answered question	**540**
	skipped question	**53**

Hispanic, Latino, or Spanish Origin

Yes	3.2%	17
No	86.7%	461
Decline to answer	10.2%	54
	answered question	**532**
	skipped question	**61**

Average responses to recycling recommendations by white versus non-white race categories.

Even though the survey was imperfectly random, the project team looked at nonwhite versus white reactions to select survey questions.

		Average Response		
Question	**Scale**	**Non-White**	**White**	**Overall**
Question 9 How satisfied are with Seattle Public Utilities' (SPU's) efforts to reduce waste and increase recycling and food and yard waste composting in Seattle?	1 – Not at all satisfied 2 3 4 5 6 7 – Very Satisfied	5.5	6.0	5.9
Question 10 How satisfied are you with Seattle Public Utilities' garbage, recycling and food and yard waste pickup services in Seattle?	1 – Not at all satisfied 2 3 4	5.5	5.9	5.8

	5 6 7 – Very Satisfied			
Question 11 This question is about garbage service for single family households (up to 4-plexes). Right now the City's Seattle Public Utilities picks up garbage on a weekly basis. They also pick up food and yard waste every Now that food scraps are allowed in the weekly yard and food waste service, the City's seattle Public Utilities is considering changing garbage to an every other week service. If this change is made, how satisfied would you be?	1 – Not at all satisfied 2 – Not very satisfied 3 – Somewhat satisfied 4 – Very satisfied 5 – Extremely satisfied	2.3	2.8	2.7
Question 13 Would you favor or oppose a plan that forbids food waste from being placed in the garbage container? Garbage containers with food and yard waste in them would not get picked up. Seattle already has similar rules about placing garbage in the recycling container and garbage in the food and yard waste container.	1 – Strongly oppose 2 – Oppose 3 – Favor 4 – Strongly favor	2.4	2.7	2.7
Question 15 Businesses are currently only required to recycle paper and cardboard. Would you favor or oppose a plan to require businesses to recycle more materials such as bottles and cans?	1 – Strongly oppose 2 – Oppose 3 – Favor 4 – Strongly favor	3.4	3.6	3.6
Question 17 Would you favor or oppose a plan to ask resident to put disposable diapers and pet waste into a separate collection container for pickup? The disposable diapers and pet waste would be composted using a process that kills bacteria and other pathogens.	1 – Strongly oppose 2 – Oppose 3 – Favor 4 – Strongly favor	3.1	3.3	3.3

Transfer Station Intercept Survey

SPU collected responses from 99 users of the city-owned transfer stations. Key demographics included:

User Group

Business or Personal Use	
Personal	64
Business	31
Both	2
Both	2
Grand Total	**99**

Age

Age Group	
18 to 34 years	14
35-54 years	57
55-64 years	19
65+ years	9
Grand Total	**99**

Race/Ethnicity

Race or Ethnicity	
Asian	3
American Indian or Alaskan Native	2
Black or African American	3
Pacific Islander or Native Hawaiian	1
White/Caucasian	75
Decline to Answer	3
Other (see notes)	10
N/A	2
Grand Total	**99**

4.2.5. Focus Groups

Due to budget and time constraints, the project team did not organize and recruit for any focus groups for the PIP outreach process.

4.2.6. Site Visits

As there is no specific physical "site" for the recommendations in the Plan, SPU did not conduct any site visits. The community groups SPU met with, however, met at their usual meeting place.

4.2.7. Other Initiatives

As outlined in Chapter 2.2, the project team wanted to ensure the PIP outreach process communicated with no fewer than 100 diverse members and solicit no fewer than 80 responses from diverse stakeholders.

From the online survey, the project team collected responses from:

- 5.2% immigrants (28 responses)
- 1.7% with some language other than English (9 responses)
- 3.2% Latino origin (17 responses)
- 11.3% from other diverse communities (61 responses)
- Plus over 100 participants who wouldn't say, skipped the demographic questions or declined to identify

Even though the transfer station intercept survey collected less demographic information, the intercept yielded:

- 19.2% diverse communities (19 responses)
- 16.2% Latino origin (16 responses)
- 8.1% primary language other than English (8 responses)

The project team did not collect demographic data on other outreach activities; however, feedback emails and community group meetings yielded comments from stakeholders that the project team considers diverse populations:

- Arab American Community Coalition
- Washington Low Income Housing Alliance
- Central Area Chamber of Commerce
- Madrona Community Council
- International District Housing Alliance

4.2.8. Web and Social Media/Networking Activities

Through the stakeholder outreach activities, the project team reached out and requested community contacts to share the draft Solid Waste Management Plan information with their networks.

Stakeholder groups such as Miller Park Neighborhood Association, Colman Neighborhood Association, Licton Springs Community Council and Seattle Immigrant and Refugee Board Liaison, Seattle Office for Civil Rights shared the PIP survey information and links with their email lists.

In addition, at least ten additional organizations posted blog stories and/or Facebook updates on their pages.

In all, about 19 groups, organizations, and other city departments posted a web page or Facebook item about the Plan, and/or forwarded Plan email messaging to their groups. This resulted in the effort reaching hundreds, perhaps thousands, more individuals than were reached by direct contact.

SPU also included items about the Plan in its two electronic newsletters, Apartment/Condo Conservation E-News, and the Curbwaste E-Newsletter. The apartment/condo newsletter goes out to about 250 recipients and Curbwaste to about 2,500 recipients. Newsletter recipients sign up to receive them from SPU.

See Appendix 8. Web and Social Media/Networking Activities.

Chapter 5. PIP Closeout, Evaluation and Reporting

This PIP was highly effective in reaching beyond the minimum practice of general notices and general public meetings, especially given limited staff and budget. Targeted direct contact with stakeholders and leveraging modern tools of social media enabled SPU to gather feedback from a much larger scope of individuals than by doing "business as usual." This chapter describes activities to wrap up this stage of public engagement and poise SPU for the public involvement aspects pertaining to the rest of the Solid Waste Plan adoption process.

5.1. Post Activity Documentation

5.1.1. Methodology for Analyzing Public Comments

At the conclusion of the PIP outreach and stakeholder engagement process, the SPU project team compiled comments and survey results into two summary documents: one for Municipal Solid Waste (MSW) and the other for Construction and Demolition Debris (C&D).

Comments for the MSW summary document are sorted by the Plan's chapters and sub-categories such as Recycling Goals, Planning Process, Measurement Data, Green Purchasing, Hazardous Waste, Product Stewardship, Waste Prevention, Recycling Recommendations, and Construction Demolition Debris.

Comments for the C&D summary document are sorted by theme categories such as Existing Policy, Basis for New Policy, Proposed New Programs, Proposed New Program Implementation, and Material Specific Disposal Ban Questions.

In addition to public and stakeholder comments, the Solid Waste Advisory Committee (SWAC) also reviewed the documents and gave SPU project team comments about the survey and other feedback results.

Notable changes to the Solid Waste Management Plan relating to public comments will be highlighted on SPU's website with the two feedback summary documents for MSW and C&D.

5.1.2. Documentation of and items collected from PIP Outreach Activities

The project and consultant teams produced and collected the following documents during the PIP outreach process:

- Draft Solid Waste Management Plan
- A master stakeholder list
- A new web page and an online survey document at www.seattle.gov/util/SolidWastePlan
- Presentation materials for community groups to share information and gather feedback
- News release
- Template announcements and invitation emails
- Intercept survey document at transfer stations
- Web and social media/networking postings by community groups
- Summary of stakeholder outreach feedback
- Transfer station survey report
- Final summary comments and survey results reports

Most of these documents may be viewed in the appendices. As noted above, the MSW and C&D feedback summaries can be viewed by going to SPU's Solid Waste Plan web page at www.seattle.gov/util/SolidWastePlan.

5.1.3. List of changes or modifications to master time-line for PIP stakeholder outreach activities

Change of Timeline

The project team began this PIP in June of 2009 and completed the overview and approach (chapters one and two) at the end of 2009. The project team then created the initial stakeholder outreach list in chapter three in spring of 2010 and PIP outreach activities were initially scheduled for summer of 2010. The timeline for the PIP process, however, was extended to 2011 due to a change of timeline at SPU to create the Preview Draft of the Seattle Solid Waste Plan and the related outreach tools.

The project team regrouped and updated the stakeholder outreach list in spring of 2011 and added new community stakeholders. PIP outreach activities were rescheduled for summer of 2011 and the project team finally executed the PIP outreach and stakeholder engagement process between August and October of 2011.

Upon completion of the PIP outreach activities, the project team then spent the end of 2011 and January of 2012 to complete the summary reports and analysis of PIP results.

In short, the final PIP process was extended from the original 18 months timeline to 32 months in total (June of 2009 to February of 2012). Lastly, many of the outreach activities were conducted during August of 2011 when many stakeholders were on summer vacation.

Staff Change

While the extended PIP outreach process took over 32 months, the consultant team was faced with a staff change. And the SPU communications staff who was key to the PIP's concepts and initial development also left. All PIP documents were maintained so that new team members could easily continue.

Limited Budget

Some of the approaches and public notifications listed in Chapter 2, such as focus groups, various surveys, and advertisements were not conducted due to a limited budget. As a result, PIP outreach activities had to rely mostly on earned media, an online survey, and direct outreach activities conducted by the project team.

Building and Editing the Stakeholder List

Due to the long outreach timeline, the project team had to spend additional time to edit and contact stakeholder groups before conducting outreach activities. Between 2010 and summer 2011, many community organizations had changes in leadership and contact information. The project team had to duplicate some of the previous work done in 2010 and collect new details for the stakeholder list again in 2011.

Imperfect Randomness

The project team collected 593 responses from the online survey, 99 responses from transfer station users, and comments from at least 10 community organizations and groups, throughout the PIP process.

However, with limited paid notifications and outreach approaches, there is a risk stakeholders who signed up and responded were self selecting and we may not have reached a truly random selection of individuals.

Language Barrier and Online Access

The project team reached out and worked with all the targeted language and historically underserved populations during the PIP process. However, due to a limited budget, non-English and historically underserved community stakeholders may still have a more difficult time communicating and accessing the survey information online.

5.2. PIP Final Filings, Outcomes and Recommendations

This final PIP report will be included in the Preliminary Draft of the Solid Waste Management Plan to be submitted by SPU to Washington State Department of Ecology in spring of 2012.

5.3. PIP Closeout and Reporting Plan

Upon completion of the current PIP process and the public review elements, SPU will follow the steps below to continue the Solid Waste Management Plan Update process:

1. Complete revisions per Washington State Department of Ecology comments.
2. Complete State Environmental Protection Act (SEPA) requirements checklist.
3. Present Final Draft to City Council with resolution.
4. Present with City Council at a public hearing.
5. Submit Final Draft to Washington State Department of Ecology.

At minimum, SPU will make copies of the Preliminary Draft Plan available to Seattle's SWAC members and Public Health – Seattle and King County, as well as to the public on SPU's website. Hardcopies will be available at SPU's offices and at the Seattle Public Library. SPU will track any comments received for at least 30 days after the Preliminary Draft goes public. SPU will also meet with groups who want to learn more and discuss the plan. These activities will be conducted in coordination with the SEPA process as needed.

SPU will plan and conduct (as appropriate) additional public involvement processes because of significant changes stemming from the Plan adoption process, or direction from the Washington Department of Ecology.

SPU could also consider additional outreach opportunities and public engagement efforts during the remaining Solid Waste Management Plan update process. SPU could work with the project team to assess, organize and implement further outreach process and strategies. Potential outreach activities could include:

- Publicize Solid Waste Management Plan Update process timeline and develop an outreach strategy (from emails to regular web postings) to update PIP process participants.
- Engage stakeholders for additional comments upon Washington State Department of Ecology reviews.
- Develop ongoing dialogue with PIP process participants and potentially set up a citizens' panel to provide regular feedback and comments to SPU.

- Produce public outreach materials such as short video clips to showcase key comments from PIP process participants.
- Show PIP process participants the Final Draft before presenting to City Council.
- Invite PIP process participants to appear at City Council public hearing.

PIP Appendix 1. Language Diversity

The breakdown of Tier One language groups is as follows:

Spanish
According to the U.S. Census 2005-2007 American Community Survey, 5% of Seattle residents, or 26,807 people, speak Spanish at home. The highest concentration of Spanish speakers in Seattle lives in the South Park neighborhood where 30.27% of people speak Spanish in their homes. Out of the 115,143 residents who do not speak English, Spanish speakers account for approximately 23%. Based on this information, out of the 20-30% of non-English speakers, SPU recommends that no less than 20% and no more than 30% be included in this profile.

Cantonese and Mandarin, Vietnamese, Korean and Tagalog
Ten percent of Seattle residents, or 55,432 people, speak an Asian or Pacific Island language at home. Out of the 115,143 residents who do not speak English, Asian or Pacific Island language speakers account for approximately 48%. However, there is no information on the breakdown of the language included in this group. Based on this information, SPU recommends that no less than 45% and no more than 50% of non-English speakers in the profile be Asian or Pacific Island language speakers.

Using information provided by the Department of Neighborhoods, it is possible to determine which areas of the city have the highest concentration of various Asian languages groups.

Somali
There is no data available regarding Somali. The Dept. of Neighborhoods classifies all African languages in one group. Out of the 115,143 residents who do not speak English, African language speakers account for approximately 48%. SPU will determine the percentage non-English speakers in the profile be African language speakers in a latter date.

Racial and Ethnic Diversity (based on the 2000 Census)

In the Seattle area, 146,655 people, or 26%, are identified as non-white. Since many non-whites speak English, we recommend that at least 20% and no more than 30% of the individuals in this profile are non-white and speak English. The racial and ethnic breakdown is as follows:

Asian
Out of the non-white population in Seattle, 46%, or 76,170 people identified themselves as Asian. Another 1.9 percent indicated that they were of more than one race including Asian. The largest group of Asian descent in Seattle is Chinese followed by Filipino, Vietnamese, Japanese, Korean, and Asian Indian. Based on this information, SPU recommends that among the races represented in this model, no less than 42% and no more than 50% of Asians be included in this model.

Black or African American
Blacks or African Americans comprise 26%, or 43,937 residents, of Seattle's non-white population. Another 1.4 percent of Seattle's populations selected black in combination with one or more other races. Based on this information, SPU recommends that no less than 22% and no more than 30% be included in this profile.

Hispanic
Hispanics comprise 21%, or 35,012 residents, of Seattle's non-white population. Hispanics can be of any race. The Census finds the majority of the city's Hispanics have origins in Mexico. The next largest group is of Puerto Rican origin followed by those of Cuban descent. Based on this information, SPU recommends that no less than 17% and no more than 25% be included in this profile.

Native American or Alaskan Native
Native Americans or Alaskan Natives comprise 3%, or 5,197 residents, of Seattle's non-white population. Another 1.1 percent of the Seattle population chose Native American or Alaska Native as well as at least one other race. Based on this information, SPU recommends that no less than 1% and no more than 5% be included in this profile.

Native Hawaiian or other Pacific Islanders
Native Hawaiian or other Pacific Islanders comprise 1%, or 2,334 residents, of Seattle's non-white population. Samoans formed the largest group followed by Native Hawaiians and Guamanian or Chamorro. Another 0.4 percent, nearly 5,000 people, chose Native Hawaiian or other Pacific Islander along with one or more other races. Based on this information, SPU recommends that no less than 1% and no more than 3% be included in this profile.

Education

Many residents of Seattle have attained very high levels of education. In 2005, 91.9% of persons over the age of 25 living in Seattle had completed high school. In addition, 52.7 of people had a Bachelor's degree or higher. SPU will determine the percentages of populations with a high school degree and a Bachelor's degree in a latter date. However, racial differences undercut these figures somewhat. Among non-whites, 37% of Asian and Pacific Islanders have at least a Bachelor's degree, 26% of Hispanics, and 20% of Blacks and African Americans. Therefore, within each racial and ethnic group, we recommend the following be incorporated into the profile:

- Among Asians, at least 30% and no more than 40% have a Bachelor's degree;
- Among Hispanics, at least 20% and no more than 30% have a Bachelor's degree; and
- Among Blacks and African Americans, at least 15% and or more than 25% have at least a Bachelor's degree.

Economic Status

In 2008, the median family income for metropolitan Seattle (which includes Seattle, Bellevue, and Everett) was $81,403. Therefore, anyone earning less than this amount can be considered underserved. SPU will determine the percentage of individuals representing populations earning less than the median income in a latter date.

Geography/Neighborhoods

SPU will break the City up into Northwest, Northeast, West, East, Southwest, and Southeast regions. This follows the Department of Neighborhoods breakdown (http://www.seattle.gov/neighborhoods/net/). When selecting stakeholders from community and neighborhood organizations, we will strive for even representation across these regions.

PIP Appendix 2. SPU News Release on August 10, 2011

NEWS ADVISORY

FOR IMMEDIATE RELEASE:
FOR MORE INFORMATION CONTACT: SPU Customer Service (206) 684-3000

Survey asks how to create a cleaner and greener Emerald City
Seattle Public Utilities seeks input about best ways to reach 70 percent recycling

SEATTLE – Seattle Public Utilities (SPU) wants to hear from residents and businesses about waste reduction, recycling, and other solid waste services. The 2011 draft revision of Seattle's Solid Waste Management Plan is available on SPU's website.

"Our ambitious solid waste goals are another example of the high expectations that the people of Seattle rightly have for our public utilities. Good planning and dedicated citizens are how Seattle achieves these goals," said Seattle Mayor Mike McGinn.

The Solid Waste Management Plan updates the City of Seattle's programs to prevent waste, increase recycling and composting, and improve services. It describes the roadmap that will guide Seattle to its goal of diverting 70 percent of all municipal solid waste away from the landfill. The current timeline to achieve this rate is 2025, but the draft plan proposes moving the time frame up to 2022.

"This revised plan further strengthens the key concepts of zero waste, waste prevention, sustainability, and product stewardship – which were initially developed over a decade ago by a wide group of stakeholders," McGinn added. "The public comment process is how we work together, as a city, to figure out how to get there."

SPU is providing a variety of ways for people to provide input: an online survey; a dedicated e-mail address at SolidWastePlan@seattle.gov; and working with community groups to share information and gather feedback.

"Citizen action is what has spurred Seattle to become a national leader in recycling and composting. I'm confident that the input provided by the people of Seattle will further improve a plan that continues to guide the City well," said City Councilmember Mike O'Brien, Chair of the Seattle Public Utilities and Neighborhoods Committee.

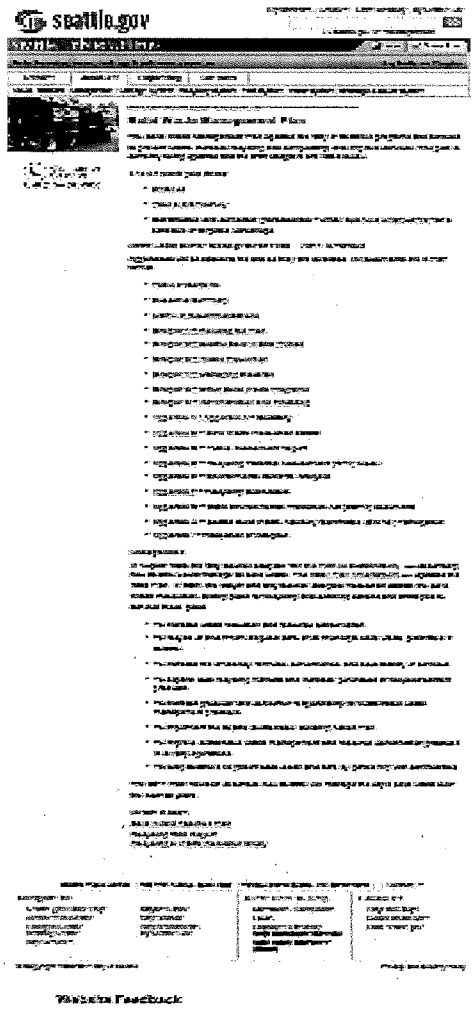
Learn more about Seattle Public Utilities. Follow SPU on Twitter.

In addition to providing a reliable water supply to more than 1.3 million customers in the Seattle metropolitan area, SPU provides essential sewer, drainage, solid waste and engineering services that safeguard public health, maintain the City's infrastructure and protect, conserve and enhance the region's environmental resources.

- SPU-

PIP Appendix 3. SPU Website

www.seattle.gov/util/SolidWastePlan



PIP Appendix 4. Master Stakeholder List

Organization Name
1111 Third (CB Richard Ellis)
505 Union Station (CB Richard Ellis)
Additional Seattle Orgs of Potential Interest
Administration for Children & Families Region 10
Admiral Neighborhood Association
African American Reach and Teach Ministry
Alcoa Primary Metals, Intalco Works
Alexandria Real Estate Inc
Alexis Hotel
Alki Community Council
All on Gabriella's C&D list
All our licensed recyclers, such as Total Reclaim
All Wood Recycling
Alley24 East
Alliance for a Just Society
Allied
Allied Waste
American President Lines
American Roofing Recyclers
American Seafoods Inc
Amgen Inc
Amtrak
Arab American Community Coalition
Arts Corps
Ashforth Pacific, Inc
Ashgrove Cement
Asian Counseling and Referral Service
Asian Pacific Islander Women and Family Safety Center
Associated General Contractors
Association of General Contractors (AGC)
Atlantic Street Center-New Holly Youth and Family Center
Baby Diaper Service
Ballard Chamber of Commerce
Beacon Alliance of Neighbors
Belltown Business Association
Belltown Community Council
Benaroya Hall
Bental LLC
Biosolids folks
Bobby Wolford Trucking and Demolition
Boeing Company
Boeing IDS
BOMA
Boys and Girls Club
Bristol-Myers Squibb Company

Broadmoor Country Club
Broadview Community Council
Burlington Northern Santa Fe Railroad
Bush, Roed and Hitchings Inc.
CAC Real Estate
CalPortland
Capitol Hill Community Council
Capitol Hill Housing
Carwash Enterprise (Brown Bear)
Casa Latina
Cascade Land Conservancy
Cascade Water Alliance
Cascadia Consulting
Catholic Community Services of Western WA
CB Richard Ellis
CB Richard Ellis Global Corporate Services
CBRE
CDL Recycle
Cedar Grove Composting Co.
Center for Environmental Law & Policy
Center for Livable Communities
Central (Seattle) Area Chamber of Commerce
Central Pget Sund Rgonal Trnst
Certainteed Gypsum
Chamber of Commerce Sustainability Committee
Charlie's Produce
Childrens Hospital
Chinatown Business Improvement Area
Chinese Information Service Center
CleanScapes
Climate Solutions
Clipper Seafoods Ltd
Clise Properties
Colman Neighborhood Association
Columbia City Business Association
Construction Materials Recycling Association
Construction Waste Management, Inc.
Cool Moms
Council for Children and Families
CP Management
Cray Inc
CRISTA Ministeries
Crista Ministries
Crown Hill Neighborhood Association
Crowne Plaza Seattle-Downtown
Darigold Inc
Deloitte & Touche LLP
Delridge Neighborhoods Development Association (DNDA)

Dendreon Corporation
Department of Planning and Development: Green Building Team
Department of Social and Human Services -Community Services Offices-Rainier
Dept. of Neighborhoods
Dhl Danzas Air & Ocean
Downtown Nordstrom
Downtown Seattle Association
Drywall Recycling Systems
Dyna Care Lab Northwest LLC
Eagle Marine Services Ltd
Earth Corps
Earth Justice
Earth Ministry
Earthwise
East African Alliance
East African Community Services
Eastlake Community Council
Edgewater Inn
El Centro de la Raza
Elliott Bay Marina
Emerald Services Inc
EMP/SFM
Enterprise Seattle
Environmental Coalition of South Seattle
Environmental Justice Network in Action
Environmental Outreach and Stewardship Alliance
Ethiopian Community Mutual
Expeditors Intl Wash Inc
Facing the Future: People & the Planet
Fairmont Olympic Hotel
Fauntleroy Community Association
Federal Reserve Bank of San Francisco
Federated Dept Stores Inc
Filipino Community Center
Food & Beverage groups
Foss Home & Village
Foss Maritime
Four Seasons Hotel
Franz Bakers
Fred Hutchinson Cancer Res Ctr
Fred Meyer
Fred Meyer Stores Inc
Fremont Chamber of Commerce
Fremont Neighborhood Council
Friends of the Cedar River Watershed
Full Life Adult Day Care
Futurewise

FX McRory's
General Services Administration
Georgetown Community Council
GIRVIN Creative Marketing
Golden Alaska Seafoods Inc
Gordon Biersch Brewing Company
Grand Hyatt Seattle
Grayhawk Construction
Greater Duwamish Council
Greater Glory Church of God
Greater Madison Valley Community Council
Greater Seattle Chamber of Commerce
Greenwood Community Council
Greenwood-Phinney (Seattle) Chamber of Commerce
Group Health Co-Operative
GSA Federal Courthouse (new)
Haller Lake Community Club
Hanjin Shipping Company Ltd.
Harborview Medical Center
Harman Management (Yum Yum Foods)
Hawthorne Hills Community Council
Helping Link
High Point Neighborhood Association
Highland Park Action Committee
Highland Park Improvement Club
Hillman City Neighborhood Alliance
Hilton Hotel
Hines, Inc.
Hoffman Construction Company of Washington
Home Builders Assoc.
Horizon House
Hospital Central Service
Hotel 1000
Hotel Andra
Hoteliers
Housing Auth of The Cy Seattle
Housing Development Consortium
Housing Resources Group (HRG)
Inn At The Market
Interbay Neighborhood Association
International District Housing Alliance
Jackson Place Community Council
JC Penney Corporation Inc
Jewish Federation of Greater Seattle
JSH Properties (Aurora Square)
Judkins Park Community Council
Junior League of Seattle
K&L Gates LLP

K2 Sports
KC Recycling Coordinators
Keller CMS, Inc.
Kendall Trucking
King County
King County DNR Director Office
King County Health Dept
King County Industrial Waste Program
King County International Airport
King County Solid Waste Division
King County Transit
Korean Women's Association
Korry Electronics Co
Lafarge Corp
Lafarge North America
Lake Union Drydock Company
Lakewood / Seward Park Community Club
Laurelhurst Community Club
League of Education Voters
League of Women Voters
Lease Crutcher Lewis
Licton Springs Community Council
Local Hazardous Waste Management Program (LHWMP)
Low Income Housing Institute (LIHI)
MacDonald Miller Facility Solutions
MacMillan-Piper
Madrona Community Council
Magnolia Community Club
Magnolia Neighborhood Planning Council
Manufacturing Industrial Council
Maple Leaf Community Council
Marpac Construction LLC
Martin Selig Real Estate
Martin Smith Real Estate Services
Master Builders
Master Builders Assoc of King & Snohomish Cty
Mayflower Park Hotel Inc
McDonalds-MCD Corporation
Meadowbrook Community Council
Metropolitan Park Buildings (Wright Runstad & Co.)
Metropolitan Tower
Miller Park Neighborhood Association
Montlake Community Club
Morgan Community Association
Mount Baker Community Club
Mt. Baker Housing Association
Muni League
N & S Rebuild Stakeholder Grps

National Marine Fisheries Svc
National Marine Fisheries Svc
NCAST Programs
Neighborhood House
New Futures
New West Gypsum
Nickels Bros House Moving
Nitze-Stagen
NOAA
NOAA National Marine Fisheries Svc.
NOAA (NOAA Montlake) (NOAA Sandpoint)
Noel House
Nordstrom
North Beacon Hill Council
North Delridge Neighborhood Council
North Seattle Community College
North Seattle Rotary
Northgate Mall
Northland Services Marine Transportation
Northwest Energy Efficiency Council
Northwest Environmental Education Council
Northwest Hospital
Northwest Kidney Centers
Northwest Product Stewardship Council
Northwest Seafood Processors
NUCOR
Nucor
Nucor Steel
Nuprecon
NW EcoBuilding Guild
Office of Economic Development (OED)
Office of Sustainability & Environment (OSE)
Othello Neighborhood Association
Pacific Construction Systems
Pacific Medical Center Clinic
Pacific Science Center
Pacific Topsoils
Packaging groups
Parent Trust for Washington Children
Park Place Bldg (Wright Runstad and Co)
PEMCO
People for Puget Sound
Pepsi Bottling Group
Pepsi-Cola Metro Btlg Co Inc
Peter Pan Seafoods Inc
Phinney Neighborhood Association
Pierce County solid waste
Pigeon Point Neighborhood Council

Pinehurst Community Council
Pioneer Square. Community Association
Plymouth Housing Group (PHG)
Polyclinic A Professional
Pomegranate Center
Port of Seattle
Ports America T-46
PPRC - Pollution Prevention Resource Center
Processors (e.g. metal) who aren't on our recyclers list
Puget Sound Blood Ctr Program
Pyramid Breweries Inc
Queen Anne Chamber of Commerce
Queen Anne Community Council
Queen Anne Plaza Inc
Quest Dgnstics Clnical Labs De
Qwest Field
R.W. Rhine Inc.
RAFN Company
Rainier Valley Chamber of Commerce
Rainier Vista (Seattle Housing Authority)
Rainier Wood Recyclers
Ranier Vista (Seattle Housing Authority)
Ravenna-Bryant Community Association
Recovery 1
Recreational Equipment Inc
Refugee Federation Services Center
Regence Building
REI (current)
Renton Concrete Recyclers
Resource Recovery Services
Restaurant Association
Riverview Neighborhood Council
Roosevelt Neighborhood Association
Roosevelt Neighbors' Alliance
Rosetta Inpharmatics LLC
Safeco Plaza (1001 Fourth Avenue)
Safeway
Saint Gobain Container LLC
Salaam Urban Village Association
Samuel & Company, Inc.
SBRI
Schwartz Brothers Restaurants
Sea Mar Community Health Center
SeaFreeze
SeaTac Airport, Aviation Facilities & Infrastructure
Seattle Aquarium
Seattle Art Museum
Seattle BioMed

Seattle Biomedical Res Inst
Seattle Cancer Care Alliance
Seattle Center
Seattle Center - Redevelopment
Seattle Central Community College
Seattle Children's Hospital
Seattle Chinatown International District Preservation and Development Authority
Seattle City Light
Seattle Community College, South
Seattle Community Colleges
Seattle Department of Transportation
Seattle Finance & Admin
Seattle Fleets & Facilities
Seattle Hilton Hotel
Seattle Housing Authority (SHA)
Seattle Iron & Metals Corp
Seattle Mariners
Seattle Pacific University
Seattle Parks and Recreation
Seattle Parks Department
Seattle Public Library
Seattle Public Schools
Seattle School Board
Seattle School District
Seattle Seahawks
Seattle Skyline Rotary
Seattle Steam
Seattle Tennis Club
Seattle Tilth
Seattle University
Seattle Works
Second Use Building Materials
Sellen Construction Co.
Seward Park Environmental & Audubon Center
Sheraton Hotel
Shoreline Community College
Shoreline School
Sierra Club - Cascade Chapter
Sightline Institute
Skanska
SKCDPH (health dept) – as required by law
Snohomish County solid waste
SODO Business Association
Solid Ground
Somali Community Services of Seattle
Sound Transit
South Lake Union Chamber of Commerce

South Park Business Association
South Park Neighborhood Association
South Seattle Community College
Space Needle Corporation
Space Needle Corporation
Spaghetti Factory
SPU EA Meeting
Ssa International Inc
Starbucks Coffee Co
Stevedoring Services of America
Stewardship Partners
Stouffer Madison Hotel
Sunset Hill Community Association [Ballard]
Supreme Alaska Seafoods Inc
Sustainable Ballard
Sustainable Downtown Seattle
Sustainable Greenwood-Phinney
Sustainable Queen Anne
Sustainable Seattle
Sustainable South Seattle
Sustainable West Seattle
Swedish Medical Center - Providence Campus
Swedish Medical Center-First Hill
Swedish Medical Center-Providence
Swedish Health Services
Swedish Hospital
Swedish Medical Center
Swedish Medical Center - Cherry Hill
Swedish Medical Center- Ballard
Swedish Medical Center- Ballard
Swedish Medical Center- Providence Campus
T&T Recovery
The Polyclinic
The RE Store
The Westin Building
The Westin, Seattle
Todd Pacific Shipyards
Total Terminals International Inc. T-46
Touchstone
Trammell Crow Company
TRF Pacific Inc
Tyson Foods Inc
U S Army
U Village Imp Ltd Partnership
Unico Properties
Unico Properties, Inc
Union Pacific Railroad
United Indians of All Tribes Foundation

United States Dept Commerce
United States Postal Service
United States Postal Services
University (Greater) Chamber of Commerce
University Book Store Inc
University Heights Center
University Mazda
University of WA-Consolidated Laundry
University of WA-Physical Plant Bldg. Rm 104
University of Washington
University of Washington
University of Washington Educational Out- reach Program
University of Washington, Facilities Services
University Park Community Club
University Village IMP LTD Partnership
Urban League
US Army Corps of Engineers
US Coast Guard
US Geological Survey
UW School of Medicine
V A Medical Center
VA Puget Sound Health Care System
Veterans Affairs Puget Sound Health Care System
Vintage Park Hotel
Virginia Mason Medical Center
Vulcan Finance
Vulcan Inc.
Wallace Property Management
Wallingford Chamber of Commerce
Wallingford Community Senior Center
Wallingford Neighborhood Community Council
Walsh Construction
Wards Cove Packing Company
Wash Athletic Club
Wash Athletic Club
Washington Citizens for Resource Conservation
Washington Environmental Council
Washington Low Income Housing Alliance
Washington Organic Recycling Council
Washington Refuse & Recycling Assoc
Washington State Department of Transportation
Washington State Hispanic Chamber of Commerce (Seattle)
Washington State Recycling Association
Washington State Vietnamese American Chamber of Commerce
Washington Toxics Coalition
Washington Wildlife and Recreation Coalition
Waste Management
Waste Management - Eastmont

Waste Management Northwest
Water District #125
Waterfront Seafood Grill
Wedgwood Community Council
Wells Fargo Center
West Seattle Chamber of Commerce
West Seattle Junction Association
Western Towboat Company
Westin Building
Westin Building (Clise Properties)
Westlake Associates
Westlake Center Assn
Westwood Neighborhood Council
White Center Chamber of Commerce
White Center Community Development Association
Wild Fish Conservancy Northwest
Women Business Owners
Women's Business Exchange
Woodland Park Zoo
Woodworth and Co
Wright Runstad & Company
WUTC – as required by law
Yes-Presentation or Brochures
YMCA
Youngstown Cultural Arts Center
Youth in Focus
YWCA
Zero Waste Seattle
Zymogenetics Inc

PIP Appendix 5. Outreach Phone Script

The following phone script was used by the consultant team to contact stakeholders.

- Hi, is this ___?
- Hi, I'm ____ and I'm calling from The Connections Group on behalf of Seattle Public Utilities.
- We know things are busy over there, so I'll try to whiz through this: Right now SPU is updating Seattle's long-term solid waste plan and they're seeking consumer input on their proposed recommendations… from setting recycle goals to various initiatives to reduce waste.
- Since you are a respected organization in the _____ community, we'd love to get input from your organization to help represent the voice of ____.... Would you be willing to share your views with us? [on recommended changes to Waste Management in Seattle]
- Great! Could I get the best email address to reach you, and then… [*if no, ask if they'd be willing to fill out a five-minute survey then*]
- [*"What does it entail?"*] It's nothing big – all it involves is reading a document on the proposed recommendations, answering a few questions, and filling out a five-minute survey.
- Thanks! I'll send you the summary of proposed recommendations and the survey link this afternoon. Also, we're trying to reach out to individual communities as much as possible; would you be willing to put a blurb for the SPU survey on your Facebook or in your newsletter?
- And finally, we're hoping to get several ambassadors from each community. Do you have any suggestions on who else we could contact, or would you be willing to share our email with two employees/colleagues/board-members and ask if they'll fill it out too?
- [*If they are super interested*] We could check with SPU to see if we could get a presentation held at your next community meeting? Would that be something that interests you?
- Thanks for your help and participation!

PIP Appendix 6. Outreach Email

The following email was used by the consultant team to contact stakeholders after initial phone contacts.

Hi ___,

Great speaking with you earlier today and we appreciate your help in reaching out your community contacts for the SPU's long-term solid waste plan update.

At the end of this message, we've pasted the blurb for your blog.

Again, we're seeking to get three members from [org name] to give a voice in our outreach work, so if you could share this email with two colleagues who might be interested in these issues or would well represent the organization, that would be much appreciated.

Below are the instructions on giving your feedback. Your thoughts are going to help guide SPU for the next ten years! Thanks again for your time!

For the seventh straight year, Seattle's recycling rate has risen, hitting an all-time high of 53.7 percent overall and 70.3 percent for single households. The national recycling average is 32.1 percent. While each city calculates its diversion rates differently, Seattle is considered to be among the national leaders in municipal recycling, especially after the great strides we made in 2010.

Now Seattle Public Utilities (SPU) is looking for your input to inform our decision-making as we update our long-term waste plan. We'd like to know how you, your members, your business, or the people/businesses represented by your organization would be affected by the recommendations in the plan.

We ask that you read a section of the draft update and answer a few questions. The draft is available at www.seattle.gov/util/About_SPU/Garbage_System/Plans/Solid_Waste_Comprehensive_Plan/index.asp.

Feel free to choose the section that most interests you:

- The ***Executive Summary***, which gives an overview of the entire plan and summarizes all recommendations in the plan.
- ***A Breakdown of Recycling Recommendations***, attached as a Word Doc, which shows when these recommendations would be implemented in the different sectors of single-family homes, apartments and condos (multi-family), and business (commercial).
- Chapters that contains recommendations:
    - ***Chapter 3 Waste Prevention,*** which covers strategies to prevent waste from being created. It also talks about product stewardship, which gets producers and retailers more involved in managing their products at end of life.
    - ***Chapter 4 Seattle's MSW System***, which goes into more depth about the recycling recommendations. It also talks about the steps in waste management, from collection, through transfer, to processing and landfill disposal.

- ***Chapter 5 Other Solid Waste Streams***, which contains recommendations to increase construction and demolition debris, as well as for graffiti, illegal dumping, litter, and community cleanup.

- ***Chapter 6 Administration and Financing the Plan*** discusses solid waste education, as well as the financial impacts of the recycling recommendations.

After reading the section(s), please send a quick note to us at spusurvey@connectionsgroup.org [just reply to this email], specifying which section(s) you read and include any comments you have on the recommendations, the overall direction of the plan, the recycling goals, or anything else. We will make sure your comments are sent to SPU.

Here are a few sample questions to jumpstart your thinking.

1. Do you support the draft plan's recycling goals to reach 60% by 2015, and the longer-term goal of 70% by 2022? Do you think Seattle should be more aggressive about recycling, or increase recycling more slowly?

2. SPU's waste prevention programs include product stewardship activities, which seek increased producer responsibility for wastes. Do you agree producers and retailers should do more to reduce toxics in their products, and make their products more recyclable? Do you think they should pay for managing products at their end of life?

3. The recycling recommendations would be phased in over a number of years. Do you agree with the order and timing of the changes? Do you think customers will have time to get used to a change before the next one comes? Should the timing be more aggressive?

4. Do you support SPU inspectors increasing how much they look in garbage containers for materials that aren't allowed there?

5. Do you think the changes will go smoothly? Are there perhaps some problems SPU planners should take into account before starting a new program?

Lastly, it's also important you fill out a five-minute survey at the end when you have a moment.

https://www.surveymonkey.com/s/spusolidwasteplan

Thanks very much for your time and we appreciate your feedback.

BLURB

Have your voice heard as Seattle Public Utilities updates Seattle's long-term solid waste plan. SPU is looking for customer inputs on the draft plan which contains many recommendations. Read the plan at www.seattle.gov/util/About_SPU/Garbage_System/Plans/Solid_Waste_Comprehensive_Plan/index.asp.

Tell SPU what you think and take a five-minute survey at www.surveymonkey.com/s/spusolidwasteplan.

Let's make sure [your community] is well represented in SPU's outreach process!

PIP Appendix 7. Surveys

Online Survey

Seattle Public Utilities (SPU) requests customer input on plans to reduce waste and improve recycling, food and yard waste composting, and other solid waste services. This survey should take about 15 minutes. SPU will post a summary of the results on its website, www.seattle.gov/util/solidwasteplan.

Thank you for informing the decisions that will help SPU reach Seattle's goals to reduce waste, increase recycling, and keep future costs as low as possible.

***Which group best describes your point of view for this survey? (Choose one)**

- ◯ Seattle resident of a single-family home (detached, or up to 4 units)
- ◯ Seattle resident of a multi-family home (condo or apartment of 5 or more units)
- ◯ Manager of a multi-family residence in Seattle (of 5 units or more)
- ◯ Seattle business owner/manager
- ◯ Construction and demolition (C&D) professional serving Seattle
- ◯ Other (please specify)

What type of business do you own or manage? (Select from the drop-down menu)

If you selected other, please describe in box below

Which of these best describes your work as a construction and demolition (C&D) professional?

- ◯ Construction contractor
- ◯ Third party hauler or C&D waste and/or recycling collector
- ◯ C&D waste and/or recycling facility operator
- ◯ Other (please specify)

Page 1

***How often do you recycle the following materials at your job site?**

	Always	Very often	Sometimes	Rarely	Never	Don't know
Asphalt paving, bricks, and concrete	◯	◯	◯	◯	◯	◯
Metal	◯	◯	◯	◯	◯	◯
Cardboard	◯	◯	◯	◯	◯	◯
Plastic film wrap	◯	◯	◯	◯	◯	◯
Carpet	◯	◯	◯	◯	◯	◯
Clean wood	◯	◯	◯	◯	◯	◯
New gypsum scrap	◯	◯	◯	◯	◯	◯
Tear-off asphalt shingles	◯	◯	◯	◯	◯	◯

***For each material listed below, would you favor or oppose a plan to stop the material from disposal in the garbage that goes into the landfill?**

	Strongly favor	Favor	Oppose	Strongly oppose	Not sure/No opinion
Asphalt paving, bricks, and concrete	◯	◯	◯	◯	◯
Metal	◯	◯	◯	◯	◯
Cardboard	◯	◯	◯	◯	◯
Plastic film wrap	◯	◯	◯	◯	◯
Carpet	◯	◯	◯	◯	◯
Clean wood	◯	◯	◯	◯	◯
New gypsum scrap	◯	◯	◯	◯	◯
Tear-off asphalt shingles	◯	◯	◯	◯	◯

If you were required to sort materials for recycling at your job site and have them delivered to a recycling facility, do you think your costs would decrease, increase, or stay the same?

◯ Decrease

◯ Increase

◯ Stay the same

◯ Don't know/No opinion

Page 2

Seattle Public Utilities (SPU) is proposing to continue support for construction and demolition contractors to increase recycling. The support includes education about construction and demolition recycling options, expanding support for salvage activities, and developing a program that measures how well processing facilities are recycling. How important is it to you that SPU undertakes the following activities?

	1 - Not at all important	2	3	4	5	6	7 - Very important	Don't know/No opinion
Education about salvage	○	○	○	○	○	○	○	○
Education about deconstruction	○	○	○	○	○	○	○	○
Education about job site recycling	○	○	○	○	○	○	○	○
Education about recycling facilities	○	○	○	○	○	○	○	○
Checking and publishing facility recycling rates	○	○	○	○	○	○	○	○
Market development for recyclable materials	○	○	○	○	○	○	○	○

What is your home or business zip code for the home or business you're using as your point of view for this survey? (Enter 5-digit zip code)

ZIP: [ ]

How satisfied are you with Seattle Public Utilities' (SPU's) efforts to reduce waste and increase recycling and food and yard waste composting in Seattle?

1 - Not at all satified	2	3	4	5	6	7 - Very satisfied	Don't know
○	○	○	○	○	○	○	○

How satisfied are you with Seattle Public Utilities' garbage, recycling, and food and yard waste pickup services in Seattle?

1 - Not at all satified	2	3	4	5	6	7 - Very satisfied	Don't know
○	○	○	○	○	○	○	○

Page 3

***This question is about garbage service for single family households (up to 4-plexes).**

Right now the City's Seattle Public Utilities picks up garbage on a weekly basis. They also pick up food and yard waste every week. Now that food scraps are allowed in the weekly yard and food waste service, the City's Seattle Public Utilities is considering changing garbage to an every other week service. If this change is made, how satisfied would you be?

- ◯ Extremely satisfied
- ◯ Very satisfied
- ◯ Somewhat satisfied
- ◯ Not very satisfied
- ◯ Not at all satisfied
- ◯ Don't know/No opinion

What is the top reason you would be "somewhat satisfied," "not very satisfied," or "not at all satisfied" about changing garbage to an every other week service?
(Select from the drop-down menu)

If you selected other, please describe in box below

***Would you favor or oppose a plan that forbids food waste from being placed in the garbage container? Garbage containers with food and yard waste in them would not get picked up. Seattle already has similar rules about placing garbage in the recycling container and garbage in the food and yard waste container.**

◯ Strongly favor ◯ Favor ◯ Oppose ◯ Strongly oppose ◯ Not sure/No opinion

What is the top reason you would oppose a plan that forbids food waste from being placed in the garbage container?
(Select from the drop-down menu)

If you selected other, please describe in box below

Page 4

***Businesses are currently only required to recycle paper and cardboard. Would you favor or oppose a plan to require businesses to recycle more materials such as bottles and cans?**

◯ Strongly favor ◯ Favor ◯ Oppose ◯ Strongly oppose ◯ Not sure/No opinion

What is the top reason you would oppose a plan to require businesses to recycle more materials such as bottles and cans?
(Select from the drop-down menu)

If you selected other, please describe in box below

***Would you favor or oppose a plan to ask residents to put disposable diapers and pet waste into a separate collection container for pickup? The disposable diapers and pet waste would be composted using a process that kills bacteria and other pathogens.**

◯ Strongly favor ◯ Favor ◯ Oppose ◯ Strongly oppose ◯ Not sure/No opinion

What is the top reason you would oppose a plan to ask residents to put disposable diapers and pet waste into a separate collection container for pickup?
(Select from the drop-down menu)

If you selected other, please describe in box below

Page 5

Which of the following things would you be willing to do to help Seattle reduce waste, increase recycling and composting, and keep future costs as low as possible? (Select all that apply)

- [ ] Increase recycling at my business.
- [ ] Increase recycling where I shop and work.
- [ ] Increase my food waste composting.
- [ ] Increase my yard waste composting.
- [ ] Reduce the size of my garbage container.
- [ ] Separate disposable diapers and pet waste from my garbage.
- [ ] Pay a little more on my monthly bill so that Seattle residents and businesses can do more to reduce waste and protect the environment.
- [ ] Have my garbage collected every other week to keep future garbage, recycling, and food and yard waste composting costs lower.
- [ ] Nothing
- [ ] Other (please specify)

What other input would you like to provide to Seattle Public Utilities about waste reduction, recycling, and food and yard composting services in Seattle?

The following demographic questions are intended to measure how well Seattle Public Utilities provides equitable services. This information is completely anonymous and confidential. Your participation is voluntary.

Which of the following broad ranges includes your age?

- ( ) 18-34
- ( ) 35-54
- ( ) 55-64
- ( ) 65 or older
- ( ) Decline to answer

Page 6

What is your race? (Select all that apply)

- [ ] White
- [ ] Black or African American
- [ ] Chinese
- [ ] Filipino
- [ ] Vietnamese
- [ ] Don't know
- [ ] Decline to answer
- [ ] Other (please specify)

Are you of Hispanic, Latino, or Spanish Origin?

- ◯ Yes
- ◯ No
- ◯ Decline to answer

The following demographic questions are intended to measure how well Seattle Public Utilities provides equitable services. This information is completely anonymous and confidential. Your participation is voluntary.

What is the primary language spoken at your home?

- ◯ English
- ◯ Spanish
- ◯ Russian
- ◯ Vietnamese
- ◯ Chinese, Mandarin, Cantonese
- ◯ African Languages (such as Somali, Amharic, Oromo, Tamazight)
- ◯ Decline to answer
- ◯ Other (please specify)

Did you immigrate to the United States?

- ◯ Yes
- ◯ No
- ◯ Decline to Answer

Page 7

Including yourself what is your family/household size?

- ◯ 1
- ◯ 2
- ◯ 3
- ◯ 4
- ◯ 5 or over
- ◯ Decline to answer

The following demographic questions are intended to measure how well Seattle Public Utilities provides equitable services. This information is completely anonymous and confidential. Your participation is voluntary.

Please identify your annual household income.

- ◯ Under $30,000
- ◯ $30,000 – $39,000
- ◯ $40,000 – $49,000
- ◯ $50,000 - $59,000
- ◯ $60,000 to $75,000
- ◯ $75,000 – $100,000
- ◯ $100,000 and over
- ◯ Decline to answer

What is your gender?

- ◯ Male
- ◯ Female
- ◯ Decline to answer

What is the highest degree or level of school you have completed?

- ◯ Something less than high school graduate or GED
- ◯ High school graduate or GED
- ◯ Some college or technical school or AA degree
- ◯ 4 year college degree
- ◯ Post graduate work or degree

Those are all the questions we have for you today. Thank you very much. If you would like to ask a question or offer a comment about the Solid Waste Management Plan, please send an e-mail to SPU_SolidWastePlan@seattle.gov.

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Self Hauler Survey

Survey administration date _____ **Location (circle one)** **North** **South**

Name of survey administrator _____

1. **Are you here for business or personal use?**
   - o business (go to Q#1a)
   - o personal (go to Q#2)

   a. **If business, what kind of business** _____

2. **In what neighborhood is your home or business located?** _____
   (prompt with Seattle map of neighborhoods if needed)

The following recommendations from the City's solid waste management plan, could impact people who use this recycling and disposal station. Please rate the following with 1 being least supportive and 7 being most supportive of the recommendation.

3. **A carpet take-back program would allow people to return used carpet to the store where it was purchased or to some other drop-off site. On a scale of 1 to 7 how supportive are you of this recommendation with 1 for the lowest level of support and 7 for the highest level of support? (please circle)**

   1 **2** **3** **4** **5** **6** **7**

   Least supportive Most supportive

4. **A paint take-back program would allow people to return used paint to the store where it was purchased. On a scale of 1 to 7 how supportive are you of this recommendation with 1 for the lowest level of support and 7 for the highest level of support? (please circle)**

   1 **2** **3** **4** **5** **6** **7**

   Least supportive Most supportive

5. **When the new stations are ready, we want to ask loads that are more than half construction and demolition debris to unload on a separate area of the floor of the station. On a scale of 1 to 7 how supportive are you of this recommendation with 1 for the lowest level of support and 7 for the highest level of support? (please circle)**

   1 **2** **3** **4** **5** **6** **7**

   Least supportive Most supportive

6. **The next four questions are about banning recyclable construction and demolition materials from disposal in the station garbage pit.**

   a. **Asphalt paving wouldn't be allowed starting in 2013. On a scale of 1 to 7 how supportive are you of this recommendation with 1 for the lowest level of support and 7 for the highest level of support? (please circle)**

   1 **2** **3** **4** **5** **6** **7**

   Least supportive Most supportive

   b. **Asphalt roofing shingles wouldn't be allowed starting in 2014. On a scale of 1 to 7 how supportive are you of this recommendation with 1 for the lowest level of support and 7 for the highest level of support? (please circle)**

   1 **2** **3** **4** **5** **6** **7**

   Least supportive Most supportive

c. **Clean wood wouldn't be allowed starting in 2014. On a scale of 1 to 7 how supportive are you of this recommendation with 1 for the lowest level of support and 7 for the highest level of support? (please circle)**

1	2	3	4	5	6	7
Least supportive					Most supportive	

d. **Plastic film also wouldn't be allowed starting in 2014. On a scale of 1 to 7 how supportive are you of this recommendation with 1 for the lowest level of support and 7 for the highest level of support? (please circle)**

1	2	3	4	5	6	7
Least supportive					Most supportive	

7. **The new stations will have separate recycling drop-off areas. You would be able to unload recyclable materials before crossing the scale - eliminating the need for those with recycling only to wait in line. On a scale of 1 to 7 how supportive are you of this recommendation with 1 for the lowest level of support and 7 for the highest level of support? (please circle)**

1	2	3	4	5	6	7
Least supportive					Most supportive	

9. **Age**
- o 18-34
- o 35-54
- o 55-64
- o 65 or older

10. **Ethnicity/Race**
- o Asian
- o American Indian or Alaskan Native
- o Black or African American
- o Pacific Islander or Native Hawaiian
- o White/Causasian
- o Don't know
- o Decline to answer
- o Other (please specify) _____

11. **Are you of Hispanic, Latino or Spanish heritage?**
- o Yes
- o No

12. **Language Spoken at Home**
- o English
- o Chinese
- o Spanish
- o Tagalog
- o Decline to answer
- o Other (please specify) _____

Thank you so much for your input. It will help guide our efforts to reduce waste, increase recycling, and improve solid waste services. [*Offer the respondent a pair of work gloves (size medium or large).*]

Self Hauler Survey in Spanish

Fecha de realización de la encuesta _____ **Ubicación (elija una)** **Norte** **Sur**

Nombre del realizador de la encuesta _____

1. **¿Está usted aquí por negocios o por razones personales?**
   - negocios (vaya a la P#1a)
   - razones personales (vaya a la P#2)

   a. **Si es por negocios, qué clase de negocios** _____

2. **¿En cuál Codigo zip está ubicado su negocio o sudomicilio?** _____
   (si desea, utilice el mapa de las urbanizaciones de Seattle)

Las siguientes recomendaciones del plan de manejo de desechos sólidos de la Ciudad podrían tener un impacto en las personas que utilizan esta estación de reciclaje y disposición. Por favor, puntue cada una de las siguientes preguntas siendo 1 el menor nivel de respaldo y 7 el mayor nivel de respaldo que usted da a estas recomendaciones.

3. **Un programa para devolver alfombras permitiría a las personas regresar las alfombras usadas a la tienda en donde las compraron o a algún otro lugar de descarga. En una escala de 1 a 7 qué tanto apoya usted esta recomendación, siendo 1 el nivel más bajo de apoyo y 7 el mayor nivel de apoyo? (por favor, haga un círculo alrededor)**

   1 2 3 4 5 6 7

   Menor apoyo Mayor apoyo

4. **Un programa para devolver pinturas permitiría a las personas regresar las pinturas usadas a la tienda en donde las compraron. En una escala de 1 a 7 qué tanto apoya usted esta recomendación, siendo 1 el nivel más bajo de apoyo y 7 el mayor nivel de apoyo? (por favor, haga un círculo alrededor)**

   1 2 3 4 5 6 7

   Menor apoyo Mayor apoyo

5. **Cuando las nuevas estaciones estén listas, queremos pedir que las cargas que tengan más de la mitad en escombros de construcción y demoliciones se descarguen en áreas diferentes del piso de la estación. En una escala de 1 a 7 qué tanto apoya usted esta recomendación, siendo 1 el nivel más bajo de apoyo y 7 el mayor nivel de apoyo? (por favor, haga un círculo alrededor)**

   1 2 3 4 5 6 7

   Menor apoyo Mayor apoyo

6. **En las siguientes cuatro preguntas se habla de prohibir la eliminación de materiales reciclables de demolición y construcción en la fosa de basura de la estación.**
   a. **No se permitirá el pavimento de asfalto a partir del año 2013. En una escala de 1 a 7 qué tanto apoya usted esta recomendación, siendo 1 el nivel más bajo de apoyo y 7 el mayor nivel de apoyo? (por favor, haga un círculo alrededor)**

   1 2 3 4 5 6 7

   Menor apoyo Mayor apoyo

   b. **No se permitirán las tablillas de asfalto para techos a partir del año 2014. En una escala de 1 a 7 qué tanto apoya usted esta recomendación, siendo 1 el nivel más bajo de apoyo y 7 el mayor nivel de apoyo? (por favor, haga un círculo alrededor)**

   1 2 3 4 5 6 7

   Menor apoyo Mayor apoyo

c. **No se permitirá la madera no tratada a partir del año 2014. En una escala de 1 a 7 qué tanto apoya usted esta recomendación, siendo 1 el nivel más bajo de apoyo y 7 el mayor nivel de apoyo? (por favor, haga un círculo alrededor)**

1	2	3	4	5	6	7
Menor apoyo					Mayor apoyo	

d. **No se permitirán las películas de plástico a partir del año 2014. En una escala de 1 a 7 qué tanto apoya usted esta recomendación, siendo 1 el nivel más bajo de apoyo y 7 el mayor nivel de apoyo? (por favor, haga un círculo alrededor)**

1	2	3	4	5	6	7
Menor apoyo					Mayor apoyo	

7. **Las nuevas estaciones tendrán áreas de descarga separadas para el reciclaje. Usted podrá descargar materiales reciclables antes de pasar por la pesa – lo que eliminará la necesidad de hacer fila para las personas que van sólo a reciclar. En una escala de 1 a 7 qué tanto apoya usted esta recomendación, siendo 1 el nivel más bajo de apoyo y 7 el mayor nivel de apoyo? (por favor, haga un círculo alrededor)**

1	2	3	4	5	6	7
Menor apoyo					Mayor apoyo	

9. **Edad**
- o 18-34
- o 35-54
- o 55-64
- o 65 o más

10. **Raza / Grupo étnico**
- o Asiático
- o Amerindio o nativo de Alaska
- o Negro o africano estadounidense
- o Isleño del Pacífico o nativo hawaiano
- o Blanco / Caucásico
- o No sé
- o No quiero responder
- o Otro (por favor, especifique) _____

11. **¿Es usted hispano, latino o de ascendencia española?**
- o Sí
- o No

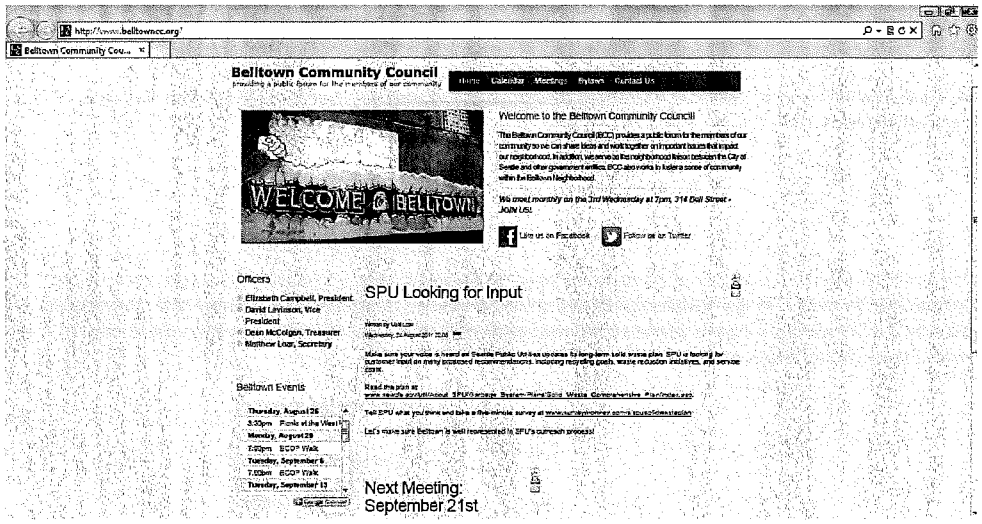
12. **Idioma que habla en casa**
- o Inglés
- o Chino
- o Español
- o Tagalo
- o No quiero responder
- o Otro (por favor, especifique) _____

Muchas gracias por sus respuestas. Nos ayudará en nuestros esfnerzos por reducir los desechos, aumentar el reciclaje, y mejorar los servicios de manejo de desechos sólidos. [*Se entregará al participante un par de guantes de trabajo (talla mediana o grande)].*

PIP Appendix 8. Web and Social Media/Networking Activities

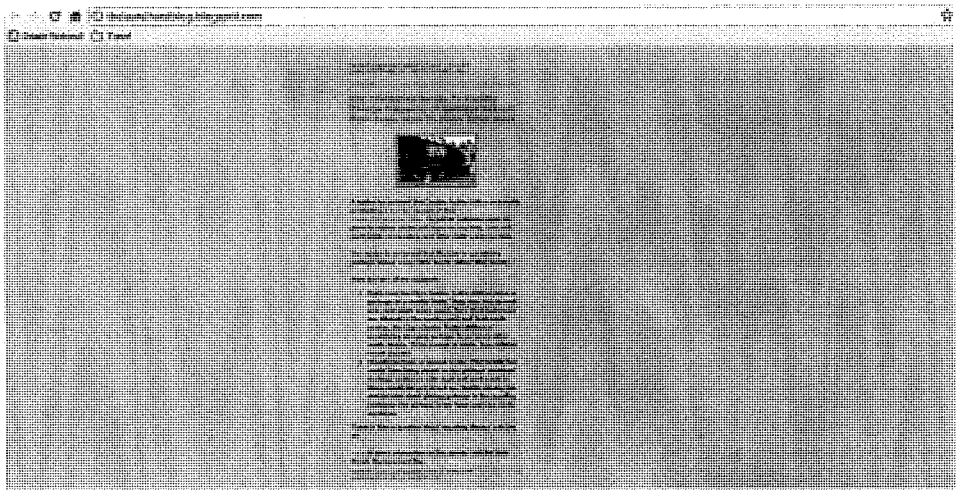
(Website, blog and Facebook postings of the draft of the Seattle Solid Waste Plan and survey link)

Belltown Community Council Blog

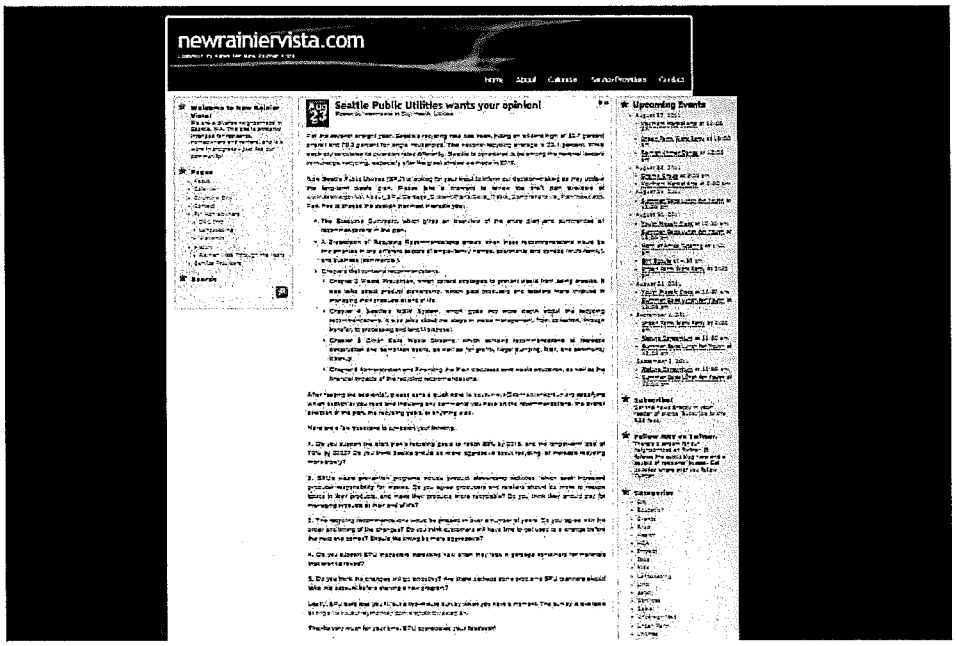


Broadview Neighborhood Blog

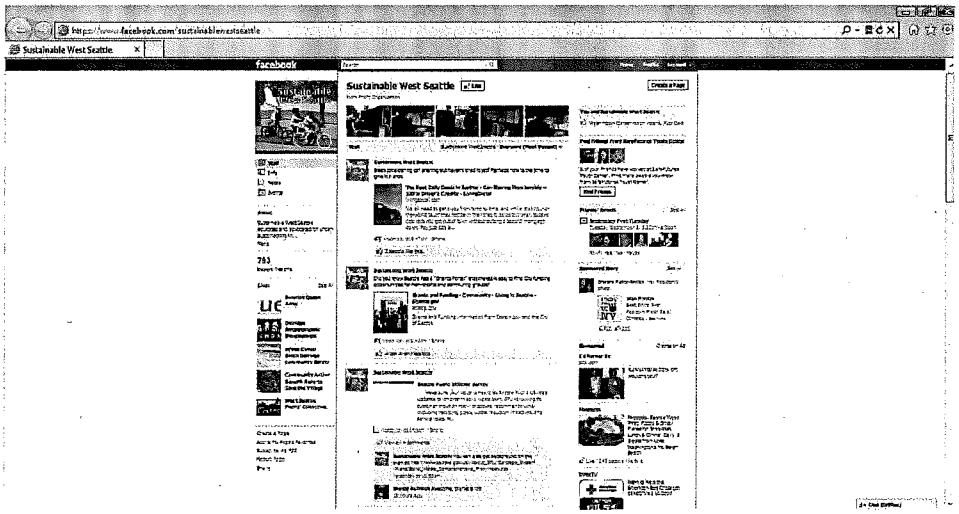
Laurelhurst Neighborhood Blog

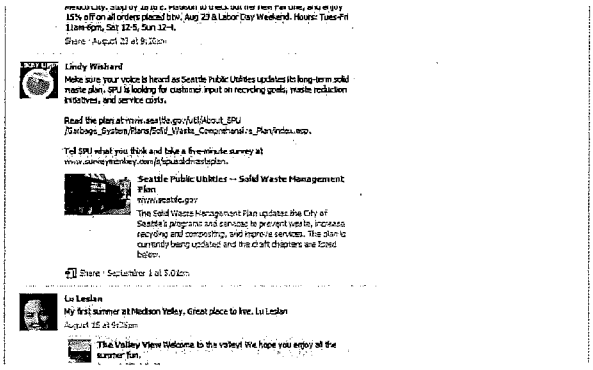


New Rainiervista Blog



Sustainable West Seattle Blog and Facebook Posting





Appendix D

Recycling Potential Assessment Model and Environmental Benefits Analysis

Economic Analysis of New Waste Prevention and Recycling Programs

Jeffrey Morris, Ph.D., Economist, Sound Resource Management Group
Jennifer Bagby, Ph.D., Principal Economist, Seattle Public Utilities

This paper briefly describes two economic models used to produce the recommended new waste prevention and recycling programs in Seattle's 2011 Solid Waste Plan. The first is the Recycling Potential Assessment (RPA) Model which is a model that forecasts tonnages and financial costs and benefits. The second is Measuring the Environmental Benefits Calculator (MEBCalc™) model used to calculate the environmental benefits from the same set of programs.

Recycling Potential Assessment (RPA) Model Summary

Seattle Public Utilities uses the Recycling Potential Assessment (RPA) Model to

- forecast waste generation
- calculate estimates of tonnages that can be diverted from landfill due to recycling, waste reduction and composting
- provide financial cost and benefit estimates for each of the scenarios analyzed in the model

The purpose of this section is to give a summary of the design of the RPA and how it works.

Model Definitions

The RPA model actually consists of two separate RPA models: one for the municipal solid waste (MSW) stream and one for the construction and demolition debris (C&D) waste stream. The MSW and C&D RPA models are structured very similarly, so this overview is written generally to apply to both models. There is a slight difference between the two models, since in C&D we have beneficial uses as well as recycling. The differences will be pointed out as the models are described.

The waste streams are defined, not so much by the materials that are included in them but in the method and location of disposal. Waste collected from within Seattle, and taken to transfer stations and transferred into containers for transportation to the MSW landfill in Arlington, Oregon, is considered MSW waste (or "garbage"). The waste collected separately under the C&D collection contract--destined for disposal in a C&D landfill--is considered C&D waste.

On the other hand, recycling tonnages are credited to either the C&D sector or the MSW sector depending on the recycled material. For example, any recycled wood waste is counted towards the C&D recycling rate. Plastic film is counted towards the MSW recycling rate, even though plastic film occurs in both the C&D and MSW waste streams. The material accounting is handled in this fashion because, in a lot of cases, the recycling reports SPU uses to track recycled materials are not specific enough for us to tell where the material ***would have been*** disposed (in a C&D vs MSW landfill) had it not been recycled.

Four Modules

Four main modules comprise the RPA model: Waste Generation, Recycling Tonnages, Cost Module and Reporting Module.

Waste Generation Module

The first step in the RPA model is to forecast the amount of waste generation in Seattle, broken down into three sectors for the MSW model (Residential Single Family and Multi-Family, Commercial and Self Haul). The C&D model just has one overall sector. The forecast estimate equations use econometric techniques and include a variety of economic, demographic, price and weather variables.

Each forecasted waste stream is then further broken down into 20 material types, based on the waste stream composition data Seattle regularly collects. The model forecasts waste generation, by sector by material, out 30 years.

Recycling Tonnages Module

The next step is the recycling module, which contains data about existing programs and assumptions about new programs.

Existing recycling and composting programs are modeled based on how much they are currently diverting (the existing recovery rate). Detailed recycling data is collected on a regular basis for programs such as the Seattle's curbside recycling program (which is implemented under a contract with Seattle). Daily "truck level" data is available for total tons collected for each program, and periodic recycling composition data is used to separate the tons collected into the material detail. For other programs, such as most of the commercial recycling (which is collected privately), tons recycled come from an annual report all recyclers in Seattle are required to submit as part of their business license renewal. These reports have annual tons collected by material.

New recycling programs are modeled using judgment as to the ultimate recovery rate a program is projected to achieve, and the "ramp" (or path) the program follows from the time is starts until it reaches a steady recovery rate. The model is set up to run "scenarios," which are groups of programs that are assembled according to some overall themes or scenario descriptions. A base

scenario typically models existing recycling programs (without any new programs). Other scenarios then layer on top of the base existing programs.

For each new program, parameters are developed that include what sector and material the program will address, the year the program starts and the new program's ramp. When a new program is included in a scenario that targets the same material that an existing program does, the new program has available to it what remains after the existing program is attributed its tonnages. For example, we have a curbside organics program that diverts food waste, and if we then want to model a program that makes the food waste mandatory, the tons attributed to the new mandatory program are the additional tons diverted after the existing program tons are calculated.

Financial Costs and Benefits Module

The next step in the model is to calculate program costs and financial benefits. The calculations use the factors in the waste generation and recycling tonnages modules just described.

For **program costs**, each program can be modeled using a variety or types of costs. The intention is to model program costs at a detailed enough level so that as program recovery rates are varied, costs will vary in a meaningful way. Programs can have fixed and/or variable cost components. The variable components can vary by household, employee, or tons. Programs can also have capital costs, and the life of the capital can be set to reflect what makes sense for that program's capital types. Examples of typical program costs are: costs of collection, bin or cart cost, education, and processing costs.

The **financial benefits** of recycling include costs we do not have to incur—which is the cost to have recyclable material handled as garbage and disposed in a landfill. When we recycle, tons of material are diverted from garbage and no longer need collecting, transferring, hauling to the rail head, and landfilling. There are savings at each step of the way and these savings are the direct financial benefits to recycling. These are often described as "avoided costs".

In order to calculate these benefits, the model needs to have, as inputs, the variable part of the cost to collect, transfer, transport and dispose of the MSW or C&D. Not all of the costs of collecting a ton of garbage are saved when the ton is diverted to recycling. Only the part of the costs that vary with tons is saved. For example, the variable part of the residential collection cost is calculated based on SPU's collector contracts. Contractors are reimbursed for collection based on a formula that has fixed and variable components. When tonnages vary, we can estimate the effect on the contractor payment using the formula in the collection contract. (The formulas in the contract were developed to try to reflect the reality of how collection costs are accrued. There are large fixed costs associated with collection, including the trucks and the costs to weekly drive by each household, for example. The variable portion of the costs is small for collection since the truck must pass by the household each week, regardless of the amount of waste that is put out for disposal.)

Similarly, we have transfer station and haul cost models which we use to determine the variable portion of these two functions. Finally, disposal costs are considered to be 100% variable with tons. This is because for MSW we have a long-term contract where we pay a per-ton fee for rail haul and disposal, and the fee does not depend on how many tons are delivered.

The cost model uses the above information in the calculation of the financial benefits of recycling. (A second group of benefits, the environmental benefits of recycling, are handled outside of the RPA model and will be described in the next section.) The result of the cost model is the additional costs of adding the recycling program (which include education, collection, any capital costs, processing, etc), and the benefits (or avoided costs) of not having to collect the material for disposal in a landfill.

Reporting Module

The final module in the RPA model is simply used to develop reports so detailed results of each model run can be presented as needed. Results reported include displaying the tons recycled by year by material and by program. Reports also show the recovery rate for each material by sector, and an overall recycling rate. The C&D model shows a second rate, that we call the "beneficial use" rate. This rate includes tons that are diverted from disposal to be used for energy production or landfill cover. The report tables following this write-up are examples of the reports generated by the reporting module.

Environmental Benefits to Recycling

Beginning with the 2004 Plan Amendment "On the Path to Sustainability" SPU has been estimating a series of external benefits to recycling. This section describes the steps used to model these external benefits. We start by introducing some background on the methodology, followed by more detail on how environmental benefits are quantified. The results of applying the methodology are shown in the 2 charts placed at the end.

Introduction

Handling and disposal of waste causes external environmental costs and benefits. Externalities are impacts on the environment that are not "counted" in the price (cost) of the activity.

For example, using recycled instead of virgin feedstock to manufacture paper, aluminum cans or tin cans creates measureable environmental benefits. Many of these benefits are from reduced energy use in the production process and associated avoided emissions. There are also measureable benefits of diverting organics from landfills. Landfilled organics produce methane, a powerful greenhouse gas. We have been working over the past couple of years to be able to both quantify and monetize these benefits.

There has been extensive research in the area of quantifying these external benefits over the past 25 years. An important early research initiative was a seminal study done by the Tellus Institute (Tellus Institute, The Council of State Governments, US EPA, and New Jersey Department of Environmental Protection and Energy, *CSG/Tellus Packaging Study: Assessing the impacts of production and disposal of packaging and public policy measures to alter its mix*, May 1992). This study examined both the upstream effects of using recycled material versus virgin material in the production of new products. It also looked at the downstream effects of additional trucks on the streets, and reduced materials at landfills.

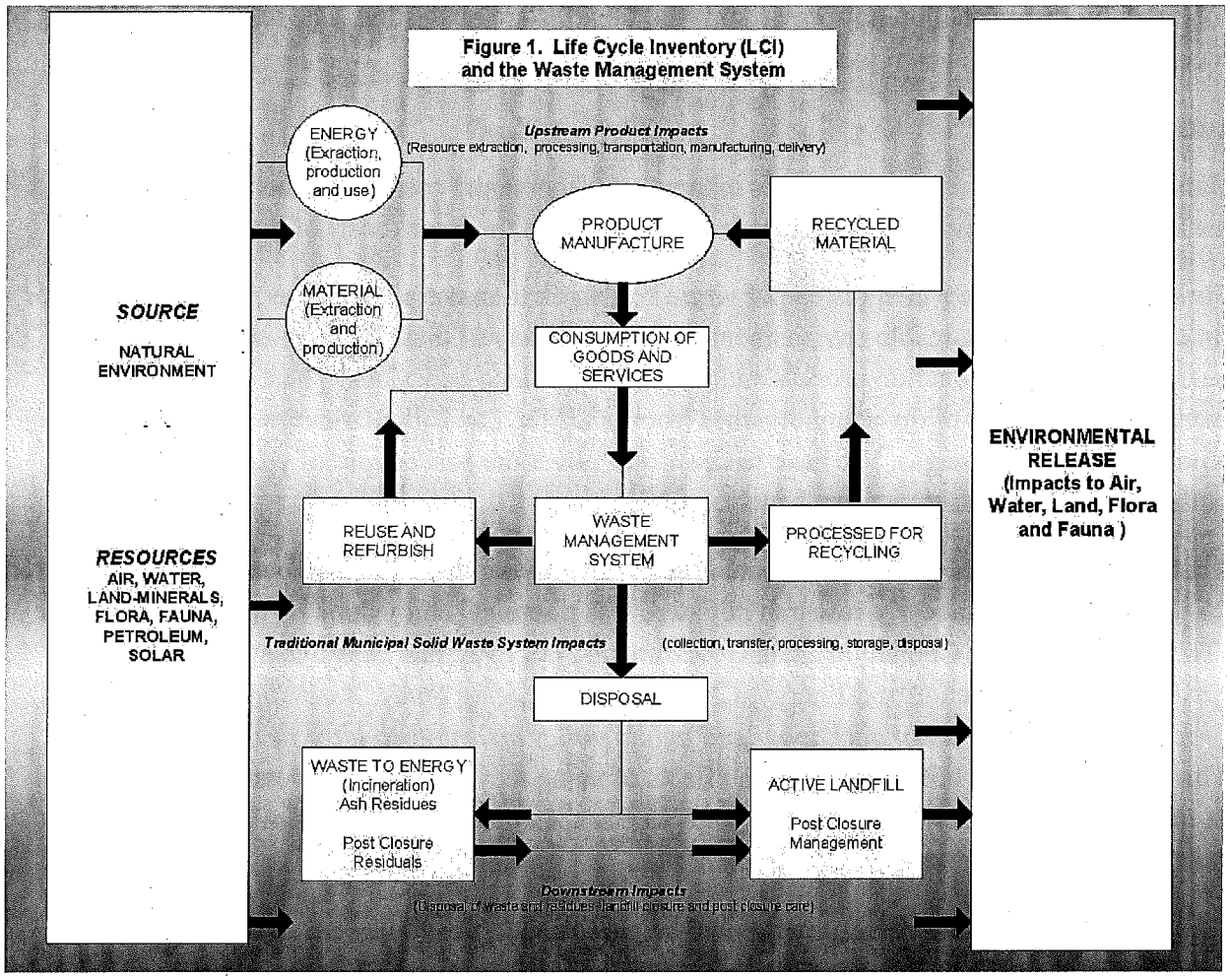
The US EPA has extensive information on their website on this topic (e.g., see http://www.epa.gov/osw/conserve/rrr/recycle.htm). EPA also funded the development of a solid waste planning tool, the MSW Decision Support Tool (DST), which optimizes on cost, recycling percentage or levels of pollution (see http://www.epa.gov/osw/nonhaz/municipal/pubs/ghg/f02024.pdf).

SPU has used the DST tool, and upstream effects information provided in the database that supports the tool, to examine the externalized costs of some of its recycling programs.

SPU now uses the MEBCalc™ tool to estimate and quantify the environmental value of recycling programs. This tool takes into account the environmental costs of collection, processing and hauling activities needed for recycling. These environmental costs are deducted

from the environmental benefits of producing products using recycled rather than virgin feedstocks.

The following graphic illustrates material flow and the types of externalities associated with the life cycle of materials.



How External Benefits Are Quantified and Monetized

Going from the tons of a variety of recycled materials to a dollar value of the environmental benefit involves a series of steps. First, recycled/composted tons, by material, are taken from the outputs of the RPA Model. Then a variety of tools and databases (described below) provide information on quantities of pollutants that are not produced when material is recycled or composted instead of being thrown away.

For example, manufacturing a new aluminum can using a recycled can uses less energy--which results in the release of fewer pollutants due to the lower energy requirement. Less pollution

means lower public health and other environmental impacts from producing the aluminum can. Based on the costs that pollution causes for public health and the environment, we then can calculate the cost savings from making the aluminum can out of a recycled can rather than newly mined bauxite and other virgin raw materials.

Large numbers of pollutants are reduced for each of the life cycle environmental impacts (described below) for all of the recycled and composted materials. This is handled by using one pollutant as an index for each of these impacts. The most familiar example is CO2 used as the index for global warming. If methane is one of the pollutants reduced due to recycling or composting, this is expressed in units of C02. All the other pollutants that contribute to global warming are also expressed in units of CO2, and this allows them to be added together. Hence the term CO2 equivalents. The next step is then to place a value on (i.e., monetize) the reduction in CO2. This step of monetization allows all the life cycle impacts to be summarized in dollars, and added onto the financial costs and benefits of recycling calculated in the RPA model.

The current status of the art of quantifying external environmental benefits provides monetary values on at least 7 different types of environmental impacts. This allows us to represent some of the upstream savings when material is recycled instead of disposed. The next section describes the 7 damages (impacts) we have valued, followed by a discussion of other impact categories and benefits not quantified.

Life Cycle Impact Categories: Short Description & Estimates of Impact Cost

The following descriptions of the 7 impact categories, or indices, are based on Jane Bare, TRACI 2.0: the tool for the reduction and assessment of chemical and other environmental impacts 2.0, *Clean Technologies and Environmental Policy,* 2011 13(5) 687-696. This article provides additional detail on environmental impact categories. The 7 impact categories include

1. ***Global warming potential***
2. ***Acidification potential***
3. ***Eutrophication potential***
4. ***Respiratory Human Health Impact Potential***
5. ***Non-Cancer Human Health Impact Potential***
6. ***Cancer Human Health Impact Potential***
7. ***Ecological toxicity potential***

1. Global Warming Potential

This index characterizes greenhouse effect increase due to emissions generated by humankind. Life Cycle Analyses (LCAs) often use a 100-year time horizon to frame the global warming potential of greenhouse gases. For example, carbon dioxide (CO2) from burning fossil fuels to generate energy is the most common source of greenhouse gases. Methane from anaerobic

decomposition of organic material is another large source of greenhouse gases. The index often used for global warming potential from greenhouse gas releases is quantities of CO2 equivalents.

Estimates of the dollar cost of a ton of greenhouse gases, measured as CO2 equivalents, range quite widely. At the low end, an estimate could be based on prices for emissions permits traded under voluntary greenhouse gas emission limitation agreements, which hover around $1 per ton CO2. A high-end estimate could be based on the $85 per metric ton cost developed in Nicholas Stern, *The Economics of Climate Change: The Stern Review.* Cambridge and New York: Cambridge University Press, 2007. There are even higher estimates for the cost of carbon emissions. However, for this evaluation we used $40 per ton of CO2 emissions.

2. Acidification Potential

This index characterizes the release of acidifying compounds from human sources, principally fossil fuel and biomass combustion, which affect trees, soil, buildings, animals and humans. The main pollutants involved in acidification are sulfur, nitrogen and hydrogen compounds – e.g., sulfur oxides, sulfuric acid, nitrogen oxides, hydrochloric acid, and ammonia.

There are economic benefits of recycling due to reductions in the releases of acidifying compounds. These reductions are due to decreased reliance on virgin materials in manufacturing products. is The index often used for acidification potential is sulfur dioxide (SO2) equivalents.

One impact cost estimate (of releases of acidifying compounds) is provided by the spot market price for SO2 emissions permit trading under the Clean Air Act's cap and trade program. EPA's spot market auctions for emissions permits for the years 2005 through 2010 averaged $410 per ton SO2. We used this valuation for reductions in releases of acidifying compounds.

3. Eutrophication Potential

This index characterizes the addition of mineral nutrients to soil or water. In both media, adding large quantities of mineral nutrients (such as nitrogen and phosphorous) results in generally undesirable shifts in the number of species in ecosystems, that is, a reduction in ecological diversity. In water, it tends to increase algae growth, which can lead to low oxygen, causing death of species such as fish.

There are economic benefits of recycling associated with the resulting reductions in releases of nutrifying compounds. This decreased release is due to decreased reliance on virgin materials in manufacturing products. For eutrophication potential, the index often used is quantities of nitrogen (N) equivalents.

Our estimate of the impact cost of releases of nutrifying compounds is based on EPA's cost-effectiveness analysis for the NPDES regulation on effluent discharges from concentrated animal feeding operations. That analysis estimated that costs up to $4 per ton of nitrogen removed from wastewater effluents were economically advantageous. (*Economic Analysis of the Final Revisions to the National Pollutant Discharge Elimination System Regulation and the Effluent*

Guidelines for Concentrated Animal Feeding Operations, EPA-812-R-03-002, December 2002, p. E-9.)

4. Respiratory Human Health Impact Potential

Criteria air pollutants are solid and liquid particles commonly found in the air. These include coarse particles known to aggravate respiratory conditions such as asthma, and fine particles that can lead to more serious respiratory symptoms and disease. The particular criteria air pollutants that cause these human health effects are nitrogen oxides, sulfur oxides, and particulates.

We denominated this impact category in PM2.5 equivalents (particulate matter no larger than 2.5 microns). A mid-range estimate of the human health costs of PM2.5 emissions is $10,000 per ton, as discussed in Eastern Research Group, *Draft Report: Cost Benefit Analysis for Six "Pure" Methods for Managing Leftover Latex Paint - Data, Assumptions and Methods,* prepared for the Paint Product Stewardship Initiative, 2006.

5. Non-Cancer Human Health Impact Potential:

Under the Life Cycle Initiative of the United Nations Environment Program (UNEP)/Society of Environmental Toxicology and Chemistry (SETAC), various international multimedia model developers created a global consensus model—USEtox—to address an expanded list of substances which might have impacts on human health cancers and non-cancers, as well as on ecotoxicity. The USEtox model adopted many of the best features of these developers' models, and yielded human health cancer and non-cancer toxicity potentials, and freshwater ecotoxicity potentials, for over 3,000 substances including organic and inorganic substances. EPA uses these potentials in its TRACI 2.0 software (*Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts*).

The economic benefits of recycling include reductions in releases of compounds toxic to humans. These toxic reductions are due to decreased reliance on virgin materials in manufacturing products. Tons of toluene is used as the human toxicity potential index.

As discussed in Jeffrey Morris and Jennifer Bagby, Measuring Environmental Value for Natural Lawn and Garden Care Practices. *International Journal of Life Cycle Assessment,* 2008, 13(3) 226-234, a mid-range estimate of $118 per ton of toluene equivalents is a reasonable estimate to monetize non-cancer human health impacts caused by substances such as mercury, toluene and acrolein.

6. Cancer Human Health Impact Potential:

A mid-range estimate of $3,030 per ton of benzene equivalent releases to air is used to monetize cancer human health impacts caused by emissions of substances such as formaldehyde, benzene and mercury.

7. Ecological Toxicity Potential:

EPA, in its TRACI 2.0 software, also provides toxicity equivalency potentials that measure the relative potential for harm to terrestrial and aquatic ecosystems from chemicals released into the environment. The estimated cost to ecosystems of chemical releases is $3,280 per ton of 2,4-D herbicide equivalents released to waterways, as discussed in Morris and Bagby (2008). This may be a very conservative cost estimate based on the citation by Eastern Research Group (2006) of remediation costs for 2,4-D removal of $368,000 per ton.

Impact Categories Not Yet Quantified, Material Types Not Yet Evaluated, And Externalized Costs Underestimated

Currently, economic benefits estimates for SPU recycling programs do not include any benefit estimates for several materials such as gypsum wallboard, household batteries, carpet and paint. LCA research is currently underway so that these materials can be included in future calculations of recycling's environmental benefits.

Environmental impact and resource depletion impacts include the following categories that are not presently included in our quantification of benefits. This is due to the absence of emissions data for the specific pollutants tracked under some of these categories, the lack of quantitative measures to relate emissions to impacts, and/or the absence of well-researched monetization estimates:

1. Fossil Fuel Depletion Potential
2. Habitat Alteration Potential
3. Smog Formation Potential
4. Ozone depletion Potential
5. Indoor Air Quality
6. Water Intake

Estimates of damage costs may underestimate the actual costs, to future generations, of current releases of pollutants and depletion of resources. This seems a particularly acute problem for ecosystem impacts, given our currently limited understanding of long run impacts from

- accelerated species extinctions and decreases in biodiversity, and
- associated decreases in various aspects of ecosystems' ability to, among other things, cycle nutrients, clean our air and clean our water.

Future costs from cumulative impacts of global warming are also difficult to predict.

Finally, estimates of human health costs from toxic and carcinogenic releases do not presently appear to account adequately for impacts (cumulative and interactive) of many of the chemical releases to the environment. There may be as many as 75,000 to 100,000 chemical compounds used in industrial processes and commerce.

To put this into perspective, our seven impact categories quantify releases to air and water for less than a thousand substances. The MSW Decision Support Tool (DST) developed under sponsorship of EPA provides full life cycle quantification for releases of just ten air pollutants and seventeen water pollutants. The DST database provides upstream quantification of releases for recycled-versus virgin-content manufacturing (including the extraction and refining stages) for a number of other substances. But even there, the number of tracked substances totals well under 100.

Other Benefits Not Quantified: Existence Value of Recycling

Waste disposal reduction (which lowers the need for landfills), and the conservation of limited resources, are two public goods provided by recycling programs. Within the context of present market mechanisms, the economic value of these public goods is unlikely to be reflected in market prices--and therefore likely to escape benefit-cost assessments of recycling. Consumers who choose to participate in recycling programs may not see the public good benefits from their own recycling (since their contribution is relatively small compared to the total); however, they do obtain benefits from everybody else's recycling efforts. This is a type of non-use (sometimes called existence) value of recycling programs. Likewise, consumers who choose not to participate in recycling programs also enjoy the benefits of these public goods.

Analysis Results for Seattle's Solid Waste Plan Waste Reduction and Recycling Recommendations

The following two charts illustrate the magnitude of the additional benefits from recycling MSW and C&D materials, for both past years and planned future recycling through 2030. These benefits are calculated by first starting with the tons recycled/composted from the RPA model for the recommended scenarios. Then using the techniques described above and embodied in MEBCalc™, the benefits are quantified across the life cycle impact categories using an indexed pollutant for each category. Then a monetary value is placed on each of the indexed pollutants to allow these different life cycle impact categories to be expressed in dollar terms so they can be added together.

For MSW, Chart 1 shows estimated environmental benefits for actual recycling from 1997 through 2010. For C&D, Chart 2 shows estimated environmental benefits for actual C&D material recycling for 2007 through 2010.Reductions in climate change and human health impacts account for most of the environmental value of MSW recycling. This is a result of diverting materials from disposal to recycling. Most of the environmental value for C&D recycling comes from reductions in human health and ecosystem toxicity impacts, as a result of diverting C&D materials from disposal. For the years 2007 through 2010, and a few years following 2010, reductions in climate change impacts also provide a substantial portion of the environmental benefits for C&D recycling.

Chart 1 Environmental Value ($millions) of Recycled MSW Tons. 1997-2030

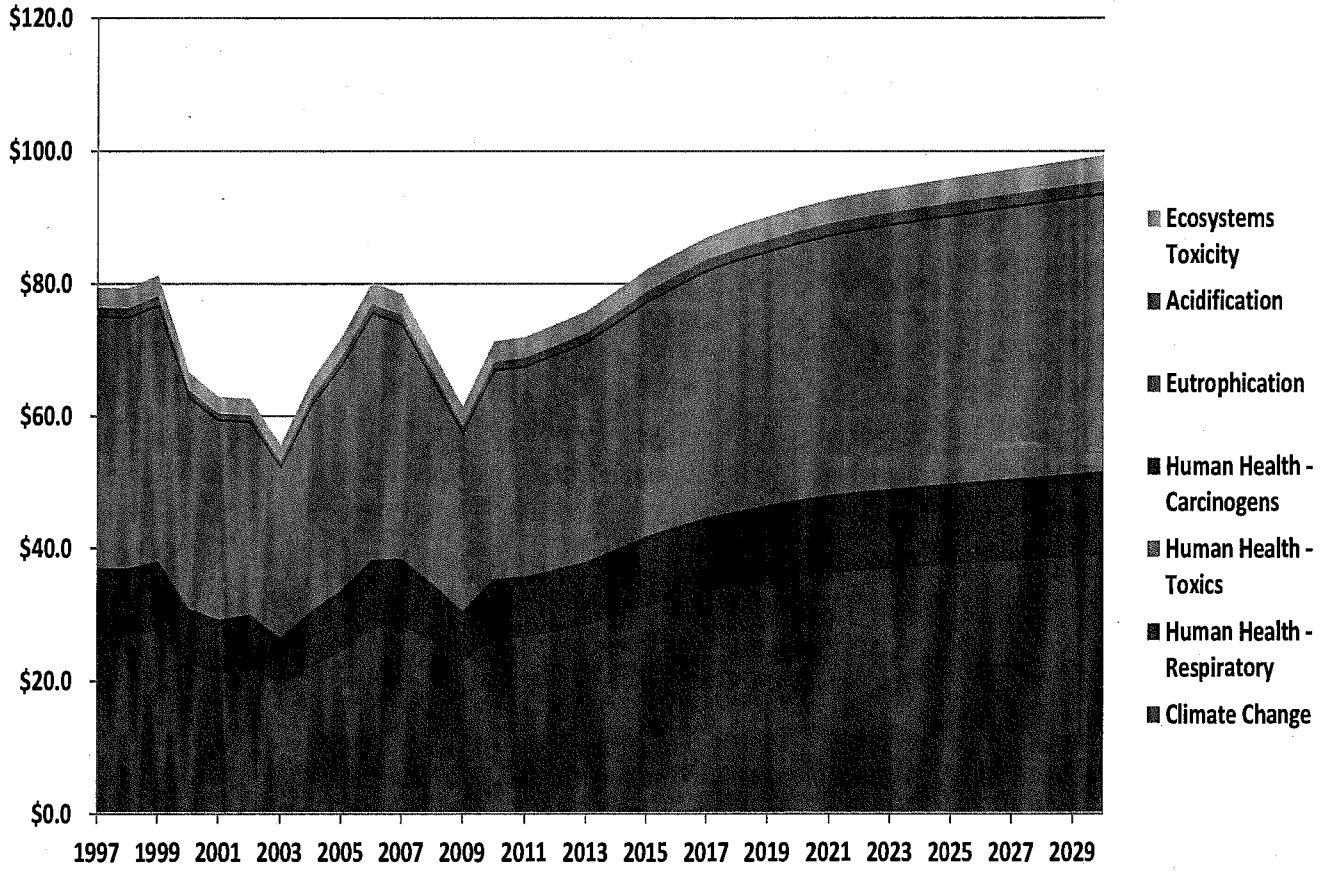


Table 1 Environmental Value ($millions) of Recycled MSW Tons*

Year	Climate Change	Human Health - Respiratory	Human Health - Toxics	Human Health - Carcinogens	Eutrophication	Acidification	Ecosystems Toxicity	Total Environmental Value
2010	26.4	9.0	31.3	0.3	0.0	1.2	3.0	71.5
2020	35.7	11.6	38.7	0.4	0.0	1.7	3.4	92.9
2030	39.0	12.6	41.7	0.4	0.0	1.9	3.8	101.0

*Monetized Value of Specific Environmental Impacts Reductions

Chart 2 Environmental Value ($millions) of Recycled C&D Tons, 2007-2030

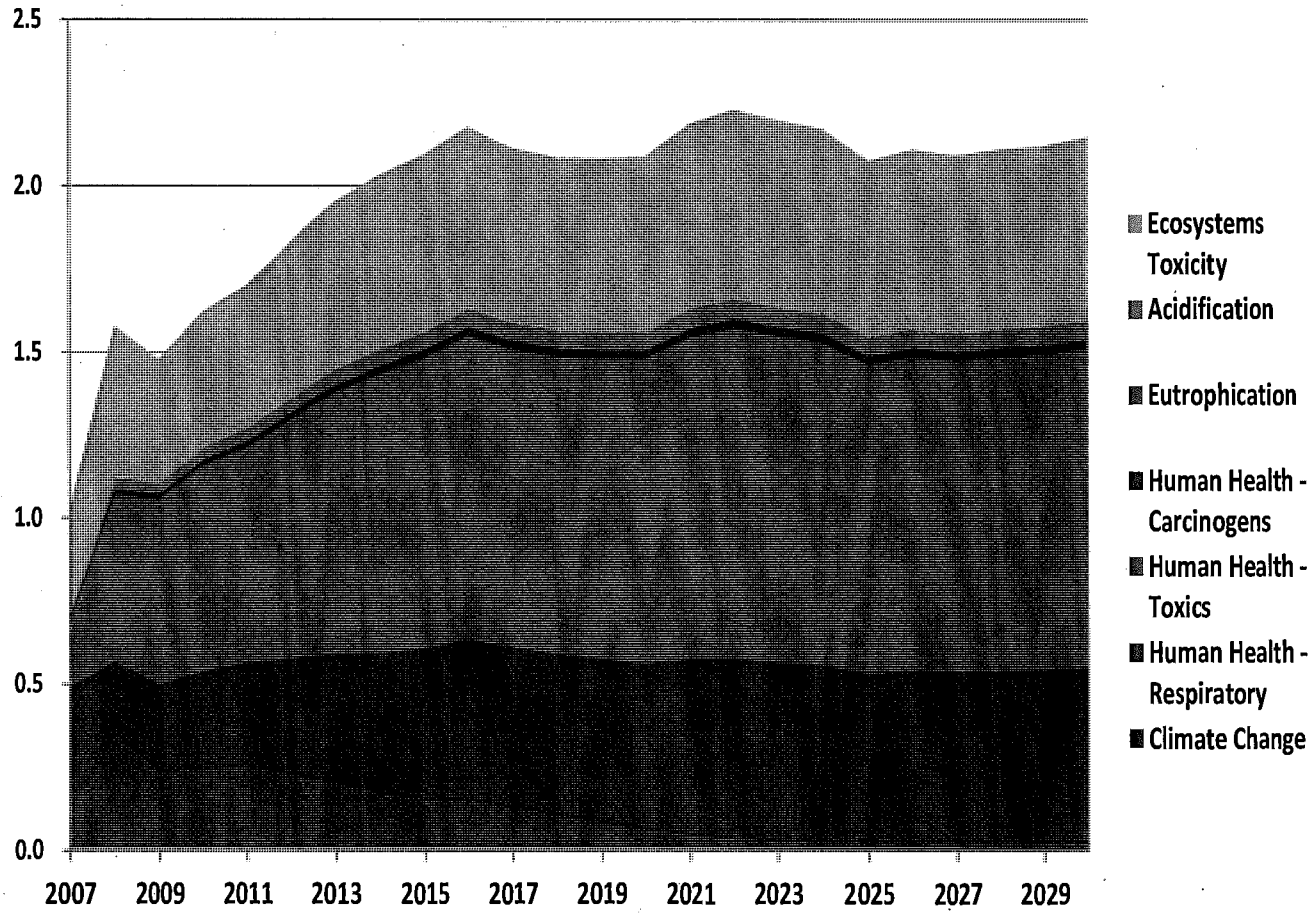


Table 2 Environmental Value ($millions) of Recycled C&D tons*

Year	Climate Change	Human Health - Respiratory	Human Health - Toxics	Human Health - Carcinogens	Eutrophication	Acidification	Ecosystems Toxicity	Total Environmental Value
2010	0.243	0.295	0.615	0.016	0.000	0.043	0.410	1.623
2020	0.060	0.500	0.918	0.024	0.000	0.062	0.526	2.090
2030	0.023	0.525	0.963	0.025	0.000	0.064	0.550	2.150

*Monetized Value of Specific Environmental Impacts Reductions

,mmary - Program Tons Per Ye
Scenario 1, Status Quo

				Order ->	*2*	*3*	*4*	*5*
Year	Recycle Rate	Total Material	Total Diposed	Total Recycled	Curb/Apt Rec	BY YW In City	BY FW In City	Grasscycl e
		-	-	-	2	3	4	5
1997	44.4%	816,174	453,787	362,386	67,509	6,779	16,470	5,119
1998	44.2%	820,212	457,598	362,613	70,279	6,680	15,887	6,038
1999	44.0%	852,299	477,433	374,866	73,478	4,002	15,590	10,660
2000	40.0%	793,825	476,131	317,693	72,864	4,002	873	10,660
2001	39.3%	782,894	475,270	307,623	72,382	4,002	873	10,660
2002	39.7%	768,422	462,996	305,426	72,543	4,002	873	10,660
2003	38.2%	741,656	458,010	283,646	73,780	4,002	873	10,660
2004	41.2%	780,061	458,405	321,656	76,860	4,800	2,400	9,900
2005	44.2%	789,740	440,876	348,864	81,139	4,600	2,100	9,600
2006	47.6%	836,373	438,380	397,993	84,531	4,600	2,100	9,600
2007	48.3%	848,125	438,845	409,280	86,621	4,600	2,100	9,600
2008	50.0%	789,607	394,607	395,000	81,888	4,600	2,100	9,600
2009	51.1%	719,423	351,688	367,735	76,584	2,600	1,100	7,100
2010	50.9%	780,664	383,438	397,226	78,554	2,655	1,123	7,251
2011	51.2%	783,186	382,112	401,074	78,487	2,640	1,117	7,211
2012	52.1%	789,299	378,194	411,105	78,592	2,628	1,112	7,176
2013	52.9%	791,832	372,560	419,271	78,614	2,612	1,105	7,134
2014	53.6%	794,323	368,427	425,896	78,534	2,597	1,099	7,092
2015	54.0%	795,698	366,081	429,617	78,380	2,582	1,093	7,053
2016	54.2%	798,068	365,894	432,174	78,427	2,575	1,090	7,034
2017	54.3%	802,464	367,094	435,370	79,225	2,596	1,098	7,091
2018	54.2%	804,837	368,556	436,282	79,100	2,583	1,093	7,055
2019	54.1%	807,071	370,133	436,938	78,880	2,568	1,087	7,015
2020	54.1%	810,694	372,307	438,387	78,753	2,556	1,082	6,983
2021	54.0%	816,837	375,451	441,386	79,374	2,568	1,087	7,017
2022	54.0%	822,953	378,636	444,317	79,999	2,581	1,092	7,051
2023	53.9%	829,180	381,876	447,305	80,671	2,595	1,098	7,089
2024	53.9%	835,530	385,174	450,355	81,363	2,609	1,104	7,127
2025	53.9%	842,027	388,547	453,480	82,074	2,624	1,110	7,168
2026	53.8%	848,581	391,952	456,628	82,782	2,638	1,116	7,207
2027	53.8%	855,143	395,363	459,780	83,494	2,652	1,122	7,246
2028	53.7%	861,830	398,800	463,030	84,236	2,667	1,129	7,287
2029	53.7%	868,628	402,275	466,353	85,004	2,683	1,135	7,330
2030	53.6%	875,647	405,864	469,783	85,825	2,700	1,143	7,377

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Summary - Program Tons Per Year
Scenario 1, Status Quo

Year	6	7	9	10	11	12	13	14	15
	BY YW Not City	BY FW Not City	Curb/Apt Org	Clean Green	Drop Sites	Com Priv Rec	Foodware Rec/Comp	ABC Ban	MF Univer Org Serv
	6	7	8	21	23	30	35	22	13
1997	7,400	2,520	43,130	14,137	5,000	194,323	-	-	-
1998	7,700	2,823	40,546	13,034	5,376	194,251	-	-	-
1999	8,000	3,127	39,737	13,692	6,612	199,968	-	-	-
2000	8,000	3,127	34,037	14,032	7,109	162,989	-	-	-
2001	8,000	3,127	36,990	15,034	7,103	149,453	-	-	-
2002	8,000	3,127	34,503	14,353	8,340	149,025	-	-	-
2003	8,000	3,127	33,923	14,156	8,170	126,956	-	-	-
2004	5,000	1,800	38,485	14,907	8,163	159,341	-	-	-
2005	4,800	1,600	42,603	13,925	9,232	179,265	-	-	-
2006	4,800	1,600	51,482	14,277	9,745	215,258	-	-	-
2007	4,800	1,600	54,573	14,247	11,246	219,894	-	-	-
2008	4,800	1,600	56,364	11,893	8,662	213,493	-	-	-
2009	3,500	1,700	74,230	10,149	6,179	184,593	-	-	-
2010	3,575	1,736	76,624	11,351	6,907	205,610	1,840	-	-
2011	3,554	1,726	77,214	11,571	7,033	206,360	4,161	-	-
2012	3,538	1,718	78,462	11,925	7,229	208,209	7,793	1,075	1,647
2013	3,517	1,708	79,800	12,190	7,341	208,764	11,418	2,044	3,024
2014	3,496	1,698	80,962	12,414	7,373	209,507	13,795	3,043	4,285
2015	3,477	1,688	82,021	12,583	7,312	209,874	14,941	3,716	4,896
2016	3,468	1,684	83,062	12,742	7,241	210,326	15,427	4,070	5,027
2017	3,496	1,697	84,518	12,824	7,182	210,741	15,628	4,223	5,051
2018	3,478	1,688	84,526	12,992	7,223	211,433	15,737	4,327	5,046
2019	3,459	1,679	84,252	13,145	7,287	212,301	15,818	4,397	5,052
2020	3,443	1,671	83,989	13,295	7,362	213,756	15,967	4,454	5,077
2021	3,460	1,679	84,488	13,443	7,441	215,111	16,055	4,507	5,156
2022	3,476	1,687	84,974	13,602	7,528	216,391	16,137	4,561	5,238
2023	3,495	1,696	85,501	13,761	7,615	217,631	16,214	4,614	5,324
2024	3,514	1,706	86,043	13,921	7,704	218,891	16,293	4,668	5,414
2025	3,534	1,715	86,601	14,081	7,792	220,181	16,373	4,722	5,505
2026	3,553	1,725	87,150	14,241	7,881	221,505	16,456	4,776	5,598
2027	3,572	1,734	87,699	14,400	7,969	222,829	16,541	4,829	5,692
2028	3,593	1,744	88,276	14,554	8,054	224,191	16,631	4,880	5,789
2029	3,614	1,754	88,874	14,705	8,137	225,576	16,722	4,931	5,888
2030	3,637	1,765	89,524	14,861	8,224	226,940	16,811	4,984	5,993

Summa Program Sector Materials Diversion b ogram
Status Quo Year 2025 All MSW Sectors

(in tons per year)

Material MSW	.	Total Disposed 1	Total Recycled 2	Total Generated 3	Percent Recycled (2/3)	Curb/Apt Rec 2	BY YW In City 3	BY FW In City 4	Grasscycl e 5
Aluminum Beverage	BALU	1,178	1,854	3,033	61.1%	965	-	-	-
Beverage Glass	BGLS	4,519	18,537	23,056	80.4%	15,229	-	-	-
Construction Debris	CDEB	25,993	4,722	30,715	15.4%	-	-	-	-
Container Glass	CGLS	632	2,981	3,613	82.5%	2,981	-	-	-
Computer Office Paper	CPO	11,811	16,023	27,834	57.6%	-	-	-	-
Food Cans	FFER	1,695	1,857	3,552	52.3%	1,082	-	-	-
Food	FOOD	54,324	81,510	135,834	60.0%	-	-	1,110	-
Miscellaneous	MISC	48,392	30,397	78,789	38.6%	-	-	-	-
Mixed Scrap Paper	MWP	16,428	53,718	70,147	76.6%	28,044	-	-	-
Newspaper	NP	8,963	40,095	49,058	81.7%	15,792	-	-	-
Other Paper	NRP	22,930	12,860	35,790	35.9%	-	-	-	-
Other Aluminum	OALU	1,164	-	1,164	0.0%	-	-	-	-
Corrugated Kraft	OCC	18,757	66,462	85,219	78.0%	13,453	-	-	-
Other Ferrous	OFER	12,527	12,620	25,147	50.2%	630	-	-	-
Other Glass	OGLS	5,140	971	6,110	15.9%	-	-	-	-
Other NonFerrous	ONFR	216	-	216	0.0%	-	-	-	-
Other Organics	OORG	39,766	-	39,766	0.0%	-	-	-	-
Plastics	PLST	49,331	9,087	58,419	15.6%	3,899	-	-	-
Wood	WOOD	54,044	245	54,289	0.5%	-	-	-	-
Yard	YARD	10,736	99,540	110,276	90.3%	-	2,624	-	7,168
Total	**Grand Tc**	**388,547**	**453,480**	**842,027**	**53.9%**	**82,074**	**2,624**	**1,110**	**7,168**

Year	Total Disposed 1	Total Recycled 2	Total Generated 3	Percent Recycled (2/3)
1997	453,787	362,386	816,174	44.4%
1998	457,598	362,613	820,212	44.2%
1999	477,433	374,866	852,299	44.0%
2000	476,131	317,693	793,825	40.0%
2001	475,270	307,623	782,894	39.3%
2002	462,996	305,426	768,422	39.7%
2003	458,010	283,646	741,656	38.2%
2004	458,405	321,656	780,061	41.2%
2005	440,876	348,864	789,740	44.2%
2006	438,380	397,993	836,373	47.6%
2007	438,845	409,280	848,125	48.3%
2008	394,607	395,000	789,607	50.0%
2009	351,688	367,735	719,423	51.1%
2010	383,438	397,226	780,664	50.9%
2011	382,112	401,074	783,186	51.2%
2012	378,194	411,105	789,299	52.1%
2013	372,560	419,271	791,832	52.9%
2014	368,427	425,896	794,323	53.6%
2015	366,081	429,617	795,698	54.0%
2016	365,894	432,174	798,068	54.2%
2017	367,094	435,370	802,464	54.3%
2018	368,556	436,282	804,837	54.2%
2019	370,133	436,938	807,071	54.1%
2020	372,307	438,387	810,694	54.1%
2021	375,451	441,386	816,837	54.0%
2022	378,636	444,317	822,953	54.0%
2023	381,876	447,305	829,180	53.9%
2024	385,174	450,355	835,530	53.9%
2025	388,547	453,480	842,027	53.9%
2026	391,952	456,628	848,581	53.8%
2027	395,363	459,780	855,143	53.8%
2028	398,800	463,030	861,830	53.7%
2029	402,275	466,353	868,628	53.7%
2030	405,864	469,783	875,647	53.6%

Summ - Program Sector Materials Diversion b rogram

Status Quo Year 2025 All MSW Sectors

Material MSW		BY YW Not City 6	BY FW Not City 7	Curb/Apt Org 8	MF Univer Org Serv 13	Clean Green 21	ABC Ban 22	Drop Sites 23	Com Priv Rec 30	Foodware Rec/Comp 35
Aluminum Beverage	BALU	-	-	-	-	-	-	4	885	-
Beverage Glass	BGLS	-	-	-	-	-	-	537	2,771	-
Construction Debris	CDEB	-	-	-	-	-	4,722	-	-	-
Container Glass	CGLS	-	-	-	-	-	-	-	-	-
Computer Office Paper	CPO	-	-	-	-	-	-	-	16,023	-
Food Cans	FFER	-	-	-	-	-	-	-	775	-
Food	FOOD	-	1,715	31,632	4,499	-	-	-	35,055	7,498
Miscellaneous	MISC	-	-	-	-	-	-	63	30,334	-
Mixed Scrap Paper	MWP	-	-	-	-	-	-	477	25,197	-
Newspaper	NP	-	-	-	-	-	-	385	23,919	-
Other Paper	NRP	-	-	3,735	1,006	-	-	-	-	8,119
Other Aluminum	OALU	-	-	-	-	-	-	-	-	-
Corrugated Kraft	OCC	-	-	-	-	-	-	1,006	52,004	-
Other Ferrous	OFER	-	-	-	-	-	-	5,048	6,942	-
Other Glass	OGLS	-	-	-	-	-	-	-	971	-
Other NonFerrous	ONFR	-	-	-	-	-	-	-	-	-
Other Organics	OORG	-	-	-	-	-	-	-	-	-
Plastics	PLST	-	-	-	-	-	-	27	4,407	755
Wood	WOOD	-	-	-	-	-	-	245	-	-
Yard	YARD	3,534	-	51,235	-	14,081	-	-	20,899	-
Total	**Grand Tc**	**3,534**	**1,715**	**86,601**	**5,505**	**14,081**	**4,722**	**7,792**	**220,181**	**16,373**

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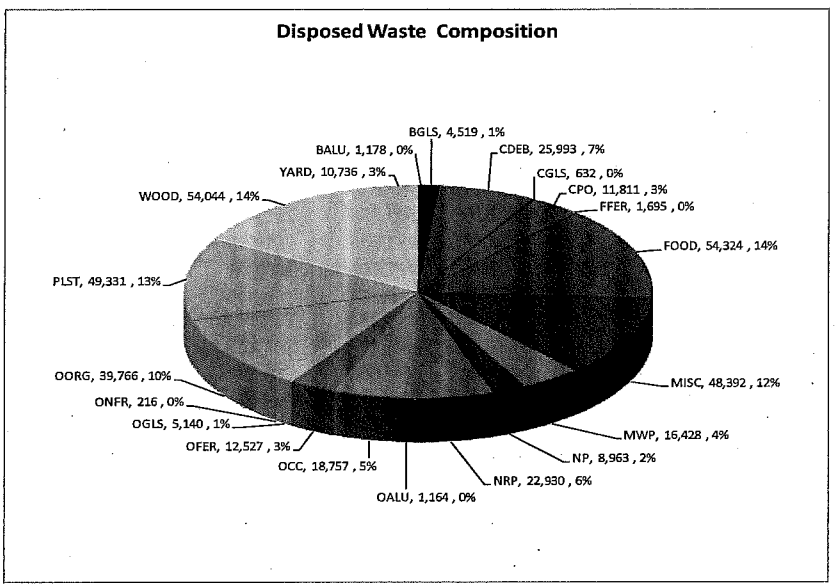

Summa Program Sector Materials Diversion k rogram

Status Quo Year 2025 Single Family Sector

(in tons per year)

Material MSW	Row Lab	Total Disposed 1	Total Recycled 2	Total Generated 3	Percent Recycled (2/3)	Curb/Apt Rec 2	BY YW In City 3	BY FW In City 4
Aluminum Beverage	BALU	206	742	948	78.2%	742	-	-
Beverage Glass	BGLS	764	10,575	11,339	93.3%	10,575	-	-
Construction Debris	CDEB	815	-	815	0.0%	-	-	-
Container Glass	CGLS	250	2,070	2,319	89.2%	2,070	-	-
Computer Office Paper	CPO	653	-	653	0.0%	-	-	-
Food Cans	FFER	437	835	1,272	65.7%	835	-	-
Food	FOOD	12,249	30,291	42,540	71.2%	-	-	1,110
Miscellaneous	MISC	3,252	-	3,252	0.0%	-	-	-
Mixed Scrap Paper	MWP	3,475	21,030	24,505	85.8%	21,030	-	-
Newspaper	NP	466	11,923	12,388	96.2%	11,923	-	-
Other Paper	NRP	6,591	2,825	9,416	30.0%	-	-	-
Other Aluminum	OALU	348	-	348	0.0%	-	-	-
Corrugated Kraft	OCC	821	8,790	9,611	91.5%	8,790	-	-
Other Ferrous	OFER	617	390	1,006	38.7%	390	-	-
Other Glass	OGLS	151	-	151	0.0%	-	-	-
Other NonFerrous	ONFR	3	-	3	0.0%	-	-	-
Other Organics	OORG	20,822	-	20,822	0.0%	-	-	-
Plastics	PLST	7,711	2,970	10,681	27.8%	2,970	-	-
Wood	WOOD	923	-	923	0.0%	-	-	-
Yard	YARD	922	63,067	63,989	98.6%	-	2,624	-
Total	**Grand Tc**	**61,474**	**155,508**	**216,982**	**71.7%**	**59,325**	**2,624**	**1,110**

Year	Total Disposed 1	Total Recycled 2	Total Generated 3	Percent Recycled (2/3)
1997	88,783	137,555	226,337	60.8%
1998	87,560	137,686	225,247	61.1%
1999	88,631	141,956	230,586	61.6%
2000	87,499	120,969	208,468	58.0%
2001	91,072	120,910	211,982	57.0%
2002	87,834	118,640	206,474	57.5%
2003	87,426	118,322	205,748	57.5%
2004	86,029	123,103	209,132	58.9%
2005	80,479	128,197	208,676	61.4%
2006	78,078	138,810	216,889	64.0%
2007	77,494	142,634	220,127	64.8%
2008	73,961	139,928	213,889	65.4%
2009	67,229	147,786	215,015	68.7%
2010	67,893	151,706	219,599	69.1%
2011	66,550	151,809	218,360	69.5%
2012	64,757	152,556	217,314	70.2%
2013	62,911	153,124	216,035	70.9%
2014	61,597	153,167	214,764	71.3%
2015	60,803	152,762	213,565	71.5%
2016	60,449	152,520	212,970	71.6%
2017	60,858	153,802	214,661	71.6%
2018	60,529	153,063	213,592	71.7%
2019	60,172	152,194	212,366	71.7%
2020	59,893	151,501	211,394	71.7%
2021	60,184	152,241	212,424	71.7%
2022	60,474	152,977	213,451	71.7%
2023	60,796	153,794	214,590	71.7%
2024	61,130	154,637	215,766	71.7%
2025	61,474	155,508	216,982	71.7%
2026	61,811	156,360	218,171	71.7%
2027	62,147	157,210	219,357	71.7%
2028	62,501	158,105	220,606	71.7%
2029	62,869	159,037	221,906	71.7%
2030	63,272	160,056	223,328	71.7%

Summa Program Sector Materials Diversion Program

Status Quo Year 2025 Single Family Sector

Material MSW		Grasscycle	BY YW Not City	BY FW Not City	Curb/Apt Org
	Row Lab	5	6	7	8
Aluminum Beverage	BALU	-	-	-	-
Beverage Glass	BGLS	-	-	-	-
Construction Debris	CDEB	-	-	-	-
Container Glass	CGLS	-	-	-	-
Computer Office Paper	CPO	-	-	-	-
Food Cans	FFER	-	-	-	-
Food	FOOD	-	-	1,715	27,466
Miscellaneous	MISC	-	-	-	-
Mixed Scrap Paper	MWP	-	-	-	-
Newspaper	NP	-	-	-	-
Other Paper	NRP	-	-	-	2,825
Other Aluminum	OALU	-	-	-	-
Corrugated Kraft	OCC	-	-	-	-
Other Ferrous	OFER	-	-	-	-
Other Glass	OGLS	-	-	-	-
Other NonFerrous	ONFR	-	-	-	-
Other Organics	OORG	-	-	-	-
Plastics	PLST	-	-	-	-
Wood	WOOD	-	-	-	-
Yard	YARD	7,168	3,534	-	49,743
Total	**Grand Tc**	**7,168**	**3,534**	**1,715**	**80,033**

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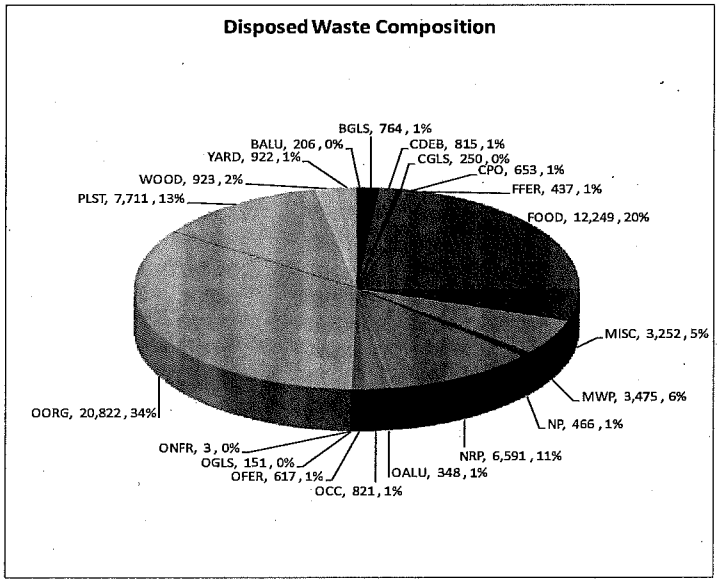

Summa Program Sector Materials Diversion I)rogram

Status Quo Year 2025 Multi Family Sector

(in tons per year)

Material MSW		Total Disposed	Total Recycled	Total Generated	Percent Recycled	Curb/Apt Rec	Curb/Apt Org
	Row Lal	1	2	3	(2/3)	2	8
Aluminum Beverage	BALU	167	224	391	57.2%	224	-
Beverage Glass	BGLS	1,037	4,655	5,692	81.8%	4,655	-
Construction Debris	CDEB	1,965	-	1,965	0.0%	-	-
Container Glass	CGLS	150	911	1,061	85.8%	911	-
Computer Office Paper	CPO	465	-	465	0.0%	-	-
Food Cans	FFER	368	246	615	40.1%	246	-
Food	FOOD	7,999	8,665	16,664	52.0%	-	4,166
Miscellaneous	MISC	4,062	-	4,062	0.0%	-	-
Mixed Scrap Paper	MWP	3,641	7,014	10,655	65.8%	7,014	-
Newspaper	NP	587	3,869	4,456	86.8%	3,869	-
Other Paper	NRP	4,583	1,916	6,499	29.5%	-	910
Other Aluminum	OALU	158	-	158	0.0%	-	-
Corrugated Kraft	OCC	1,480	4,662	6,143	75.9%	4,662	-
Other Ferrous	OFER	1,504	240	1,744	13.8%	240	-
Other Glass	OGLS	247	-	247	0.0%	-	-
Other NonFerrous	ONFR	41	-	41	0.0%	-	-
Other Organics	OORG	10,994	-	10,994	0.0%	-	-
Plastics	PLST	5,617	928	6,545	14.2%	928	-
Wood	WOOD	2,972	-	2,972	0.0%	-	-
Yard	YARD	1,492	1,492	2,985	50.0%	-	1,492
Total	**Grand T**	**49,530**	**34,823**	**84,353**	**41.3%**	**22,750**	**6,568**

Year	Total Disposed	Total Recycled	Total Generated	Percent Recycled
	1	2	3	(2/3)
1997	59,189	11,371	70,560	16.1%
1998	58,374	12,266	70,640	17.4%
1999	59,087	12,639	71,726	17.6%
2000	58,333	12,595	70,927	17.8%
2001	53,487	15,124	68,611	22.0%
2002	55,076	15,068	70,144	21.5%
2003	56,106	16,043	72,149	22.2%
2004	56,498	16,142	72,640	22.2%
2005	54,080	18,245	72,325	25.2%
2006	55,643	19,903	75,545	26.3%
2007	55,759	21,261	77,020	27.6%
2008	53,199	21,024	74,223	28.3%
2009	51,497	19,028	70,524	27.0%
2010	52,955	19,813	72,767	27.2%
2011	52,950	20,140	73,090	27.6%
2012	51,153	22,317	73,469	30.4%
2013	49,370	24,391	73,761	33.1%
2014	47,450	26,596	74,046	35.9%
2015	45,919	28,429	74,347	38.2%
2016	45,138	29,846	74,985	39.8%
2017	45,205	30,969	76,174	40.7%
2018	45,267	31,506	76,773	41.0%
2019	45,397	31,796	77,193	41.2%
2020	45,653	32,052	77,705	41.2%
2021	46,375	32,588	78,963	41.3%
2022	47,118	33,121	80,238	41.3%
2023	47,900	33,675	81,575	41.3%
2024	48,704	34,242	82,946	41.3%
2025	49,530	34,823	84,353	41.3%
2026	50,363	35,409	85,771	41.3%
2027	51,207	36,002	87,209	41.3%
2028	52,079	36,615	88,695	41.3%
2029	52,977	37,247	90,223	41.3%
2030	53,918	37,908	91,826	41.3%

Summa Program Sector Materials Diversion Program

Status Quo Year 2025 Multi Family Sector

Material MSW	Row Lal	MF Univer Org Serv
		13
Aluminum Beverage	BALU	-
Beverage Glass	BGLS	-
Construction Debris	CDEB	-
Container Glass	CGLS	-
Computer Office Paper	CPO	-
Food Cans	FFER	-
Food	FOOD	4,499
Miscellaneous	MISC	-
Mixed Scrap Paper	MWP	-
Newspaper	NP	-
Other Paper	NRP	1,006
Other Aluminum	OALU	-
Corrugated Kraft	OCC	-
Other Ferrous	OFER	-
Other Glass	OGLS	-
Other NonFerrous	ONFR	-
Other Organics	OORG	-
Plastics	PLST	-
Wood	WOOD	-
Yard	YARD	-
Total	**Grand T**	**5,505**

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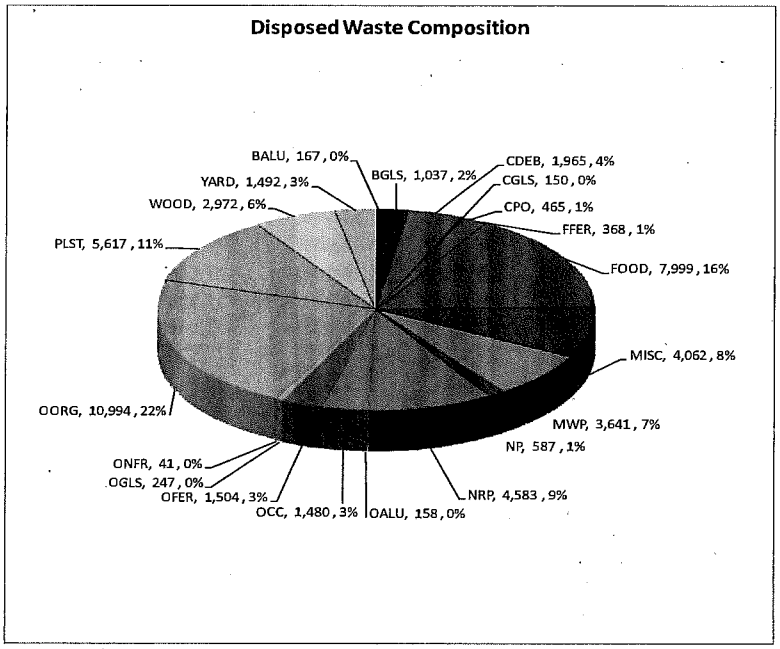

Summa Program Sector Materials Diversion b ogram
Status Quo Year 2025 Commercial Sector

(in tons per year)

Material MSW	Row Lab	Total Disposed 1	Total Recycled 2	Total Generated 3	Percent Recycled (2/3)	Com Priv Rec 30	Foodware Rec/Comp 35
Aluminum Beverage	BALU	736	885	1,620	54.6%	885	-
Beverage Glass	BGLS	2,433	2,771	5,204	53.2%	2,771	-
Construction Debris	CDEB	6,325	-	6,325	0.0%	-	-
Container Glass	CGLS	175	-	175	0.0%	-	-
Computer Office Paper	CPO	9,862	16,023	25,886	61.9%	16,023	-
Food Cans	FFER	826	775	1,601	48.4%	775	-
Food	FOOD	31,193	42,553	73,746	57.7%	35,055	7,498
Miscellaneous	MISC	16,927	30,334	47,260	64.2%	30,334	-
Mixed Scrap Paper	MWP	7,536	25,197	32,733	77.0%	25,197	-
Newspaper	NP	7,907	23,919	31,825	75.2%	23,919	-
Other Paper	NRP	10,230	8,119	18,349	44.2%	-	8,119
Other Aluminum	OALU	499	-	499	0.0%	-	-
Corrugated Kraft	OCC	13,723	52,004	65,727	79.1%	52,004	-
Other Ferrous	OFER	5,479	6,942	12,421	55.9%	6,942	-
Other Glass	OGLS	3,009	971	3,980	24.4%	971	-
Other NonFerrous	ONFR	43	-	43	0.0%	-	-
Other Organics	OORG	5,094	-	5,094	0.0%	-	-
Plastics	PLST	29,765	5,162	34,927	14.8%	4,407	755
Wood	WOOD	12,749	-	12,749	0.0%	-	-
Yard	YARD	3,802	20,899	24,701	84.6%	20,899	-
Total	**Grand T**	**168,312**	**236,554**	**404,866**	**58.4%**	**220,181**	**16,373**

Year	Total Disposed 1	Total Recycled 2	Total Generated 3	Percent Recycled (2/3)
1997	208,670	194,323	402,994	48.2%
1998	213,646	194,251	407,896	47.6%
1999	225,348	199,968	425,316	47.0%
2000	228,417	162,989	391,405	41.6%
2001	228,405	149,453	377,858	39.6%
2002	217,195	149,025	366,220	40.7%
2003	213,247	126,956	340,202	37.3%
2004	216,112	159,341	375,453	42.4%
2005	205,819	179,265	385,083	46.6%
2006	201,231	215,258	416,489	51.7%
2007	198,493	219,894	418,387	52.6%
2008	176,774	213,493	390,267	54.7%
2009	151,398	184,593	335,992	54.9%
2010	171,363	207,450	378,813	54.8%
2011	169,610	210,521	380,131	55.4%
2012	167,487	216,002	383,489	56.3%
2013	164,278	220,182	384,460	57.3%
2014	162,467	223,302	385,769	57.9%
2015	161,600	224,815	386,415	58.2%
2016	161,450	225,753	387,203	58.3%
2017	161,556	226,369	387,925	58.4%
2018	161,985	227,170	389,155	58.4%
2019	162,600	228,119	390,718	58.4%
2020	163,633	229,723	393,356	58.4%
2021	164,609	231,166	395,775	58.4%
2022	165,531	232,529	398,060	58.4%
2023	166,430	233,845	400,275	58.4%
2024	167,354	235,184	402,538	58.4%
2025	168,312	236,554	404,866	58.4%
2026	169,306	237,962	407,268	58.4%
2027	170,303	239,371	409,674	58.4%
2028	171,321	240,822	412,143	58.4%
2029	172,361	242,297	414,658	58.4%
2030	173,392	243,750	417,142	58.4%

Summ - Program Sector Materials Diversion b rogram
Status Quo Year 2025 Commercial Sector

Material MSW	Row Lab
Aluminum Beverage	BALU
Beverage Glass	BGLS
Construction Debris	CDEB
Container Glass	CGLS
Computer Office Paper	CPO
Food Cans	FFER
Food	FOOD
Miscellaneous	MISC
Mixed Scrap Paper	MWP
Newspaper	NP
Other Paper	NRP
Other Aluminum	OALU
Corrugated Kraft	OCC
Other Ferrous	OFER
Other Glass	OGLS
Other NonFerrous	ONFR
Other Organics	OORG
Plastics	PLST
Wood	WOOD
Yard	YARD
Total	Grand T

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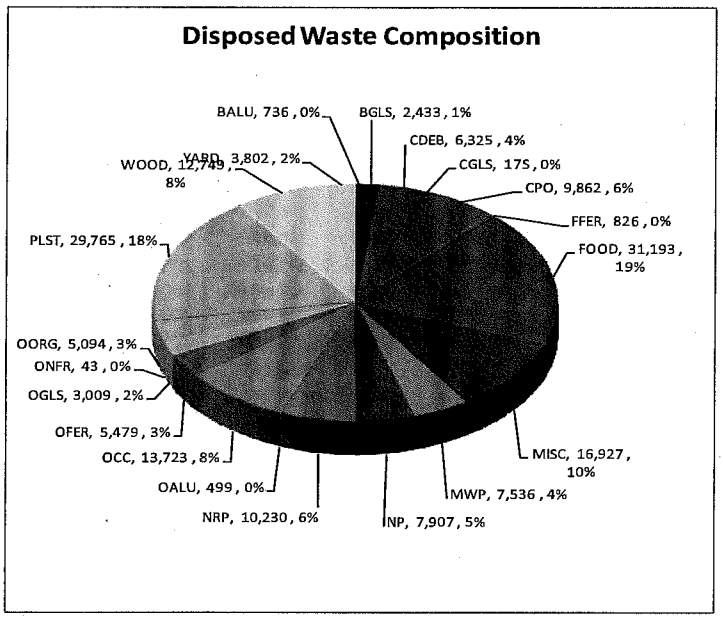

Summa Program Sector Materials Diversion b rogram

Status Quo Year 2025 Self Haul Sector

(in tons per year)

Material MSW	Row Lab	Total Disposed 1	Total Recycled 2	Total Generated 3	Percent Recycled (2/3)	Clean Green 21	Drop Sites 23	ABC Ban 22
Aluminum Beverage	BALU	69	4	73	5.9%	-	4	-
Beverage Glass	BGLS	285	537	822	65.3%	-	537	-
Construction Debris	CDEB	16,889	4,722	21,611	21.8%	-	-	4,722
Container Glass	CGLS	57	-	57	0.0%	-	-	-
Computer Office Paper	CPO	830	-	830	0.0%	-	-	-
Food Cans	FFER	65	-	65	0.0%	-	-	-
Food	FOOD	2,883	-	2,883	0.0%	-	-	-
Miscellaneous	MISC	24,151	63	24,215	0.3%	-	63	-
Mixed Scrap Paper	MWP	1,777	477	2,253	21.2%	-	477	-
Newspaper	NP	3	385	388	99.3%	-	385	-
Other Paper	NRP	1,526	-	1,526	0.0%	-	-	-
Other Aluminum	OALU	160	-	160	0.0%	-	-	-
Corrugated Kraft	OCC	2,733	1,006	3,739	26.9%	-	1,006	-
Other Ferrous	OFER	4,928	5,048	9,976	50.6%	-	5,048	-
Other Glass	OGLS	1,733	-	1,733	0.0%	-	-	-
Other NonFerrous	ONFR	129	-	129	0.0%	-	-	-
Other Organics	OORG	2,857	-	2,857	0.0%	-	-	-
Plastics	PLST	6,238	27	6,265	0.4%	-	27	-
Wood	WOOD	37,400	245	37,644	0.6%	-	245	-
Yard	YARD	4,520	14,081	18,601	75.7%	14,081	-	-
Total	**Grand Tc**	**109,231**	**26,595**	**135,826**	**19.6%**	**14,081**	**7,792**	**4,722**

Year	Total Disposed 1	Total Recycled 2	Total Generated 3	Percent Recycled (2/3)
1997	97,146	19,137	116,283	16.5%
1998	98,019	18,410	116,429	15.8%
1999	104,367	20,304	124,671	16.3%
2000	101,883	21,141	123,024	17.2%
2001	102,305	22,137	124,442	17.8%
2002	102,891	22,693	125,584	18.1%
2003	101,232	22,325	123,557	18.1%
2004	99,766	23,070	122,836	18.8%
2005	100,499	23,157	123,656	18.7%
2006	103,428	24,022	127,450	18.8%
2007	107,098	25,492	132,591	19.2%
2008	90,673	20,556	111,229	18.5%
2009	81,565	16,328	97,893	16.7%
2010	91,226	18,257	109,484	16.7%
2011	93,001	18,604	111,605	16.7%
2012	94,797	20,230	115,027	17.6%
2013	96,002	21,574	117,576	18.3%
2014	96,914	22,831	119,745	19.1%
2015	97,759	23,611	121,371	19.5%
2016	98,857	24,054	122,911	19.6%
2017	99,475	24,229	123,704	19.6%
2018	100,774	24,542	125,317	19.6%
2019	101,965	24,829	126,794	19.6%
2020	103,128	25,110	128,239	19.6%
2021	104,283	25,391	129,674	19.6%
2022	105,514	25,690	131,204	19.6%
2023	106,749	25,991	132,740	19.6%
2024	107,986	26,292	134,279	19.6%
2025	109,231	26,595	135,826	19.6%
2026	110,473	26,898	137,370	19.6%
2027	111,706	27,198	138,904	19.6%
2028	112,899	27,488	140,387	19.6%
2029	114,068	27,773	141,841	19.6%
2030	115,282	28,069	143,351	19.6%

Summ[illegible] Program Sector Materials Diversion [illegible]rogram

Status Quo Year 2025 Self Haul Sector

Material MSW	Row Lab
Aluminum Beverage	BALU
Beverage Glass	BGLS
Construction Debris	CDEB
Container Glass	CGLS
Computer Office Paper	CPO
Food Cans	FFER
Food	FOOD
Miscellaneous	MISC
Mixed Scrap Paper	MWP
Newspaper	NP
Other Paper	NRP
Other Aluminum	OALU
Corrugated Kraft	OCC
Other Ferrous	OFER
Other Glass	OGLS
Other NonFerrous	ONFR
Other Organics	OORG
Plastics	PLST
Wood	WOOD
Yard	YARD
Total	**Grand T[illegible]**

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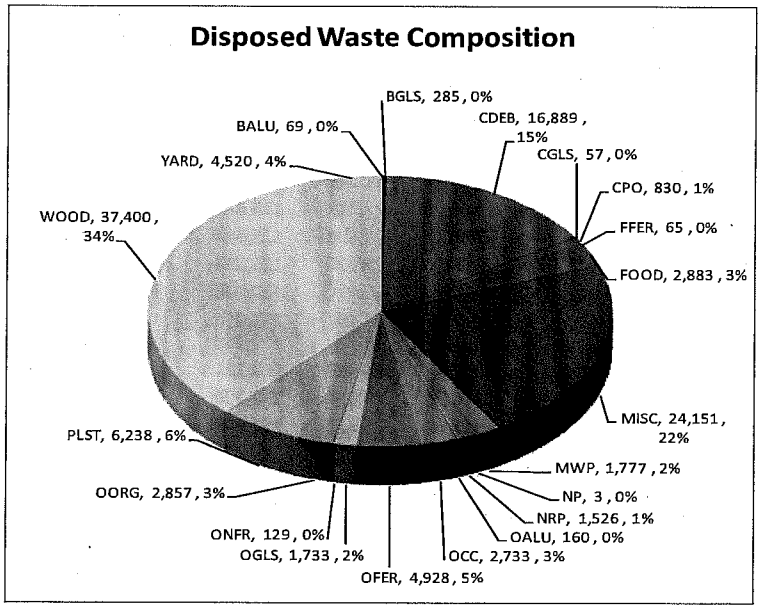

Sur ary of Recycling Program Benefits and sts
Status Quo Newest Programs

All Programs in Scenario 4/1/11 5:00 PM (All costs in 2010 dollars)

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	$17,279,271	$116,013	$262,341	$773,665	$1,241,656	$1,616,495
Program Cost	$15,393,862	$431,561	$807,500	$1,100,735	$1,090,861	$1,366,545
Net Benefits	$1,885,409	($315,548)	($545,159)	($327,070)	$150,795	$249,950
Tons avoided through recycling	**470,280**	**1,840**	**4,161**	**10,516**	**16,485**	**21,123**

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	$6,239,071	$ -	$ -	$ 228,037	$ 418,673	$ 593,199
Program Cost	$3,389,494	$ -	$ 200,000	$ 212,001	$ 213,632	$ 299,351
Net Benefits	$2,849,577	$ -	$ (200,000)	$ 16,036	$ 205,041	$ 293,848
Tons avoided through recycling	**94,700**	**-**	**-**	**1,647**	**3,024**	**4,285**
PV per ton	$30					

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	$1,871,710	$ -	$ -	$ 54,257	$ 103,107	$ 153,534
Program Cost	$814,148	$ -	$ 10,000	$ 31,509	$ 50,875	$ 70,866
Net Benefits	$1,057,561	$ -	$ (10,000)	$ 22,748	$ 52,232	$ 82,668
Tons avoided through recycling	**78,822**	**-**	**-**	**1,075**	**2,044**	**3,043**
PV per ton	$13					

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	$9,168,490	$ 116,013	$ 262,341	$ 491,371	$ 719,876	$ 869,762
Program Cost	$11,190,220	$ 431,561	$ 597,500	$ 857,225	$ 826,354	$ 996,328
Net Benefits	($2,021,729)	$ (315,548)	$ (335,159)	$ (365,854)	$ (106,478)	$ (126,566)
Tons avoided through recycling	**296,758**	**1,840**	**4,161**	**7,793**	**11,418**	**13,795**
PV per ton	($7)					

Summary of Recycling Program Benefits and Costs
Status Quo Newest Programs

All Programs in Scenario

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$1,807,319	$1,873,985	$1,897,780	$1,909,129	$1,918,579	$1,934,296
Program Cost	$1,503,495	$1,554,277	$1,568,364	$1,577,861	$1,585,448	$1,598,937
Net Benefits	$303,825	$319,708	$329,416	$331,268	$333,131	$335,359
Tons avoided through recycling	**23,553**	**24,524**	**24,903**	**25,110**	**25,267**	**25,498**

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$ 677,821	$ 695,942	$ 699,378	$ 698,591	$ 699,429	$ 702,868
Program Cost	$ 340,913	$ 349,813	$ 351,501	$ 351,114	$ 351,526	$ 353,215
Net Benefits	$ 336,908	$ 346,129	$ 347,877	$ 347,476	$ 347,903	$ 349,653
Tons avoided through recycling	**4,896**	**5,027**	**5,051**	**5,046**	**5,052**	**5,077**
PV per ton						

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$ 187,493	$ 205,347	$ 213,059	$ 218,318	$ 221,829	$ 224,709
Program Cost	$ 84,328	$ 91,406	$ 89,463	$ 91,548	$ 92,940	$ 94,082
Net Benefits	$ 103,165	$ 113,941	$ 123,595	$ 126,770	$ 128,889	$ 130,627
Tons avoided through recycling	**3,716**	**4,070**	**4,223**	**4,327**	**4,397**	**4,454**
PV per ton						

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$ 942,005	$ 972,696	$ 985,344	$ 992,220	$ 997,320	$ 1,006,719
Program Cost	$ 1,078,253	$ 1,113,057	$ 1,127,400	$ 1,135,198	$ 1,140,982	$ 1,151,640
Net Benefits	$ (136,248)	$ (140,361)	$ (142,056)	$ (142,978)	$ (143,661)	$ (144,921)
Tons avoided through recycling	**14,941**	**15,427**	**15,628**	**15,737**	**15,818**	**15,967**
PV per ton						

Sur ary of Recycling Program Benefits and sts
Status Quo Newest Programs

All Programs in Scenario

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$1,953,405	$1,972,659	$1,992,267	$2,012,292	$2,032,766	$2,053,537
Program Cost	$1,661,639	$1,624,161	$1,636,672	$1,649,437	$1,662,484	$1,675,805
Net Benefits	$291,766	$348,498	$355,595	$362,855	$370,282	$377,732
Tons avoided through recycling	**25,717**	**25,935**	**26,153**	**26,375**	**26,600**	**26,830**

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$ 713,784	$ 725,135	$ 737,150	$ 749,515	$ 762,220	$ 775,030
Program Cost	$ 408,576	$ 364,152	$ 370,053	$ 376,126	$ 382,366	$ 388,657
Net Benefits	$ 305,207	$ 360,983	$ 367,097	$ 373,389	$ 379,854	$ 386,372
Tons avoided through recycling	**5,156**	**5,238**	**5,324**	**5,414**	**5,505**	**5,598**
PV per ton						

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$ 227,354	$ 230,086	$ 232,798	$ 235,503	$ 238,219	$ 240,928
Program Cost	$ 95,131	$ 96,213	$ 97,289	$ 98,361	$ 99,438	$ 100,512
Net Benefits	$ 132,224	$ 133,872	$ 135,509	$ 137,142	$ 138,782	$ 140,417
Tons avoided through recycling	**4,507**	**4,561**	**4,614**	**4,668**	**4,722**	**4,776**
PV per ton						

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$ 1,012,267	$ 1,017,439	$ 1,022,319	$ 1,027,274	$ 1,032,327	$ 1,037,579
Program Cost	$ 1,157,932	$ 1,163,796	$ 1,169,331	$ 1,174,950	$ 1,180,681	$ 1,186,636
Net Benefits	$ (145,665)	$ (146,358)	$ (147,012)	$ (147,676)	$ (148,353)	$ (149,057)
Tons avoided through recycling	**16,055**	**16,137**	**16,214**	**16,293**	**16,373**	**16,456**
PV per ton						

Su ary of Recycling Program Benefits an osts
Status Quo Newest Programs

All Programs in Scenario

Year	2027	2028	2029	2030
Program Benefits	$2,074,575	$2,096,221	$2,118,328	$2,141,066
Program Cost	$1,689,327	$1,703,326	$1,717,633	$1,732,156
Net Benefits	$385,248	$392,895	$400,694	$408,910
Tons avoided through recycling	**27,062**	**27,300**	**27,541**	**27,787**

Year	2027	2028	2029	2030
Program Benefits	$ 788,021	$ 801,443	$ 815,257	$ 829,741
Program Cost	$ 395,038	$ 401,630	$ 408,415	$ 415,529
Net Benefits	$ 392,983	$ 399,813	$ 406,842	$ 414,212
Tons avoided through recycling	**5,692**	**5,789**	**5,888**	**5,993**
PV per ton				

Year	2027	2028	2029	2030
Program Benefits	$ 243,618	$ 246,220	$ 248,771	$ 251,418
Program Cost	$ 101,578	$ 102,610	$ 103,621	$ 104,670
Net Benefits	$ 142,040	$ 143,611	$ 145,150	$ 146,748
Tons avoided through recycling	**4,829**	**4,880**	**4,931**	**4,984**
PV per ton				

Year	2027	2028	2029	2030
Program Benefits	$ 1,042,936	$ 1,048,558	$ 1,054,300	$ 1,059,908
Program Cost	$ 1,192,711	$ 1,199,086	$ 1,205,597	$ 1,211,957
Net Benefits	$ (149,775)	$ (150,528)	$ (151,298)	$ (152,049)
Tons avoided through recycling	**16,541**	**16,631**	**16,722**	**16,811**
PV per ton				

Summary - Program Tons Per Year
Scenario 31, Recommended

				Order ->	15	1	2	3	4	5
Year	Recycle Rate	Total Material	Total Diposed	Total Recycled	Curb/ Apt Rec	BY YW In City	BY FW In City	Grass-cycle	BY YW Not City	BY FW Not City
		-	-	-	2	3	4	5	6	7
1997	44.4%	816,174	453,787	362,386	67,509	6,779	16,470	5,119	7,400	2,520
1998	44.2%	820,212	457,598	362,613	70,279	6,680	15,887	6,038	7,700	2,823
1999	44.0%	852,299	477,433	374,866	73,478	4,002	15,590	10,660	8,000	3,127
2000	40.0%	793,825	476,131	317,693	72,864	4,002	873	10,660	8,000	3,127
2001	39.3%	782,894	475,270	307,623	72,382	4,002	873	10,660	8,000	3,127
2002	39.7%	768,422	462,996	305,426	72,543	4,002	873	10,660	8,000	3,127
2003	38.2%	741,656	458,010	283,646	73,780	4,002	873	10,660	8,000	3,127
2004	41.2%	780,061	458,405	321,656	76,860	4,800	2,400	9,900	5,000	1,800
2005	44.2%	789,740	440,876	348,864	81,139	4,600	2,100	9,600	4,800	1,600
2006	47.6%	836,373	438,380	397,993	84,531	4,600	2,100	9,600	4,800	1,600
2007	48.3%	848,125	438,845	409,280	86,621	4,600	2,100	9,600	4,800	1,600
2008	50.0%	789,607	394,607	395,000	81,888	4,600	2,100	9,600	4,800	1,600
2009	51.1%	719,423	351,688	367,735	76,584	2,600	1,100	7,100	3,500	1,700
2010	50.9%	780,664	383,438	397,226	78,554	2,655	1,123	7,251	3,575	1,736
2011	51.2%	783,186	382,112	401,074	78,487	2,640	1,117	7,211	3,554	1,726
2012	52.2%	789,299	377,271	412,028	78,285	2,628	1,112	7,176	3,538	1,718
2013	54.1%	791,832	363,453	428,379	77,923	2,612	1,105	7,134	3,517	1,708
2014	56.9%	794,323	342,118	452,205	77,247	2,597	1,099	7,092	3,496	1,698
2015	60.0%	795,698	318,222	477,476	76,491	2,582	1,093	7,053	3,477	1,688
2016	62.5%	798,068	299,551	498,517	76,135	2,575	1,090	7,034	3,468	1,684
2017	64.7%	802,464	283,490	518,974	76,708	2,596	1,098	7,091	3,496	1,697
2018	65.6%	804,837	277,168	527,669	76,507	2,583	1,093	7,055	3,478	1,688
2019	67.3%	807,071	264,284	542,787	76,266	2,568	1,087	7,015	3,459	1,679
2020	68.7%	810,694	253,741	556,953	76,136	2,556	1,082	6,983	3,443	1,671
2021	69.6%	816,837	248,245	568,592	76,738	2,568	1,087	7,017	3,460	1,679
2022	70.1%	822,953	246,242	576,711	77,347	2,581	1,092	7,051	3,476	1,687
2023	70.4%	829,180	245,651	583,529	78,002	2,595	1,098	7,089	3,495	1,696
2024	70.6%	835,530	245,254	590,276	78,677	2,609	1,104	7,127	3,514	1,706
2025	70.9%	842,027	245,233	596,795	79,372	2,624	1,110	7,168	3,534	1,715
2026	71.0%	848,581	246,070	602,511	80,063	2,638	1,116	7,207	3,553	1,725
2027	71.0%	855,143	247,654	607,489	80,758	2,652	1,122	7,246	3,572	1,734
2028	71.0%	861,830	249,647	612,183	81,483	2,667	1,129	7,287	3,593	1,744
2029	71.0%	868,628	251,839	616,789	82,232	2,683	1,135	7,330	3,614	1,754
2030	71.0%	875,647	254,180	621,467	83,034	2,700	1,143	7,377	3,637	1,765

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Summary - Program Tons Per Year
Scenario 31, Recommended

	17	22	25	27	28	20	33	42	30	9
Year	Curb/ Apt Org	Clean Green	Drop Sites	Com Priv Rec	Food-ware Rec/ Comp	MF Univer Org Serv	Incr Res Ban Enforce	Carpet	Enhance Com Paper Ban Enforce	Phone & Junk Opt Out
	8	21	23	30	35	13	19	36	38	44
1997	43,130	14,137	5,000	194,323	-	-	-	-	-	-
1998	40,546	13,034	5,376	194,251	-	-	-	-	-	-
1999	39,737	13,692	6,612	199,968	-	-	-	-	-	-
2000	34,037	14,032	7,109	162,989	-	-	-	-	-	-
2001	36,990	15,034	7,103	149,453	-	-	-	-	-	-
2002	34,503	14,353	8,340	149,025	-	-	-	-	-	-
2003	33,923	14,156	8,170	126,956	-	-	-	-	-	-
2004	38,485	14,907	8,163	159,341	-	-	-	-	-	-
2005	42,603	13,925	9,232	179,265	-	-	-	-	-	-
2006	51,482	14,277	9,745	215,258	-	-	-	-	-	-
2007	54,573	14,247	11,246	219,894	-	-	-	-	-	-
2008	56,364	11,893	8,662	213,493	-	-	-	-	-	-
2009	74,230	10,149	6,179	184,593	-	-	-	-	-	-
2010	76,624	11,351	6,907	205,610	1,840	-	-	-	-	-
2011	77,214	11,571	7,033	206,360	4,161	-	-	-	-	-
2012	78,462	11,925	7,229	208,209	7,793	1,647	1,052	93	790	371
2013	79,800	12,190	7,341	208,764	11,418	3,024	2,325	237	1,993	834
2014	80,962	12,414	7,373	209,507	13,795	4,285	4,235	543	4,511	1,552
2015	82,021	12,583	7,309	209,800	14,941	4,896	6,086	1,021	8,403	2,281
2016	83,062	12,742	7,235	210,186	15,427	5,027	7,272	1,509	12,311	2,770
2017	84,518	12,824	7,173	210,536	15,628	5,051	7,911	1,830	14,860	3,041
2018	84,526	12,992	7,213	211,185	15,737	5,046	8,141	1,356	16,121	3,132
2019	84,252	13,145	7,276	212,031	15,818	5,052	8,219	1,415	16,686	3,157
2020	83,989	13,295	7,350	213,477	15,967	5,077	8,253	1,447	16,992	3,160
2021	84,488	13,443	7,429	214,826	16,055	5,156	8,346	1,470	17,157	3,183
2022	84,974	13,602	7,515	216,103	16,137	5,238	8,432	1,490	17,275	3,203
2023	85,501	13,761	7,603	217,340	16,214	5,324	8,521	1,508	17,374	3,224
2024	86,043	13,921	7,691	218,598	16,293	5,414	8,611	1,526	17,467	3,244
2025	86,601	14,081	7,779	219,885	16,373	5,505	8,703	1,543	17,562	3,266
2026	87,150	14,241	7,868	221,207	16,456	5,598	8,795	1,561	17,659	3,286
2027	87,699	14,400	7,955	222,528	16,541	5,692	8,888	1,578	17,756	3,307
2028	88,276	14,554	8,040	223,887	16,631	5,789	8,984	1,595	17,857	3,329
2029	88,874	14,705	8,124	225,269	16,722	5,888	9,084	1,612	17,960	3,351
2030	89,524	14,861	8,210	226,630	16,811	5,993	9,190	1,629	18,060	3,376

...mmary - Program Tons Per Ye...
Scenario 31, Recommended

Year	ABC Ban	Ban Asphalt Shingles	Floor Sort 50% C&D	Enhanc Com Org	Restore Educa-tion	Educa-tion Audits	Plast Film Ban	SF Org Ban	Reuse Bag Res	Extend Com Ban
	23	*52*	*44*	*45*	*38*	*41*	*46*	*21*	*6*	*32*
	22	26	29	37	41	43	50	18	20	39
1997	-	-	-	-	-	-	-	-	-	-
1998	-	-	-	-	-	-	-	-	-	-
1999	-	-	-	-	-	-	-	-	-	-
2000	-	-	-	-	-	-	-	-	-	-
2001	-	-	-	-	-	-	-	-	-	-
2002	-	-	-	-	-	-	-	-	-	-
2003	-	-	-	-	-	-	-	-	-	-
2004	-	-	-	-	-	-	-	-	-	-
2005	-	-	-	-	-	-	-	-	-	-
2006	-	-	-	-	-	-	-	-	-	-
2007	-	-	-	-	-	-	-	-	-	-
2008	-	-	-	-	-	-	-	-	-	-
2009	-	-	-	-	-	-	-	-	-	-
2010	-	-	-	-	-	-	-	-	-	-
2011	-	-	-	-	-	-	-	-	-	-
2012	-	-	-	-	-	-	-	-	-	-
2013	1,401	646	2,216	935	519	400	336	-	-	-
2014	2,642	693	4,935	2,020	1,141	907	618	1,881	10	733
2015	3,903	628	8,961	3,670	2,044	1,682	892	4,114	22	1,655
2016	4,748	542	12,715	-	2,870	2,396	1,053	7,545	43	3,084
2017	5,159	486	15,069	-	3,371	2,852	1,115	11,073	67	4,520
2018	4,278	463	16,319	-	3,615	3,091	95	13,254	85	5,466
2019	4,378	457	16,937	-	3,729	3,209	97	14,244	95	5,938
2020	4,447	458	17,293	-	3,790	3,276	98	14,614	100	6,170
2021	4,504	461	17,548	-	3,839	3,325	99	14,853	102	6,284
2022	4,560	466	17,778	-	3,882	3,368	101	14,987	104	6,352
2023	4,614	471	17,995	-	3,923	3,409	102	15,091	105	6,402
2024	4,668	476	18,206	-	3,963	3,449	103	15,182	106	6,448
2025	4,722	482	18,417	-	4,003	3,489	104	15,271	107	6,492
2026	4,776	487	18,627	-	4,044	3,529	105	15,356	108	6,537
2027	4,829	493	18,835	-	4,084	3,568	107	15,440	109	6,582
2028	4,880	498	19,036	-	4,124	3,606	108	15,528	110	6,628
2029	4,931	503	19,234	-	4,164	3,644	109	15,619	111	6,675
2030	4,984	508	19,438	-	4,205	3,682	110	15,720	113	6,723

Summary - Program Tons Per Year
Scenario 31, Recommended

Year	53 Ban Clean Wood	31 MF Org Ban	18 Plast Bag Ban Res	13 Latex Paint Prod Stew	10 Divert Reuse-ables	49 Textile Market Dev	29 Ban Com Org	26 Pre Scale Recycle	55 Com C&D Ban	50 Pet Waste & Diapers
	45	14	16	42	52	12	32	51	46	15
1997	-	-	-	-	-	-	-	-	-	-
1998	-	-	-	-	-	-	-	-	-	-
1999	-	-	-	-	-	-	-	-	-	-
2000	-	-	-	-	-	-	-	-	-	-
2001	-	-	-	-	-	-	-	-	-	-
2002	-	-	-	-	-	-	-	-	-	-
2003	-	-	-	-	-	-	-	-	-	-
2004	-	-	-	-	-	-	-	-	-	-
2005	-	-	-	-	-	-	-	-	-	-
2006	-	-	-	-	-	-	-	-	-	-
2007	-	-	-	-	-	-	-	-	-	-
2008	-	-	-	-	-	-	-	-	-	-
2009	-	-	-	-	-	-	-	-	-	-
2010	-	-	-	-	-	-	-	-	-	-
2011	-	-	-	-	-	-	-	-	-	-
2012	-	-	-	-	-	-	-	-	-	-
2013	-	-	-	-	-	-	-	-	-	-
2014	4,219	-	-	-	-	-	-	-	-	-
2015	7,536	255	155	209	26	-	-	-	-	-
2016	10,570	589	288	390	48	87	1,234	786	-	-
2017	12,377	1,277	425	575	71	222	3,093	1,164	-	-
2018	6,666	2,333	512	696	87	512	6,984	1,424	3,935	-
2019	6,870	3,395	552	756	95	997	13,017	1,560	7,339	-
2020	6,996	4,101	569	784	99	1,563	19,180	1,627	10,752	159
2021	7,092	4,500	581	801	102	2,032	23,244	1,665	13,041	418
2022	7,183	4,712	589	812	103	2,311	25,266	1,692	14,193	1,049
2023	7,269	4,844	595	822	105	2,454	26,168	1,714	14,727	2,376
2024	7,354	4,946	602	831	106	2,527	26,587	1,735	15,000	4,442
2025	7,439	5,038	608	841	107	2,572	26,812	1,755	15,177	6,537
2026	7,524	5,125	614	851	108	2,605	26,967	1,775	15,319	7,929
2027	7,608	5,212	620	860	110	2,635	27,089	1,795	15,448	8,633
2028	7,689	5,302	626	870	111	2,664	27,212	1,815	15,568	8,963
2029	7,769	5,393	633	881	112	2,693	27,323	1,833	15,691	9,132
2030	7,852	5,489	640	892	113	2,724	27,421	1,853	15,819	9,243

Summa Program Sector Materials Diversion b ogram
Scenario 31, Recommended Year 2025 All MSW Sectors

(in tons per year)

Material MSW		Total Disposed 1	Total Recycled 2	Total Generated 3	Percent Recycled (2/3)	Curb/Apt Rec 2	BY YW In City 3	BY FW In City 4	Grasscycle 5	BY YW Not City 6	BY FW Not City 7
Aluminum Beverage	BALU	405	2,628	3,033	86.6%	965	-	-	-	-	-
Beverage Glass	BGLS	1,703	21,354	23,056	92.6%	15,229	-	-	-	-	-
Construction Debris	CDEB	16,407	14,308	30,715	46.6%	-	-	-	-	-	-
Container Glass	CGLS	257	3,356	3,613	92.9%	2,981	-	-	-	-	-
Computer Office Paper	CPO	6,533	21,301	27,834	76.5%	-	-	-	-	-	-
Food Cans	FFER	616	2,936	3,552	82.7%	1,082	-	-	-	-	-
Food	FOOD	16,591	119,243	135,834	87.8%	-	-	1,110	-	-	1,715
Miscellaneous	MISC	45,917	32,872	78,789	41.7%	-	-	-	-	-	-
Mixed Scrap Paper	MWP	8,343	61,803	70,147	88.1%	25,367	-	-	-	-	-
Newspaper	NP	4,665	44,393	49,058	90.5%	15,792	-	-	-	-	-
Other Paper	NRP	13,182	22,608	35,790	63.2%	-	-	-	-	-	-
Other Aluminum	OALU	763	401	1,164	34.5%	-	-	-	-	-	-
Corrugated Kraft	OCC	9,386	75,833	85,219	89.0%	13,453	-	-	-	-	-
Other Ferrous	OFER	5,162	19,985	25,147	79.5%	630	-	-	-	-	-
Other Glass	OGLS	5,140	971	6,110	15.9%	-	-	-	-	-	-
Other NonFerrous	ONFR	145	71	216	33.0%	-	-	-	-	-	-
Other Organics	OORG	30,657	9,109	39,766	22.9%	-	-	-	-	-	-
Plastics	PLST	44,588	13,831	58,419	23.7%	3,874	-	-	-	-	-
Wood	WOOD	26,177	28,112	54,289	51.8%	-	-	-	-	-	-
Yard	YARD	8,596	101,680	110,276	92.2%	-	2,624	-	7,168	3,534	-
Total	**Grand T**	**245,233**	**596,795**	**842,027**	**70.9%**	**79,372**	**2,624**	**1,110**	**7,168**	**3,534**	**1,715**

Year	Total Disposed 1	Total Recycled 2	Total Generated 3	Percent Recycled (2/3)
1997	453,787	362,386	816,174	44.4%
1998	457,598	362,613	820,212	44.2%
1999	477,433	374,866	852,299	44.0%
2000	476,131	317,693	793,825	40.0%
2001	475,270	307,623	782,894	39.3%
2002	462,996	305,426	768,422	39.7%
2003	458,010	283,646	741,656	38.2%
2004	458,405	321,656	780,061	41.2%
2005	440,876	348,864	789,740	44.2%
2006	438,380	397,993	836,373	47.6%
2007	438,845	409,280	848,125	48.3%
2008	394,607	395,000	789,607	50.0%
2009	351,688	367,735	719,423	51.1%
2010	383,438	397,226	780,664	50.9%
2011	382,112	401,074	783,186	51.2%
2012	377,271	412,028	789,299	52.2%
2013	363,453	428,379	791,832	54.1%
2014	342,118	452,205	794,323	56.9%
2015	318,222	477,476	795,698	60.0%
2016	299,551	498,517	798,068	62.5%
2017	283,490	518,974	802,464	64.7%
2018	277,168	527,669	804,837	65.6%
2019	264,284	542,787	807,071	67.3%
2020	253,741	556,953	810,694	68.7%
2021	248,245	568,592	816,837	69.6%
2022	246,242	576,711	822,953	70.1%
2023	245,651	583,529	829,180	70.4%
2024	245,254	590,276	835,530	70.6%
2025	245,233	596,795	842,027	70.9%
2026	246,070	602,511	848,581	71.0%
2027	247,654	607,489	855,143	71.0%
2028	249,647	612,183	861,830	71.0%
2029	251,839	616,789	868,628	71.0%
2030	254,180	621,467	875,647	71.0%

Summ - Program Sector Materials Diversion b, rogram
Scenario 31, Recommended Year 2025 All MSW Sectors

Material MSW		Curb/Apt Org 8	Textile Market Dev 12	MF Univer Org Serv 13	MF Org Ban 14	Pet Waste & Diapers 15	Plast Bag Ban Res 16	SF Org Ban 18	Incr Res Ban Enforce 19	Reuse Bag Res 20	Clean Green 21	ABC Ban 22
Aluminum Beverage	BALU	-	-	-	-	-	-	-	202	-	-	-
Beverage Glass	BGLS	-	-	-	-	-	-	-	925	-	-	-
Construction Debris	CDEB	-	-	-	-	-	-	-	-	-	-	4,722
Container Glass	CGLS	-	-	-	-	-	-	-	223	-	-	-
Computer Office Paper	CPO	-	-	-	-	-	-	-	558	-	-	-
Food Cans	FFER	-	-	-	-	-	-	-	434	-	-	-
Food	FOOD	31,632	-	4,499	3,916	-	-	11,053	-	-	-	-
Miscellaneous	MISC	-	-	-	-	-	-	-	-	-	-	-
Mixed Scrap Paper	MWP	-	-	-	-	-	-	-	3,452	-	-	-
Newspaper	NP	-	-	-	-	-	-	-	545	-	-	-
Other Paper	NRP	3,735	-	1,006	1,122	-	-	4,218	-	-	-	-
Other Aluminum	OALU	-	-	-	-	-	-	-	-	-	-	-
Corrugated Kraft	OCC	-	-	-	-	-	-	-	1,147	-	-	-
Other Ferrous	OFER	-	-	-	-	-	-	-	-	-	-	-
Other Glass	OGLS	-	-	-	-	-	-	-	-	-	-	-
Other NonFerrous	ONFR	-	-	-	-	-	-	-	-	-	-	-
Other Organics	OORG	-	2,572	-	-	6,537	-	-	-	-	-	-
Plastics	PLST	-	-	-	-	-	608	-	-	107	-	-
Wood	WOOD	-	-	-	-	-	-	-	-	-	-	-
Yard	YARD	51,235	-	-	-	-	-	-	1,217	-	14,081	-
Total	**Grand T**	**86,601**	**2,572**	**5,505**	**5,038**	**6,537**	**608**	**15,271**	**8,703**	**107**	**14,081**	**4,722**

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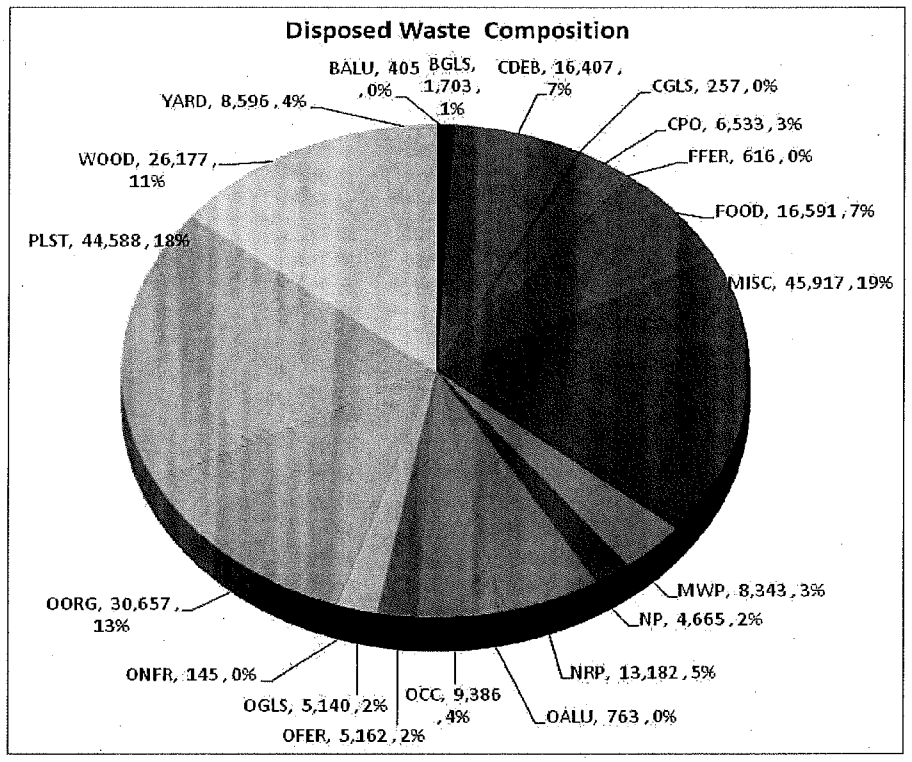

Summa Program Sector Materials Diversion b ogram
Scenario 31, Recommended Year 2025 All MSW Sectors

Material MSW		Drop Sites 23	Ban Asphalt Shingles 26	Floor Sort 50% C&D 29	Com Priv Rec 30	Ban Com Org 32	Foodware Rec/Comp 35	Carpet 36	Enhanc Com Org 37	Enhance Com Paper Ban Enforce 38	Extend Com Ban 39
Aluminum Beverage	BALU	4	-	-	885	-	-	-	-	-	539
Beverage Glass	BGLS	537	-	-	2,771	-	-	-	-	-	1,781
Construction Debris	CDEB	-	482	7,167	-	-	-	-	-	-	-
Container Glass	CGLS	-	-	-	-	-	-	-	-	-	128
Computer Office Paper	CPO	-	-	-	16,023	-	-	-	-	4,438	-
Food Cans	FFER	-	-	-	775	-	-	-	-	-	604
Food	FOOD	-	-	-	35,055	22,404	7,498	-	-	-	-
Miscellaneous	MISC	63	-	-	30,038	-	-	1,543	-	-	-
Mixed Scrap Paper	MWP	477	-	-	25,197	-	-	-	-	3,391	-
Newspaper	NP	385	-	-	23,919	-	-	-	-	3,558	-
Other Paper	NRP	-	-	-	-	4,408	8,119	-	-	-	-
Other Aluminum	OALU	-	-	-	-	-	-	-	-	-	365
Corrugated Kraft	OCC	1,006	-	750	52,004	-	-	-	-	6,175	-
Other Ferrous	OFER	5,036	-	1,533	6,942	-	-	-	-	-	-
Other Glass	OGLS	-	-	-	971	-	-	-	-	-	-
Other NonFerrous	ONFR	-	-	42	-	-	-	-	-	-	-
Other Organics	OORG	-	-	-	-	-	-	-	-	-	-
Plastics	PLST	27	-	-	4,407	-	755	-	-	-	3,075
Wood	WOOD	244	-	8,925	-	-	-	-	-	-	-
Yard	YARD	-	-	-	20,899	-	-	-	-	-	-
Total	**Grand T**	**7,779**	**482**	**18,417**	**219,885**	**26,812**	**16,373**	**1,543**	**-**	**17,562**	**6,492**

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Summ[illegible] - Program Sector Materials Diversion b[illegible] rogram
Scenario 31, Recommended Year 2025 All MSW Sectors

Material MSW		Restore Education 41	Latex Paint Prod Stew 42	Educatio n Audits 43	Phone & Junk Opt Out 44	Ban Clean Wood 45	Com C&D Ban 46	Plast Film Ban 50	Pre Scale Recycle 51	Divert Reusea bles 52	Total
Aluminum Beverage	BALU	17	-	4	-	-	-	-	12	-	2,628
Beverage Glass	BGLS	46	-	14	-	-	-	-	50	-	21,354
Construction Debris	CDEB	-	-	665	-	-	1,272	-	-	-	14,308
Container Glass	CGLS	11	-	3	-	-	-	-	10	-	3,356
Computer Office Paper	CPO	52	-	139	91	-	-	-	-	-	21,301
Food Cans	FFER	26	-	3	-	-	-	-	11	-	2,936
Food	FOOD	-	-	360	-	-	-	-	-	-	119,243
Miscellaneous	MISC	-	841	-	-	-	351	-	-	35	32,872
Mixed Scrap Paper	MWP	185	-	248	3,175	-	-	-	311	-	61,803
Newspaper	NP	194	-	-	-	-	-	-	0	-	44,393
Other Paper	NRP	-	-	-	-	-	-	-	-	-	22,608
Other Aluminum	OALU	27	-	10	-	-	-	-	-	-	401
Corrugated Kraft	OCC	438	-	382	-	-	-	-	478	-	75,833
Other Ferrous	OFER	466	-	246	-	-	4,248	-	860	25	19,985
Other Glass	OGLS	-	-	-	-	-	-	-	-	-	971
Other NonFerrous	ONFR	-	-	7	-	-	-	-	23	-	71
Other Organics	OORG	-	-	-	-	-	-	-	-	-	9,109
Plastics	PLST	-	-	36	-	-	839	104	-	-	13,831
Wood	WOOD	2,160	-	829	-	7,439	8,467	-	-	47	28,112
Yard	YARD	381	-	542	-	-	-	-	-	-	101,680
Total	**Grand T**	**4,003**	**841**	**3,489**	**3,266**	**7,439**	**15,177**	**104**	**1,755**	**107**	**596,795**

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Summa[illegible] - Program Sector Materials Diversion b[illegible]rogram
Scena[illegible] 31, Recommended Year 2025 Single Famil[illegible]ector

(in tons per year)

Material MSW		Total Disposed 1	Total Recycled 2	Total Generated 3	Percent Recycled (2/3)	Curb/Apt Rec 2	BY YW In City 3	BY FW In City 4	Grasscycle 5	BY YW Not City 6	BY FW Not City 7
Aluminum Beverage	BALU	71	877	948	92.5%	742	-	-	-	-	-
Beverage Glass	BGLS	264	11,075	11,339	97.7%	10,575	-	-	-	-	-
Construction Debris	CDEB	815	-	815	0.0%	-	-	-	-	-	-
Container Glass	CGLS	86	2,233	2,319	96.3%	2,070	-	-	-	-	-
Computer Office Paper	CPO	199	455	653	69.6%	-	-	-	-	-	-
Food Cans	FFER	151	1,121	1,272	88.1%	835	-	-	-	-	-
Food	FOOD	1,196	41,345	42,540	97.2%	-	-	1,110	-	-	1,715
Miscellaneous	MISC	3,164	88	3,252	2.7%	-	-	-	-	-	-
Mixed Scrap Paper	MWP	1,057	23,448	24,505	95.7%	18,507	-	-	-	-	-
Newspaper	NP	161	12,227	12,388	98.7%	11,923	-	-	-	-	-
Other Paper	NRP	2,373	7,042	9,416	74.8%	-	-	-	-	-	-
Other Aluminum	OALU	334	14	348	4.0%	-	-	-	-	-	-
Corrugated Kraft	OCC	284	9,328	9,611	97.0%	8,790	-	-	-	-	-
Other Ferrous	OFER	592	414	1,006	41.2%	390	-	-	-	-	-
Other Glass	OGLS	151	-	151	0.0%	-	-	-	-	-	-
Other NonFerrous	ONFR	3	-	3	0.0%	-	-	-	-	-	-
Other Organics	OORG	13,601	7,221	20,822	34.7%	-	-	-	-	-	-
Plastics	PLST	7,293	3,388	10,681	31.7%	2,951	-	-	-	-	-
Wood	WOOD	886	37	923	4.0%	-	-	-	-	-	-
Yard	YARD	319	63,671	63,989	99.5%	-	2,624	-	7,168	3,534	-
Total	**Grand**	**32,999**	**183,983**	**216,982**	**84.8%**	**56,782**	**2,624**	**1,110**	**7,168**	**3,534**	**1,715**

Year	Total Disposed 1	Total Recycled 2	Total Generated 3	Percent Recycled (2/3)
1997	88,783	137,555	226,337	60.8%
1998	87,560	137,686	225,247	61.1%
1999	88,631	141,956	230,586	61.6%
2000	87,499	120,969	208,468	58.0%
2001	91,072	120,910	211,982	57.0%
2002	87,834	118,640	206,474	57.5%
2003	87,426	118,322	205,748	57.5%
2004	86,029	123,103	209,132	58.9%
2005	80,479	128,197	208,676	61.4%
2006	78,078	138,810	216,889	64.0%
2007	77,494	142,634	220,127	64.8%
2008	73,961	139,928	213,889	65.4%
2009	67,229	147,786	215,015	68.7%
2010	67,893	151,706	219,599	69.1%
2011	66,550	151,809	218,360	69.5%
2012	64,092	153,222	217,314	70.5%
2013	61,391	154,644	216,035	71.6%
2014	56,935	157,829	214,764	73.5%
2015	52,567	160,998	213,565	75.4%
2016	47,829	165,141	212,970	77.5%
2017	44,073	170,588	214,661	79.5%
2018	41,145	172,447	213,592	80.7%
2019	39,404	172,962	212,366	81.4%
2020	38,275	173,119	211,394	81.9%
2021	37,834	174,590	212,424	82.2%
2022	37,290	176,161	213,451	82.5%
2023	36,258	178,332	214,590	83.1%
2024	34,627	181,139	215,766	84.0%
2025	32,999	183,983	216,982	84.8%
2026	31,995	186,176	218,171	85.3%
2027	31,598	187,758	219,357	85.6%
2028	31,543	189,063	220,606	85.7%
2029	31,638	190,268	221,906	85.7%
2030	31,806	191,521	223,328	85.8%

Summ - Program Sector Materials Diversion b rogram
Scenario 31, Recommended Year 2025 Single Family Sector

Material MSW		Curb/Apt Org	Textile Market Dev	Pet Waste & Diapers	Plast Bag Ban Res	SF Org Ban	Incr Res Ban Enforce	Reuse Bag Res	Restore Education	Phone & Junk Opt Out	Latex Paint Prod Stew	
	.	8	12	15	16	18	19	20	41	44	42	Total
Aluminum Beverage	BALU	-	-	-	-	-	132	-	3	-	-	877
Beverage Glass	BGLS	-	-	-	-	-	489	-	11	-	-	11,075
Construction Debris	CDEB	-	-	-	-	-	-	-	-	-	-	-
Container Glass	CGLS	-	-	-	-	-	160	-	4	-	-	2,233
Computer Office Paper	CPO	-	-	-	-	-	368	-	8	78	-	455
Food Cans	FFER	-	-	-	-	-	279	-	6	-	-	1,121
Food	FOOD	27,466	-	-	-	11,053	-	-	-	-	-	41,345
Miscellaneous	MISC	-	-	-	-	-	-	-	-	-	88	88
Mixed Scrap Paper	MWP	-	-	-	-	-	1,957	-	44	2,941	-	23,448
Newspaper	NP	-	-	-	-	-	298	-	7	-	-	12,227
Other Paper	NRP	2,825	-	-	-	4,218	-	-	-	-	-	7,042
Other Aluminum	OALU	-	-	-	-	-	-	-	14	-	-	14
Corrugated Kraft	OCC	-	-	-	-	-	525	-	12	-	-	9,328
Other Ferrous	OFER	-	-	-	-	-	-	-	25	-	-	414
Other Glass	OGLS	-	-	-	-	-	-	-	-	-	-	-
Other NonFerrous	ONFR	-	-	-	-	-	-	-	-	-	-	-
Other Organics	OORG	-	1,480	5,741	-	-	-	-	-	-	-	7,221
Plastics	PLST	-	-	-	368	-	-	69	-	-	-	3,388
Wood	WOOD	-	-	-	-	-	-	-	37	-	-	37
Yard	YARD	49,743	-	-	-	-	590	-	13	-	-	63,671
Total	**Grand**	**80,033**	**1,480**	**5,741**	**368**	**15,271**	**4,799**	**69**	**183**	**3,019**	**88**	**183,983**

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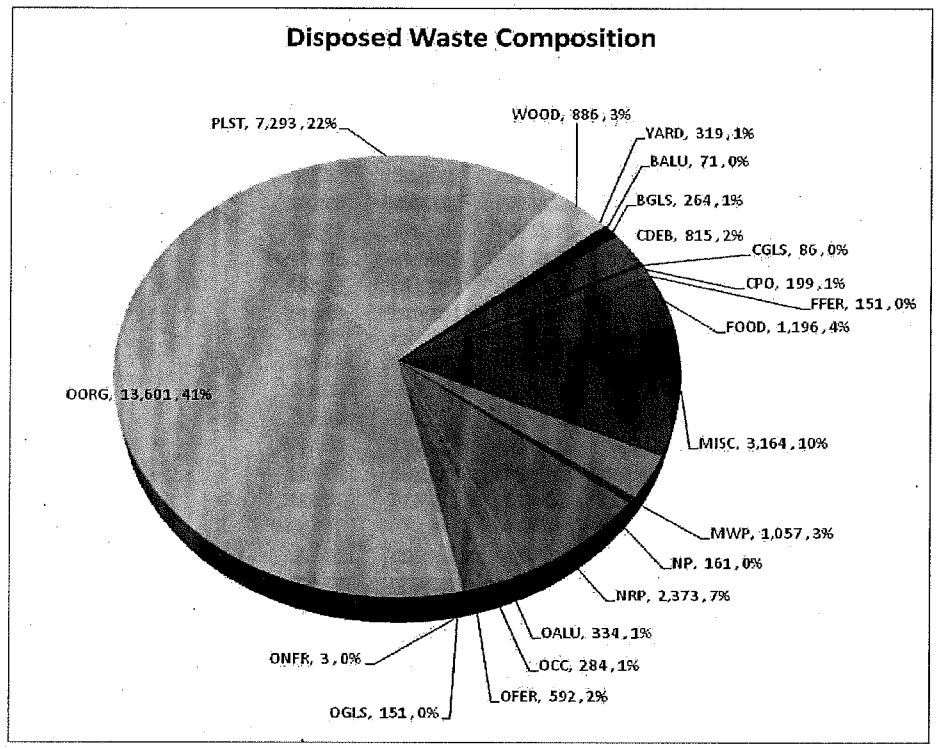

Summary - Program Sector Materials Diversion by Program
Scenario 31, Recommended Year 2025 Multi Family Sector

(in tons per year)

Material MSW	Row Lal	Total Disposed 1	Total Recycled 2	Total Generated 3	Percent Recycled (2/3)	Curb/Apt Rec 2	Curb/Apt Org 8	Textile Market Dev 12	Pet Waste & Diapers 15	Plast Bag Ban Res 16
Aluminum Beverage	BALU	93	298	391	76.2%	224	-	-	-	-
Beverage Glass	BGLS	601	5,090	5,692	89.4%	4,655	-	-	-	-
Construction Debris	CDEB	1,965	-	1,965	0.0%	-	-	-	-	-
Container Glass	CGLS	84	978	1,061	92.1%	911	-	-	-	-
Computer Office Paper	CPO	252	213	465	45.8%	-	-	-	-	-
Food Cans	FFER	205	409	615	66.6%	246	-	-	-	-
Food	FOOD	4,083	12,581	16,664	75.5%	-	4,166	-	-	-
Miscellaneous	MISC	3,770	292	4,062	7.2%	-	-	-	-	-
Mixed Scrap Paper	MWP	1,983	8,672	10,655	81.4%	6,860	-	-	-	-
Newspaper	NP	327	4,129	4,456	92.7%	3,869	-	-	-	-
Other Paper	NRP	3,461	3,038	6,499	46.7%	-	910	-	-	-
Other Aluminum	OALU	151	6	158	4.0%	-	-	-	-	-
Corrugated Kraft	OCC	824	5,318	6,143	86.6%	4,662	-	-	-	-
Other Ferrous	OFER	1,443	300	1,744	17.2%	240	-	-	-	-
Other Glass	OGLS	247	-	247	0.0%	-	-	-	-	-
Other NonFerrous	ONFR	41	-	41	0.0%	-	-	-	-	-
Other Organics	OORG	9,105	1,888	10,994	17.2%	-	-	1,092	796	-
Plastics	PLST	5,344	1,201	6,545	18.4%	923	-	-	-	240
Wood	WOOD	2,853	119	2,972	4.0%	-	-	-	-	-
Yard	YARD	831	2,154	2,985	72.2%	-	1,492	-	-	-
Total	**Grand T**	**37,665**	**46,688**	**84,353**	**55.3%**	**22,590**	**6,568**	**1,092**	**796**	**240**

Year	Total Disposed 1	Total Recycled 2	Total Generated 3	Percent Recycled (2/3)
1997	59,189	11,371	70,560	16.1%
1998	58,374	12,266	70,640	17.4%
1999	59,087	12,639	71,726	17.6%
2000	58,333	12,595	70,927	17.8%
2001	53,487	15,124	68,611	22.0%
2002	55,076	15,068	70,144	21.5%
2003	56,106	16,043	72,149	22.2%
2004	56,498	16,142	72,640	22.2%
2005	54,080	18,245	72,325	25.2%
2006	55,643	19,903	75,545	26.3%
2007	55,759	21,261	77,020	27.6%
2008	53,199	21,024	74,223	28.3%
2009	51,497	19,028	70,524	27.0%
2010	52,955	19,813	72,767	27.2%
2011	52,950	20,140	73,090	27.6%
2012	50,703	22,766	73,469	31.0%
2013	48,330	25,431	73,761	34.5%
2014	45,536	28,509	74,046	38.5%
2015	42,736	31,612	74,347	42.5%
2016	40,879	34,106	74,985	45.5%
2017	39,760	36,414	76,174	47.8%
2018	38,460	38,313	76,773	49.9%
2019	37,266	39,926	77,193	51.7%
2020	36,497	41,208	77,705	53.0%
2021	36,457	42,506	78,963	53.8%
2022	36,664	43,574	80,238	54.3%
2023	36,983	44,592	81,575	54.7%
2024	37,304	45,642	82,946	55.0%
2025	37,665	46,688	84,353	55.3%
2026	38,125	47,646	85,771	55.6%
2027	38,681	48,529	87,209	55.6%
2028	39,305	49,390	88,695	55.7%
2029	39,969	50,255	90,223	55.7%
2030	40,674	51,153	91,826	55.7%

Summary - Program Sector Materials Diversion by Program
Scenario 31, Recommended Year 2025 Multi Family Sector

Material MSW	Row Lal	Incr Res Ban Enforce 19	Reuse Bag Res 20	MF Univer Org Serv 13	MF Org Ban 14	Restore Education 41	Phone & Junk Opt Out 44	Latex Paint Prod Stew 42	Total
Aluminum Beverage	BALU	70	-	-	-	4	-	-	298
Beverage Glass	BGLS	436	-	-	-	-	-	-	5,090
Construction Debris	CDEB	-	-	-	-	-	-	-	-
Container Glass	CGLS	63	-	-	-	3	-	-	978
Computer Office Paper	CPO	190	-	-	-	11	12	-	213
Food Cans	FFER	155	-	-	-	9	-	-	409
Food	FOOD	-	-	4,499	3,916	-	-	-	12,581
Miscellaneous	MISC	-	-	-	-	-	-	292	292
Mixed Scrap Paper	MWP	1,495	-	-	-	83	234	-	8,672
Newspaper	NP	247	-	-	-	14	-	-	4,129
Other Paper	NRP	-	-	1,006	1,122	-	-	-	3,038
Other Aluminum	OALU	-	-	-	-	6	-	-	6
Corrugated Kraft	OCC	622	-	-	-	34	-	-	5,318
Other Ferrous	OFER	-	-	-	-	60	-	-	300
Other Glass	OGLS	-	-	-	-	-	-	-	-
Other NonFerrous	ONFR	-	-	-	-	-	-	-	-
Other Organics	OORG	-	-	-	-	-	-	-	1,888
Plastics	PLST	-	38	-	-	-	-	-	1,201
Wood	WOOD	-	-	-	-	119	-	-	119
Yard	YARD	627	-	-	-	35	-	-	2,154
Total	**Grand T**	**3,905**	**38**	**5,505**	**5,038**	**377**	**247**	**292**	**46,688**

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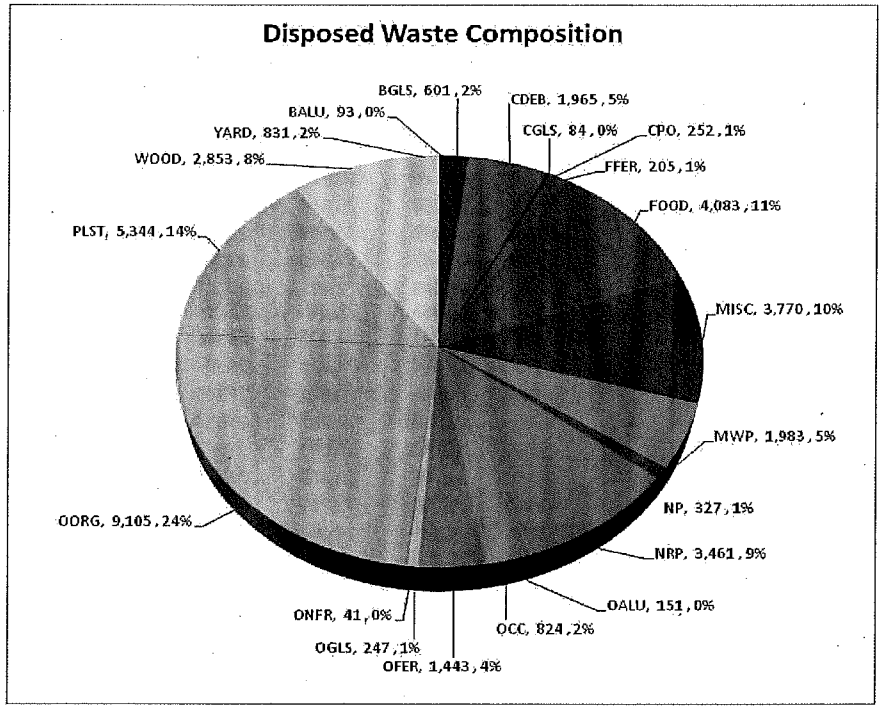

Summary - Program Sector Materials Diversion by Program
Scenario 31, Recommended Year 2025 Commercial Sector

(in tons per year)

Material MSW		Total Disposed 1	Total Recycled 2	Total Generated 3	Percent Recycled (2/3)	Com Priv Rec 30	Ban Com Org 32	Foodware Rec/Comp 35	Carpet 36	Enhanc Com Org 37
Aluminum Beverage	BALU	189	1,431	1,620	88.3%	885	-	-	-	-
Beverage Glass	BGLS	626	4,578	5,204	88.0%	2,771	-	-	-	-
Construction Debris	CDEB	5,053	1,272	6,325	20.1%	-	-	-	-	-
Container Glass	CGLS	45	130	175	74.3%	-	-	-	-	-
Computer Office Paper	CPO	5,424	20,461	25,886	79.0%	16,023	-	-	-	-
Food Cans	FFER	212	1,388	1,601	86.7%	775	-	-	-	-
Food	FOOD	8,790	64,957	73,746	88.1%	35,055	22,404	7,498	-	-
Miscellaneous	MISC	16,411	30,850	47,260	65.3%	30,038	-	-	-	-
Mixed Scrap Paper	MWP	4,143	28,590	32,733	87.3%	25,197	-	-	-	-
Newspaper	NP	4,175	27,651	31,825	86.9%	23,919	-	-	-	-
Other Paper	NRP	5,821	12,528	18,349	68.3%	-	4,408	8,119	-	-
Other Aluminum	OALU	134	365	499	73.2%	-	-	-	-	-
Corrugated Kraft	OCC	7,242	58,484	65,727	89.0%	52,004	-	-	-	-
Other Ferrous	OFER	1,009	11,412	12,421	91.9%	6,942	-	-	-	-
Other Glass	OGLS	3,009	971	3,980	24.4%	971	-	-	-	-
Other NonFerrous	ONFR	43	0	43	0.0%	-	-	-	-	-
Other Organics	OORG	5,094	-	5,094	0.0%	-	-	-	-	-
Plastics	PLST	25,847	9,080	34,927	26.0%	4,407	-	755	-	-
Wood	WOOD	3,772	8,977	12,749	70.4%	-	-	-	-	-
Yard	YARD	3,650	21,052	24,701	85.2%	20,899	-	-	-	-
Total	..	**100,690**	**304,177**	**404,866**	**75.1%**	**219,885**	**26,812**	**16,373**	**-**	**-**

Year	Total Disposed 1	Total Recycled 2	Total Generated 3	Percent Recycled (2/3)
1997	208,670	194,323	402,994	48.2%
1998	213,646	194,251	407,896	47.6%
1999	225,348	199,968	425,316	47.0%
2000	228,417	162,989	391,405	41.6%
2001	228,405	149,453	377,858	39.6%
2002	217,195	149,025	366,220	40.7%
2003	213,247	126,956	340,202	37.3%
2004	216,112	159,341	375,453	42.4%
2005	205,819	179,265	385,083	46.6%
2006	201,231	215,258	416,489	51.7%
2007	198,493	219,894	418,387	52.6%
2008	176,774	213,493	390,267	54.7%
2009	151,398	184,593	335,992	54.9%
2010	171,363	207,450	378,813	54.8%
2011	169,610	210,521	380,131	55.4%
2012	166,665	216,824	383,489	56.5%
2013	160,445	224,014	384,460	58.3%
2014	151,526	234,242	385,769	60.7%
2015	141,536	244,879	386,415	63.4%
2016	136,103	251,099	387,203	64.8%
2017	128,921	259,003	387,925	66.8%
2018	128,020	261,135	389,155	67.1%
2019	118,120	272,598	390,718	69.8%
2020	109,019	284,337	393,356	72.3%
2021	103,348	292,427	395,775	73.9%
2022	100,897	297,162	398,060	74.7%
2023	100,201	300,074	400,275	75.0%
2024	100,283	302,255	402,538	75.1%
2025	100,690	304,177	404,866	75.1%
2026	101,232	306,036	407,268	75.1%
2027	101,824	307,849	409,674	75.1%
2028	102,442	309,701	412,143	75.1%
2029	103,084	311,574	414,658	75.1%
2030	103,730	313,412	417,142	75.1%

Summ - Program Sector Materials Diversion b ogram
Scenario 31, Recommended Year 2025 Commercial Sector

Material MSW	.	Com Paper Ban Enforce 38	Extend Com Ban 39	Restore Education 41	Plast Film Ban 50	Educati on Audits 43	ABC Ban 22	Latex Paint Prod Stew 42	Ban Clean Wood 45	Total
Aluminum Beverage	BALU	-	539	8	-	0	-	-	-	1,431
Beverage Glass	BGLS	-	1,781	26	-	0	-	-	-	4,578
Construction Debris	CDEB	-	-	-	-	-	-	-	-	-
Container Glass	CGLS	-	128	2	-	0	-	-	-	130
Computer Office Paper	CPO	4,438	-	-	-	-	-	-	-	20,461
Food Cans	FFER	-	604	9	-	0	-	-	-	1,388
Food	FOOD	-	-	-	-	-	-	-	-	64,957
Miscellaneous	MISC	-	-	-	-	-	-	461	-	30,499
Mixed Scrap Paper	MWP	3,391	-	-	-	2	-	-	-	28,590
Newspaper	NP	3,558	-	174	-	-	-	-	-	27,651
Other Paper	NRP	-	-	-	-	-	-	-	-	12,528
Other Aluminum	OALU	-	365	-	-	0	-	-	-	365
Corrugated Kraft	OCC	6,175	-	302	-	4	-	-	-	58,484
Other Ferrous	OFER	-	-	219	-	3	-	-	-	7,164
Other Glass	OGLS	-	-	-	-	-	-	-	-	971
Other NonFerrous	ONFR	-	-	-	-	0	-	-	-	0
Other Organics	OORG	-	-	-	-	-	-	-	-	-
Plastics	PLST	-	3,075	-	-	5	-	-	-	8,241
Wood	WOOD	-	-	510	-	-	-	-	-	510
Yard	YARD	-	-	152	-	-	-	-	-	21,052
Total	..	**17,562**	**6,492**	**1,402**	**-**	**14**	**-**	**461**	**-**	**289,000**

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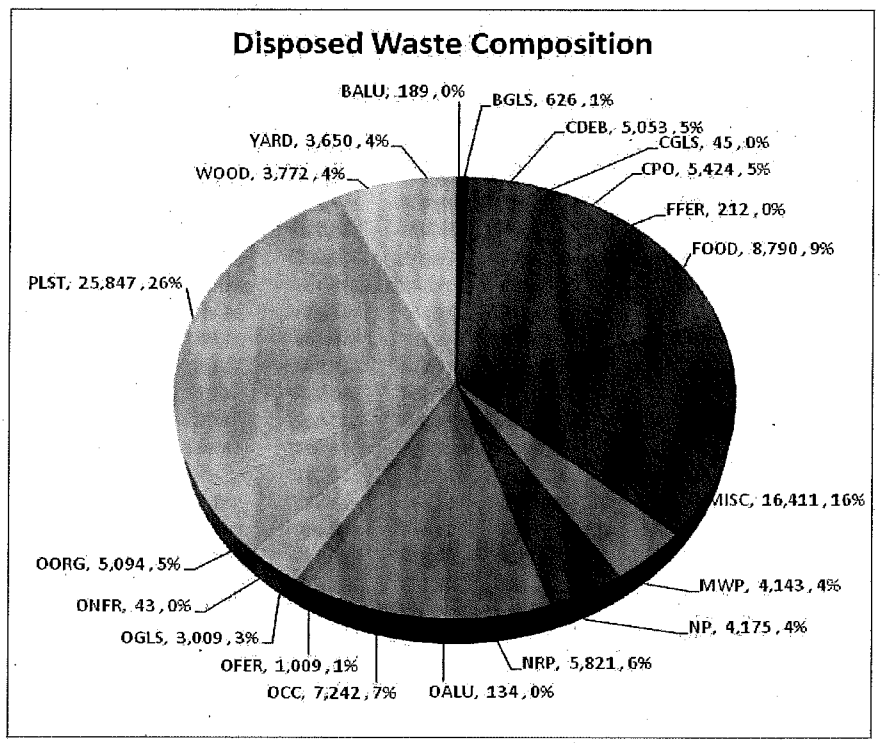

Summary - Program Sector Materials Diversion by Program
Scenario 31, Recommended Year 2025 Self Haul Sector

(in tons per year)

Material MSW	.	Total Disposed 1	Total Recycled 2	Total Generated 3	Percent Recycled (2/3)	Clean Green 21	Drop Sites 23	Carpet 36	Ban Asphalt Shingles 26
Aluminum Beverage	BALU	51	22	73	30.1%	-	4	-	-
Beverage Glass	BGLS	211	610	822	74.3%	-	537	-	-
Construction Debris	CDEB	8,575	13,036	21,611	60.3%	-	-	-	482
Container Glass	CGLS	42	15	57	25.7%	-	-	-	-
Computer Office Paper	CPO	657	173	830	20.8%	-	-	-	-
Food Cans	FFER	48	17	65	25.7%	-	-	-	-
Food	FOOD	2,523	360	2,883	12.5%	-	-	-	-
Miscellaneous	MISC	22,573	1,642	24,215	6.8%	-	63	1,543	-
Mixed Scrap Paper	MWP	1,161	1,093	2,253	48.5%	-	477	-	-
Newspaper	NP	2	386	388	99.4%	-	385	-	-
Other Paper	NRP	1,526	-	1,526	0.0%	-	-	-	-
Other Aluminum	OALU	144	16	160	10.0%	-	-	-	-
Corrugated Kraft	OCC	1,036	2,703	3,739	72.3%	-	1,006	-	-
Other Ferrous	OFER	2,117	7,859	9,976	78.8%	-	5,036	-	-
Other Glass	OGLS	1,733	-	1,733	0.0%	-	-	-	-
Other NonFerrous	ONFR	58	71	129	55.1%	-	-	-	-
Other Organics	OORG	2,857	-	2,857	0.0%	-	-	-	-
Plastics	PLST	6,103	162	6,265	2.6%	-	27	-	-
Wood	WOOD	18,665	18,979	37,644	50.4%	-	244	-	-
Yard	YARD	3,797	14,804	18,601	79.6%	14,081	-	-	-
Total	..	**73,879**	**61,947**	**135,826**	**#N/A**	**14,081**	**7,779**	**1,543**	**482**

Year	Total Disposed 1	Total Recycled 2	Total Generated 3	Percent Recycled (2/3)
1997	97,146	19,137	116,283	16.5%
1998	98,019	18,410	116,429	15.8%
1999	104,367	20,304	124,671	16.3%
2000	101,883	21,141	123,024	17.2%
2001	102,305	22,137	124,442	17.8%
2002	102,891	22,693	125,584	18.1%
2003	101,232	22,325	123,557	18.1%
2004	99,766	23,070	122,836	18.8%
2005	100,499	23,157	123,656	18.7%
2006	103,428	24,022	127,450	18.8%
2007	107,098	25,492	132,591	19.2%
2008	90,673	20,556	111,229	18.5%
2009	81,565	16,328	97,893	16.7%
2010	91,226	18,257	109,484	16.7%
2011	93,001	18,604	111,605	16.7%
2012	95,811	19,216	115,027	16.7%
2013	93,287	24,290	117,576	20.7%
2014	88,120	31,624	119,745	26.4%
2015	81,383	39,988	121,371	32.9%
2016	74,740	48,171	122,911	39.2%
2017	70,736	52,968	123,704	42.8%
2018	69,543	55,774	125,317	44.5%
2019	69,493	57,300	126,794	45.2%
2020	69,949	58,290	128,239	45.5%
2021	70,605	59,069	129,674	45.6%
2022	71,391	59,813	131,204	45.6%
2023	72,209	60,531	132,740	45.6%
2024	73,039	61,239	134,279	45.6%
2025	73,879	61,947	135,826	45.6%
2026	74,718	62,653	137,370	45.6%
2027	75,551	63,352	138,904	45.6%
2028	76,358	64,029	140,387	45.6%
2029	77,149	64,692	141,841	45.6%
2030	77,970	65,381	143,351	45.6%

Summa - Program Sector Materials Diversion b Program
Scenario 31, Recommended Year 2025 Self Haul Sector

Material MSW	.	Floor Sort 50% C&D 29	Restore Education 41	Plast Film Ban 50	Pre Scale Recycle 51	Education Audits 43	Divert Reusea bles 52	ABC Ban 22	Ban Clean Wood 45	Total
Aluminum Beverage	BALU	-	2	-	12	3	-	-	-	22
Beverage Glass	BGLS	-	9	-	50	14	-	-	-	610
Construction Debris	CDEB	7,167	-	-	-	665	-	4,722	-	13,036
Container Glass	CGLS	-	2	-	10	3	-	-	-	15
Computer Office Paper	CPO	-	33	-	-	139	-	-	-	173
Food Cans	FFER	-	2	-	11	3	-	-	-	17
Food	FOOD	-	-	-	-	360	-	-	-	360
Miscellaneous	MISC	-	-	-	-	-	35	-	-	1,642
Mixed Scrap Paper	MWP	-	59	-	311	246	-	-	-	1,093
Newspaper	NP	-	0	-	0	-	-	-	-	386
Other Paper	NRP	-	-	-	-	-	-	-	-	-
Other Aluminum	OALU	-	6	-	-	10	-	-	-	16
Corrugated Kraft	OCC	750	90	-	478	379	-	-	-	2,703
Other Ferrous	OFER	1,533	162	-	860	243	25	-	-	7,859
Other Glass	OGLS	-	-	-	-	-	-	-	-	-
Other NonFerrous	ONFR	42	-	-	23	7	-	-	-	71
Other Organics	OORG	-	-	-	-	-	-	-	-	-
Plastics	PLST	-	-	104	-	31	-	-	-	162
Wood	WOOD	8,925	1,494	-	-	829	47	-	7,439	18,979
Yard	YARD	-	181	-	-	542	-	-	-	14,804
Total	..	**18,417**	**2,041**	**104**	**1,755**	**3,476**	**107**	**4,722**	**7,439**	**61,947**

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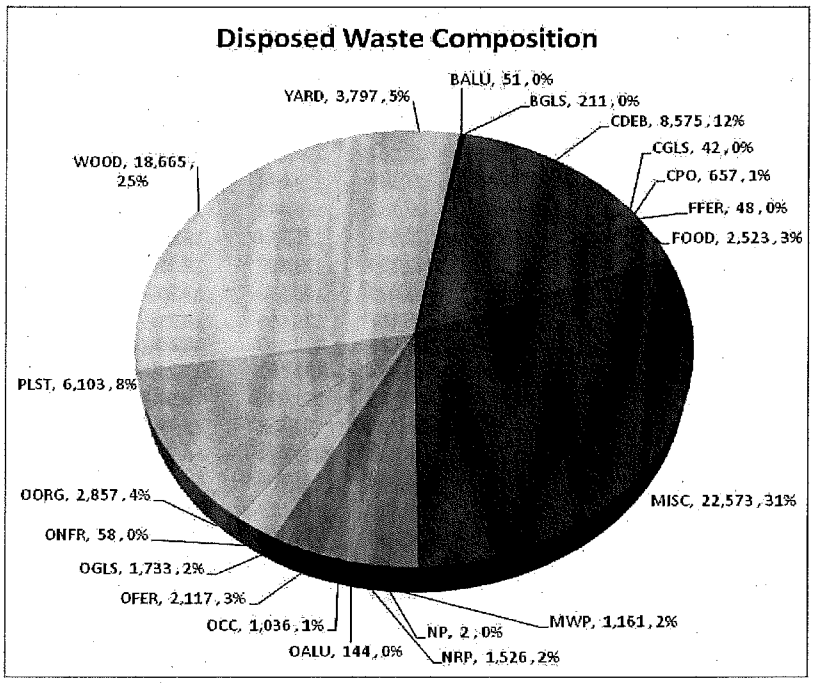

Summary - Recyclir Program Benefits Costs Scenar 31, Recommended

All Programs in Scenario 1/13/2012

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	**$93,144,347**	$116,013	$262,341	$972,064	$2,126,512	$3,988,811
Program Cost	**$74,041,214**	$431,561	$1,194,000	$1,910,605	$2,798,128	$3,973,167
Net Benefits	**$19,103,133**	($315,548)	($931,659)	($938,540)	($671,616)	$15,644
Tons avoided through recycling	**2,492,448**	**1,840**	**4,161**	**11,746**	**26,284**	**48,719**

(All costs in 2010 dollars)

12 Textile Market Dev

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	**$1,594,928**	$0	$0	$0	$0	$0
Program Cost	**$287,692**	$0	$0	$0	$0	$0
Net Benefits	**$1,307,236**	$0	$0	$0	$0	$0
Tons avoided through recycling	**28,596**	-	-	-	-	-
	$46					

13 MF Univer Org Serv

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	**$6,239,071**	$0	$0	$228,037	$418,673	$593,199
Program Cost	**$3,389,494**	$0	$200,000	$212,001	$213,632	$299,351
Net Benefits	**$2,849,577**	$0	($200,000)	$16,036	$205,041	$293,848
Tons avoided through recycling	**94,700**	-	-	**1,647**	**3,024**	**4,285**
	$30					

14 MF Org Ban

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	**$3,599,830**	$0	$0	$0	$0	$0
Program Cost	**$1,981,153**	$0	$0	$0	$0	$135,000
Net Benefits	**$1,618,677**	$0	$0	$0	$0	($135,000)
Tons avoided through recycling	**62,510**	-	-	-	-	-
	$26					

15 Pet Waste & Diapers

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	**$2,938,090**	$0	$0	$0	$0	$0
Program Cost	**$3,534,864**	$0	$0	$0	$0	$0
Net Benefits	**($596,774)**	$0	$0	$0	$0	$0
Tons avoided through recycling	**58,881**	-	-	-	-	-
	($10)					

16 Plast Bag Ban Res

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	**$520,976**	$0	$0	$0	$0	$0
Program Cost	**($733,543)**	$0	$0	$0	$0	$0
Net Benefits	**$1,254,519**	$0	$0	$0	$0	$0
Tons avoided through recycling	**8,609**	-	-	-	-	-
	$146					

18 SF Org Ban

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	**$13,414,355**	$0	$0	$0	$0	$260,454
Program Cost	**$11,470,744**	$0	$0	$0	$90,000	$241,043
Net Benefits	**$1,943,612**	$0	$0	$0	($90,000)	$19,411
Tons avoided through recycling	**219,771**	-	-	-	-	**1,881**
	$9					

19 Incr Res Ban Enforce

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	**$9,051,551**	$0	$0	$145,663	$321,920	$586,320
Program Cost	**$3,277,034**	$0	$50,000	$108,064	$158,998	$235,380
Net Benefits	**$5,774,517**	$0	($50,000)	$37,599	$162,921	$350,940
Tons avoided through recycling	**141,049**	-	-	**1,052**	**2,325**	**4,235**
	$41					

20 Reuse Bag Res

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	**$90,348**	$0	$0	$0	$0	$1,346
Program Cost	**$200,307**	$0	$0	$0	$0	$25,000
Net Benefits	**($109,959)**	$0	$0	$0	$0	($23,654)
Tons avoided through recycling	**1,498**	-	-	-	-	**10**
	($73)					

Summary - Recycli Program Benefits Costs Scena 31, Recommended

All Programs in Scenario

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$6,018,053	$7,732,125	$9,291,304	$10,108,935	$11,240,107	$12,200,744
Program Cost	$5,016,887	$5,630,296	$6,374,595	$7,275,358	$8,620,722	$9,035,307
Net Benefits	$1,001,166	$2,101,830	$2,916,709	$2,833,577	$2,619,385	$3,165,437
Tons avoided through recycling	**73,379**	**93,306**	**111,237**	**119,349**	**134,011**	**146,972**

(All costs in 2010 dollars)

12 Textile Market Dev

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$0	$11,995	$30,741	$70,891	$137,975	$216,397
Program Cost	$75,000	$100,000	$60,000	$35,000	$25,000	$25,000
Net Benefits	($75,000)	($88,005)	($29,259)	$35,891	$112,975	$191,397
Tons avoided through recycling	**-**	**87**	**222**	**512**	**997**	**1,563**

13 MF Univer Org Serv

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$677,821	$695,942	$699,378	$698,591	$699,429	$702,868
Program Cost	$340,913	$349,813	$351,501	$351,114	$351,526	$353,215
Net Benefits	$336,908	$346,129	$347,877	$347,476	$347,903	$349,653
Tons avoided through recycling	**4,896**	**5,027**	**5,051**	**5,046**	**5,052**	**5,077**

14 MF Org Ban

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$35,281	$81,480	$176,832	$323,021	$469,985	$567,753
Program Cost	$97,328	$48,019	$94,851	$166,653	$238,834	$286,853
Net Benefits	($62,047)	$33,461	$81,981	$156,369	$231,151	$280,900
Tons avoided through recycling	**255**	**589**	**1,277**	**2,333**	**3,395**	**4,101**

15 Pet Waste & Diapers

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$0	$0	$0	$0	$0	$22,076
Program Cost	$0	$0	$0	$0	$345,000	$39,679
Net Benefits	$0	$0	$0	$0	($345,000)	($17,603)
Tons avoided through recycling	**-**	**-**	**-**	**-**	**-**	**159**

16 Plast Bag Ban Res

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$21,465	$39,909	$58,899	$70,870	$76,481	$78,797
Program Cost	($100,000)	($100,000)	($100,000)	($100,000)	($100,000)	($100,000)
Net Benefits	$121,465	$139,909	$158,899	$170,870	$176,481	$178,797
Tons avoided through recycling	**155**	**288**	**425**	**512**	**552**	**569**

18 SF Org Ban

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$569,524	$1,044,600	$1,533,082	$1,835,049	$1,972,062	$2,023,274
Program Cost	$483,344	$886,533	$1,301,099	$1,557,373	$1,673,653	$1,717,116
Net Benefits	$86,179	$158,067	$231,983	$277,676	$298,409	$306,158
Tons avoided through recycling	**4,114**	**7,545**	**11,073**	**13,254**	**14,244**	**14,614**

19 Incr Res Ban Enforce

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$842,646	$1,006,795	$1,095,267	$1,127,063	$1,137,923	$1,142,668
Program Cost	$309,372	$356,693	$382,177	$391,237	$394,262	$395,519
Net Benefits	$533,274	$650,101	$713,090	$735,826	$743,661	$747,149
Tons avoided through recycling	**6,086**	**7,272**	**7,911**	**8,141**	**8,219**	**8,253**

20 Reuse Bag Res

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$3,082	$5,948	$9,292	$11,797	$13,166	$13,777
Program Cost	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000
Net Benefits	($21,918)	($19,052)	($15,708)	($13,203)	($11,834)	($11,223)
Tons avoided through recycling	**22**	**43**	**67**	**85**	**95**	**100**

Summary - Recyclir Program Benefits Costs Scenar 31, Recommended

All Programs in Scenario

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$12,880,873	$13,333,450	$13,734,561	$14,175,003	$14,596,232	$14,911,114
Program Cost	$9,714,416	$10,114,484	$10,498,902	$10,880,129	$11,278,861	$11,490,449
Net Benefits	$3,166,457	$3,218,966	$3,235,658	$3,294,874	$3,317,371	$3,420,666
Tons avoided through recycling	**155,856**	**161,282**	**165,350**	**169,287**	**172,926**	**175,743**

(All costs in 2010 dollars)

12 Textile Market Dev

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$281,276	$319,996	$339,693	$349,856	$356,078	$360,719
Program Cost	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000
Net Benefits	$256,276	$294,996	$314,693	$324,856	$331,078	$335,719
Tons avoided through recycling	**2,032**	**2,311**	**2,454**	**2,527**	**2,572**	**2,605**

13 MF Univer Org Serv

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$713,784	$725,135	$737,150	$749,515	$762,220	$775,030
Program Cost	$408,576	$364,152	$370,053	$376,126	$382,366	$388,657
Net Benefits	$305,207	$360,983	$367,097	$373,389	$379,854	$386,372
Tons avoided through recycling	**5,156**	**5,238**	**5,324**	**5,414**	**5,505**	**5,598**

14 MF Org Ban

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$623,040	$652,310	$670,669	$684,788	$697,475	$709,602
Program Cost	$314,007	$328,384	$337,401	$384,335	$350,566	$356,522
Net Benefits	$309,032	$323,927	$333,269	$300,453	$346,909	$353,079
Tons avoided through recycling	**4,500**	**4,712**	**4,844**	**4,946**	**5,038**	**5,125**

15 Pet Waste & Diapers

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$57,821	$145,244	$328,919	$614,978	$905,070	$1,097,753
Program Cost	$117,145	$172,381	$377,643	$697,123	$1,020,801	$1,235,419
Net Benefits	($59,324)	($27,138)	($48,724)	($82,145)	($115,731)	($137,666)
Tons avoided through recycling	**418**	**1,049**	**2,376**	**4,442**	**6,537**	**7,929**

16 Plast Bag Ban Res

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$80,427	$81,507	$82,426	$83,289	$84,147	$84,991
Program Cost	($100,000)	($100,000)	($100,000)	($100,000)	($100,000)	($100,000)
Net Benefits	$180,427	$181,507	$182,426	$183,289	$184,147	$184,991
Tons avoided through recycling	**581**	**589**	**595**	**602**	**608**	**614**

18 SF Org Ban

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$2,056,354	$2,075,009	$2,089,326	$2,101,983	$2,114,270	$2,126,024
Program Cost	$1,745,190	$1,761,023	$1,793,173	$1,783,915	$1,794,343	$1,804,318
Net Benefits	$311,164	$313,987	$296,153	$318,068	$319,928	$321,706
Tons avoided through recycling	**14,853**	**14,987**	**15,091**	**15,182**	**15,271**	**15,356**

19 Incr Res Ban Enforce

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$1,155,518	$1,167,440	$1,179,721	$1,192,194	$1,204,964	$1,217,705
Program Cost	$399,110	$402,431	$405,853	$409,327	$412,884	$416,430
Net Benefits	$756,407	$765,009	$773,868	$782,867	$792,080	$801,275
Tons avoided through recycling	**8,346**	**8,432**	**8,521**	**8,611**	**8,703**	**8,795**

20 Reuse Bag Res

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$14,149	$14,369	$14,538	$14,690	$14,837	$14,980
Program Cost	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000
Net Benefits	($10,851)	($10,631)	($10,462)	($10,310)	($10,163)	($10,020)
Tons avoided through recycling	**102**	**104**	**105**	**106**	**107**	**108**

Summary - Recycli Program Benefits Costs Scena 31, Recommended

All Programs in Scenario

Year	2027	2028	2029	2030
Program Benefits	$15,127,302	$15,292,710	$15,437,208	$15,577,702
Program Cost	$11,767,100	$11,785,818	$11,899,828	$11,979,021
Net Benefits	$3,360,203	$3,506,892	$3,537,380	$3,598,681
Tons avoided through recycling	**177,821**	**179,523**	**181,068**	**182,586**

(All costs in 2010 dollars)

12 Textile Market Dev

Year	2027	2028	2029	2030
Program Benefits	$364,793	$368,789	$372,828	$377,085
Program Cost	$25,000	$25,000	$25,000	$25,000
Net Benefits	$339,793	$343,789	$347,828	$352,085
Tons avoided through recycling	**2,635**	**2,664**	**2,693**	**2,724**

13 MF Univer Org Serv

Year	2027	2028	2029	2030
Program Benefits	$788,021	$801,443	$815,257	$829,741
Program Cost	$395,038	$401,630	$408,415	$415,529
Net Benefits	$392,983	$399,813	$406,842	$414,212
Tons avoided through recycling	**5,692**	**5,789**	**5,888**	**5,993**

14 MF Org Ban

Year	2027	2028	2029	2030
Program Benefits	$721,648	$733,996	$746,669	$759,942
Program Cost	$362,439	$368,504	$374,728	$381,247
Net Benefits	$359,209	$365,492	$371,941	$378,695
Tons avoided through recycling	**5,212**	**5,302**	**5,393**	**5,489**

15 Pet Waste & Diapers

Year	2027	2028	2029	2030
Program Benefits	$1,195,242	$1,240,905	$1,264,347	$1,279,678
Program Cost	$1,343,601	$1,393,871	$1,439,312	$1,435,686
Net Benefits	($148,359)	($152,965)	($174,965)	($156,007)
Tons avoided through recycling	**8,633**	**8,963**	**9,132**	**9,243**

16 Plast Bag Ban Res

Year	2027	2028	2029	2030
Program Benefits	$85,838	$86,718	$87,625	$88,591
Program Cost	($100,000)	($100,000)	($100,000)	($100,000)
Net Benefits	$185,838	$186,718	$187,625	$188,591
Tons avoided through recycling	**620**	**626**	**633**	**640**

18 SF Org Ban

Year	2027	2028	2029	2030
Program Benefits	$2,137,634	$2,149,829	$2,162,505	$2,176,368
Program Cost	$1,814,171	$1,824,521	$1,835,278	$1,847,044
Net Benefits	$323,463	$325,308	$327,226	$329,324
Tons avoided through recycling	**15,440**	**15,528**	**15,619**	**15,720**

19 Incr Res Ban Enforce

Year	2027	2028	2029	2030
Program Benefits	$1,230,553	$1,243,900	$1,257,678	$1,272,305
Program Cost	$420,004	$423,718	$427,554	$444,131
Net Benefits	$810,549	$820,181	$830,124	$828,174
Tons avoided through recycling	**8,888**	**8,984**	**9,084**	**9,190**

20 Reuse Bag Res

Year	2027	2028	2029	2030
Program Benefits	$15,123	$15,271	$15,425	$15,588
Program Cost	$25,000	$25,000	$25,000	$25,000
Net Benefits	($9,877)	($9,729)	($9,575)	($9,412)
Tons avoided through recycling	**109**	**110**	**111**	**113**

Summary - Recyclir Program Benefits Costs Scenar 31, Recommended

22 ABC Ban

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	**$2,308,287**	$0	$0	$0	$88,349	$166,598
Program Cost	**$831,746**	$0	$0	$10,000	$48,025	$72,846
Net Benefits	**$1,476,541**	$0	$0	($10,000)	$40,324	$93,751
Tons avoided through recycling	**78,424**	-	-	-	**1,401**	**2,642**
	$19					

26 Ban Asphalt Shingles

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	**$230,189**	$0	$0	$0	$32,575	$34,977
Program Cost	**$201,298**	$0	$0	$0	$26,142	$27,333
Net Benefits	**$28,892**	$0	$0	$0	$6,433	$7,645
Tons avoided through recycling	**9,218**	-	-	-	**646**	**693**
	$3					

29 Floor Sort 50% C&D

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	**$6,355,579**	$0	$0	$0	$111,795	$248,965
Program Cost	**$13,152,521**	$0	$0	$100,000	$332,516	$590,815
Net Benefits	**($6,796,942)**	$0	$0	($100,000)	($220,721)	($341,849)
Tons avoided through recycling	**279,558**	-	-	-	**2,216**	**4,935**
	($24)					

32 Ban Com Org

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	**$7,910,477**	$0	$0	$0	$0	$0
Program Cost	**$9,563,565**	$0	$0	$0	$0	$0
Net Benefits	**($1,653,087)**	$0	$0	$0	$0	$0
Tons avoided through recycling	**307,598**	-	-	-	-	-
	($5)					

35 Foodware Rec/Comp

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	**$9,168,490**	$116,013	$262,341	$491,371	$719,876	$869,762
Program Cost	**$11,190,220**	$431,561	$597,500	$857,225	$826,354	$996,328
Net Benefits	**($2,021,729)**	($315,548)	($335,159)	($365,854)	($106,478)	($126,566)
Tons avoided through recycling	**296,758**	**1,840**	**4,161**	**7,793**	**11,418**	**13,795**
	($7)					

36 Carpet

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	**$726,189**	$0	$0	$5,845	$14,937	$34,218
Program Cost	**$125,119**	$0	$0	$50,000	$50,000	$50,000
Net Benefits	**$601,070**	$0	$0	($44,155)	($35,063)	($15,782)
Tons avoided through recycling	**24,962**	-	-	**93**	**237**	**543**
	$24					

37 Enhanc Com Org

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	**$277,278**	$0	$0	$0	$58,981	$127,345
Program Cost	**$490,601**	$0	$0	$95,000	$149,605	$180,805
Net Benefits	**($213,323)**	$0	$0	($95,000)	($90,624)	($53,461)
Tons avoided through recycling	**6,625**	-	-	-	**935**	**2,020**
	($32)					

38 Enhance Com Paper Ban Enforce

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	**$7,670,922**	$0	$0	$49,837	$125,637	$284,447
Program Cost	**($429,133)**	$0	$62,500	$61,649	$50,468	$27,044
Net Benefits	**$8,100,056**	$0	($62,500)	($11,812)	$75,169	$257,403
Tons avoided through recycling	**268,793**	-	-	**790**	**1,993**	**4,511**
	$30					

39 Extend Com Ban

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	**$2,568,181**	$0	$0	$0	$0	$46,190
Program Cost	**$58,214**	$0	$0	$0	$0	$133,187
Net Benefits	**$2,509,967**	$0	$0	$0	$0	($86,996)
Tons avoided through recycling	**92,689**	-	-	-	-	**733**
	$27					

Summary - Recycli Program Benefits Costs Scena 31, Recommended

22 ABC Ban

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$246,094	$299,355	$325,260	$269,741	$276,059	$280,392
Program Cost	$98,063	$114,958	$123,175	$90,564	$92,568	$93,943
Net Benefits	$148,031	$184,397	$202,084	$179,177	$183,490	$186,449
Tons avoided through recycling	**3,903**	**4,748**	**5,159**	**4,278**	**4,378**	**4,447**

26 Ban Asphalt Shingles

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$31,684	$27,368	$24,501	$23,372	$23,052	$23,084
Program Cost	$25,701	$23,562	$22,141	$21,582	$21,423	$21,439
Net Benefits	$5,983	$3,806	$2,360	$1,790	$1,629	$1,645
Tons avoided through recycling	**628**	**542**	**486**	**463**	**457**	**458**

29 Floor Sort 50% C&D

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$452,080	$641,490	$760,225	$823,276	$854,456	$872,429
Program Cost	$973,290	$1,329,959	$1,553,544	$1,672,272	$1,730,986	$1,764,831
Net Benefits	($521,210)	($688,469)	($793,319)	($848,996)	($876,530)	($892,401)
Tons avoided through recycling	**8,961**	**12,715**	**15,069**	**16,319**	**16,937**	**17,293**

32 Ban Com Org

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$0	$77,806	$195,007	$440,365	$820,744	$1,209,317
Program Cost	$165,000	$267,864	$285,214	$560,287	$989,836	$1,428,636
Net Benefits	($165,000)	($190,057)	($90,207)	($119,923)	($169,091)	($219,319)
Tons avoided through recycling	**-**	**1,234**	**3,093**	**6,984**	**13,017**	**19,180**

35 Foodware Rec/Comp

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$942,005	$972,696	$985,344	$992,220	$997,320	$1,006,719
Program Cost	$1,078,253	$1,113,057	$1,127,400	$1,135,198	$1,140,982	$1,151,640
Net Benefits	($136,248)	($140,361)	($142,056)	($142,978)	($143,661)	($144,921)
Tons avoided through recycling	**14,941**	**15,427**	**15,628**	**15,737**	**15,818**	**15,967**

36 Carpet

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$64,362	$95,171	$115,378	$85,477	$89,190	$91,256
Program Cost	$10,000	$10,000	$10,000	$0	$0	$0
Net Benefits	$54,362	$85,171	$105,378	$85,477	$89,190	$91,256
Tons avoided through recycling	**1,021**	**1,509**	**1,830**	**1,356**	**1,415**	**1,447**

37 Enhanc Com Org

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$231,411	$0	$0	$0	$0	$0
Program Cost	$296,324	$0	$0	$0	$0	$0
Net Benefits	($64,913)	$0	$0	$0	$0	$0
Tons avoided through recycling	**3,670**	**-**	**-**	**-**	**-**	**-**

38 Enhance Com Paper Ban Enfor

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$529,783	$776,181	$936,894	$1,016,419	$1,052,028	$1,071,324
Program Cost	($9,144)	($45,488)	($69,194)	($80,924)	($86,176)	($89,022)
Net Benefits	$538,927	$821,669	$1,006,088	$1,097,343	$1,138,204	$1,160,346
Tons avoided through recycling	**8,403**	**12,311**	**14,860**	**16,121**	**16,686**	**16,992**

39 Extend Com Ban

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$104,365	$194,471	$285,008	$344,648	$374,420	$389,036
Program Cost	$74,606	$11,315	($2,039)	($10,836)	($15,228)	($17,384)
Net Benefits	$29,759	$183,155	$287,047	$355,485	$389,647	$406,419
Tons avoided through recycling	**1,655**	**3,084**	**4,520**	**5,466**	**5,938**	**6,170**

Summary - Recyclir Program Benefits Costs Scenar 31, Recommended

22 ABC Ban

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$283,973	$287,489	$290,917	$294,312	$297,712	$301,100
Program Cost	$95,079	$96,194	$97,281	$98,358	$99,437	$100,511
Net Benefits	$188,894	$191,295	$193,636	$195,953	$198,275	$200,588
Tons avoided through recycling	**4,504**	**4,560**	**4,614**	**4,668**	**4,722**	**4,776**

26 Ban Asphalt Shingles

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$23,256	$23,498	$23,761	$24,032	$24,307	$24,583
Program Cost	$21,524	$21,644	$21,774	$21,909	$22,045	$22,182
Net Benefits	$1,732	$1,854	$1,986	$2,123	$2,262	$2,401
Tons avoided through recycling	**461**	**466**	**471**	**476**	**482**	**487**

29 Floor Sort 50% C&D

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$885,288	$896,889	$907,823	$918,504	$929,149	$939,735
Program Cost	$1,789,043	$1,910,889	$1,831,478	$1,851,591	$1,871,637	$1,891,570
Net Benefits	($903,755)	($1,014,000)	($923,655)	($933,087)	($942,488)	($951,835)
Tons avoided through recycling	**17,548**	**17,778**	**17,995**	**18,206**	**18,417**	**18,627**

32 Ban Com Org

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$1,465,540	$1,593,043	$1,649,899	$1,676,297	$1,690,482	$1,700,269
Program Cost	$1,717,980	$1,861,964	$1,926,169	$1,955,979	$2,046,998	$1,983,050
Net Benefits	($252,439)	($268,921)	($276,270)	($279,682)	($356,516)	($282,781)
Tons avoided through recycling	**23,244**	**25,266**	**26,168**	**26,587**	**26,812**	**26,967**

35 Foodware Rec/Comp

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$1,012,267	$1,017,439	$1,022,319	$1,027,274	$1,032,327	$1,037,579
Program Cost	$1,157,932	$1,163,796	$1,169,331	$1,174,950	$1,180,681	$1,186,636
Net Benefits	($145,665)	($146,358)	($147,012)	($147,676)	($148,353)	($149,057)
Tons avoided through recycling	**16,055**	**16,137**	**16,214**	**16,293**	**16,373**	**16,456**

36 Carpet

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$92,674	$93,916	$95,071	$96,194	$97,310	$98,419
Program Cost	$0	$0	$0	$0	$0	$0
Net Benefits	$92,674	$93,916	$95,071	$96,194	$97,310	$98,419
Tons avoided through recycling	**1,470**	**1,490**	**1,508**	**1,526**	**1,543**	**1,561**

37 Enhanc Com Org

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$0	$0	$0	$0	$0	$0
Program Cost	$0	$0	$0	$0	$0	$0
Net Benefits	$0	$0	$0	$0	$0	$0
Tons avoided through recycling	**-**	**-**	**-**	**-**	**-**	**-**

38 Enhance Com Paper Ban Enfor

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$1,081,746	$1,089,206	$1,095,400	$1,101,313	$1,107,282	$1,113,391
Program Cost	($90,560)	($91,660)	($92,574)	($93,446)	($94,326)	($95,227)
Net Benefits	$1,172,306	$1,180,866	$1,187,974	$1,194,759	$1,201,608	$1,208,619
Tons avoided through recycling	**17,157**	**17,275**	**17,374**	**17,467**	**17,562**	**17,659**

39 Extend Com Ban

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$396,205	$400,488	$403,665	$406,522	$409,316	$412,132
Program Cost	($18,441)	($19,073)	($19,541)	$20,037	($20,375)	($20,790)
Net Benefits	$414,646	$419,561	$423,206	$386,485	$429,691	$432,922
Tons avoided through recycling	**6,284**	**6,352**	**6,402**	**6,448**	**6,492**	**6,537**

Summary - Recycli Program Benefits Costs Scena 31, Recommended

22 ABC Ban

Year	2027	2028	2029	2030
Program Benefits	$304,462	$307,714	$310,902	$314,210
Program Cost	$101,578	$102,609	$103,621	$104,670
Net Benefits	$202,884	$205,104	$207,281	$209,540
Tons avoided through recycling	**4,829**	**4,880**	**4,931**	**4,984**

26 Ban Asphalt Shingles

Year	2027	2028	2029	2030
Program Benefits	$24,857	$25,122	$25,382	$25,652
Program Cost	$22,318	$22,449	$22,578	$22,712
Net Benefits	$2,539	$2,673	$2,804	$2,941
Tons avoided through recycling	**493**	**498**	**503**	**508**

29 Floor Sort 50% C&D

Year	2027	2028	2029	2030
Program Benefits	$950,233	$960,384	$970,334	$980,660
Program Cost	$1,911,339	$1,930,454	$1,949,189	$1,968,634
Net Benefits	($961,106)	($970,070)	($978,856)	($987,974)
Tons avoided through recycling	**18,835**	**19,036**	**19,234**	**19,438**

32 Ban Com Org

Year	2027	2028	2029	2030
Program Benefits	$1,707,975	$1,715,690	$1,722,742	$1,728,883
Program Cost	$1,991,753	$2,000,464	$2,008,428	$2,015,363
Net Benefits	($283,777)	($284,774)	($285,686)	($286,480)
Tons avoided through recycling	**27,089**	**27,212**	**27,323**	**27,421**

35 Foodware Rec/Comp

Year	2027	2028	2029	2030
Program Benefits	$1,042,936	$1,048,558	$1,054,300	$1,059,908
Program Cost	$1,192,711	$1,199,086	$1,205,597	$1,211,957
Net Benefits	($149,775)	($150,528)	($151,298)	($152,049)
Tons avoided through recycling	**16,541**	**16,631**	**16,722**	**16,811**

36 Carpet

Year	2027	2028	2029	2030
Program Benefits	$99,519	$100,582	$101,624	$102,706
Program Cost	$0	$0	$0	$0
Net Benefits	$99,519	$100,582	$101,624	$102,706
Tons avoided through recycling	**1,578**	**1,595**	**1,612**	**1,629**

37 Enhanc Com Org

Year	2027	2028	2029	2030
Program Benefits	$0	$0	$0	$0
Program Cost	$0	$0	$0	$0
Net Benefits	$0	$0	$0	$0
Tons avoided through recycling	**-**	**-**	**-**	**-**

38 Enhance Com Paper Ban Enfor

Year	2027	2028	2029	2030
Program Benefits	$1,119,540	$1,125,893	$1,132,356	$1,138,703
Program Cost	($96,134)	($97,071)	($98,025)	($98,961)
Net Benefits	$1,215,674	$1,222,965	$1,230,381	$1,237,664
Tons avoided through recycling	**17,756**	**17,857**	**17,960**	**18,060**

39 Extend Com Ban

Year	2027	2028	2029	2030
Program Benefits	$414,974	$417,872	$420,874	$423,879
Program Cost	($21,210)	($21,637)	($22,080)	($22,523)
Net Benefits	$436,184	$439,509	$442,953	$446,402
Tons avoided through recycling	**6,582**	**6,628**	**6,675**	**6,723**

Summary - Recyclir Program Benefits Costs Scenar 31, Recommended

41 Restore Education

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	**$3,838,317**	$0	$0	$0	$71,854	$157,914
Program Cost	**$4,734,109**	$0	$0	$300,000	$589,387	$574,752
Net Benefits	**($895,791)**	$0	$0	($300,000)	($517,534)	($416,838)
Tons avoided through recycling	**61,311**	-	-	-	**519**	**1,141**
	($15)					

42 Latex Paint Prod Stew

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	**$717,130**	$0	$0	$0	$0	$0
Program Cost	**$18,000**	$0	$0	$0	$0	$0
Net Benefits	**$699,130**	$0	$0	$0	$0	$0
Tons avoided through recycling	**11,872**	-	-	-	-	-
	$59					

43 New Education - Com

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	**$1,501,482**	$0	$0	$0	$25,251	$57,196
Program Cost	**($341,914)**	$0	$0	$0	$92,333	$63,660
Net Benefits	**$1,843,395**	$0	$0	$0	($67,082)	($6,463)
Tons avoided through recycling	**52,883**	-	-	-	**400**	**907**
	$35					

44 Phone & Junk Opt Out

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	**$3,410,079**	$0	$0	$51,311	$115,481	$214,916
Program Cost	**$1,245,287**	$0	$284,000	$116,666	$100,666	$83,266
Net Benefits	**$2,164,791**	$0	($284,000)	($65,355)	$14,815	$131,650
Tons avoided through recycling	**53,068**	-	-	**371**	**834**	**1,552**
	$41					

45 Ban Clean Wood

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	**$3,868,789**	$0	$0	$0	$0	$265,990
Program Cost	**$2,367,728**	$0	$0	$0	$10,000	$177,358
Net Benefits	**$1,501,061**	$0	$0	$0	($10,000)	$88,632
Tons avoided through recycling	**130,015**	-	-	-	-	**4,219**
	$12					

46 Com C&D Ban

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	**$4,388,718**	$0	$0	$0	$0	$0
Program Cost	**$5,846,353**	$0	$0	$0	$0	$0
Net Benefits	**($1,457,634)**	$0	$0	$0	$0	$0
Tons avoided through recycling	**172,010**	-	-	-	-	-
	($8)					

50 Plast Film Ban

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	**$194,859**	$0	$0	$0	$21,184	$38,973
Program Cost	**$92,767**	$0	$0	$0	$60,000	$60,000
Net Benefits	**$102,093**	$0	$0	$0	($38,816)	($21,027)
Tons avoided through recycling	**5,351**	-	-	-	**336**	**618**
	$19					

51 Pre Scale Recycle

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	**$527,198**	$0	$0	$0	$0	$0
Program Cost	**$1,479,653**	$0	$0	$0	$0	$0
Net Benefits	**($952,455)**	$0	$0	$0	$0	$0
Tons avoided through recycling	**24,194**	-	-	-	-	-
	($39)					

52 Divert Reuseables

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	**$33,032**	$0	$0	$0	$0	$0
Program Cost	**$7,335**	$0	$0	$0	$0	$0
Net Benefits	**$25,696**	$0	$0	$0	$0	$0
Tons avoided through recycling	**1,503**	-	-	-	-	-
	$17					

Summary - Recycli Program Benefits Costs Scena 31, Recommended

41 Restore Education

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$282,982	$397,322	$466,760	$500,552	$516,215	$524,704
Program Cost	$551,123	$528,028	$513,360	$505,488	$501,571	$499,325
Net Benefits	($268,140)	($130,705)	($46,600)	($4,936)	$14,645	$25,380
Tons avoided through recycling	**2,044**	**2,870**	**3,371**	**3,615**	**3,729**	**3,790**

42 Latex Paint Prod Stew

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$28,924	$54,024	$79,638	$96,407	$104,724	$108,531
Program Cost	$7,500	$7,500	$7,500	$7,500	$0	$0
Net Benefits	$21,424	$46,524	$72,138	$88,907	$104,724	$108,531
Tons avoided through recycling	**209**	**390**	**575**	**696**	**756**	**784**

43 New Education - Com

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$106,036	$151,093	$179,793	$194,889	$202,310	$206,576
Program Cost	$19,839	($20,538)	($46,181)	($59,608)	($66,189)	($69,977)
Net Benefits	$86,198	$171,632	$225,974	$254,497	$268,498	$276,553
Tons avoided through recycling	**1,682**	**2,396**	**2,852**	**3,091**	**3,209**	**3,276**

44 Phone & Junk Opt Out

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$315,807	$383,543	$421,062	$433,660	$437,043	$437,461
Program Cost	$183,266	$83,266	$83,266	$83,266	$183,266	$83,266
Net Benefits	$132,541	$300,277	$337,796	$350,394	$253,777	$354,195
Tons avoided through recycling	**2,281**	**2,770**	**3,041**	**3,132**	**3,157**	**3,160**

45 Ban Clean Wood

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$475,172	$666,444	$780,351	$420,299	$433,179	$441,113
Program Cost	$301,109	$409,264	$476,651	$253,646	$261,266	$265,960
Net Benefits	$174,063	$257,180	$303,700	$166,652	$171,913	$175,153
Tons avoided through recycling	**7,536**	**10,570**	**12,377**	**6,666**	**6,870**	**6,996**

46 Com C&D Ban

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$0	$0	$0	$248,128	$462,739	$677,892
Program Cost	$0	$0	$70,000	$410,156	$660,443	$911,374
Net Benefits	$0	$0	($70,000)	($162,028)	($197,704)	($233,482)
Tons avoided through recycling	**-**	**-**	**-**	**3,935**	**7,339**	**10,752**

50 Plast Film Ban

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$56,231	$66,374	$70,280	$5,959	$6,097	$6,193
Program Cost	$10,000	$5,000	$0	$0	$0	$0
Net Benefits	$46,231	$61,374	$70,280	$5,959	$6,097	$6,193
Tons avoided through recycling	**892**	**1,053**	**1,115**	**95**	**97**	**98**

51 Pre Scale Recycle

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$0	$39,674	$58,713	$71,852	$78,707	$82,098
Program Cost	$0	$125,490	$104,129	$259,390	$251,699	$247,894
Net Benefits	$0	($85,816)	($45,416)	($187,538)	($172,992)	($165,796)
Tons avoided through recycling	**-**	**786**	**1,164**	**1,424**	**1,560**	**1,627**

52 Divert Reuseables

Year	2015	2016	2017	2018	2019	2020
Program Benefits	$1,299	$2,445	$3,598	$4,391	$4,805	$5,010
Program Cost	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000
Net Benefits	$299	$1,445	$2,598	$3,391	$3,805	$4,010
Tons avoided through recycling	**26**	**48**	**71**	**87**	**95**	**99**

Summary - Recyclir Program Benefits Costs Scenar 31, Recommended

41 Restore Education

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$531,568	$537,510	$543,123	$548,669	$554,264	$559,881
Program Cost	$497,880	$496,602	$495,423	$494,278	$493,142	$492,010
Net Benefits	$33,688	$40,907	$47,700	$54,391	$61,122	$67,871
Tons avoided through recycling	**3,839**	**3,882**	**3,923**	**3,963**	**4,003**	**4,044**

42 Latex Paint Prod Stew

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$110,879	$112,473	$113,822	$115,114	$116,429	$117,755
Program Cost	$0	$0	$0	$0	$0	$0
Net Benefits	$110,879	$112,473	$113,822	$115,114	$116,429	$117,755
Tons avoided through recycling	**801**	**812**	**822**	**831**	**841**	**851**

43 New Education - Com

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$209,622	$212,366	$214,951	$217,476	$219,993	$222,495
Program Cost	($72,692)	($75,147)	($77,463)	($79,726)	($81,983)	($84,226)
Net Benefits	$282,314	$287,514	$292,414	$297,203	$301,975	$306,721
Tons avoided through recycling	**3,325**	**3,368**	**3,409**	**3,449**	**3,489**	**3,529**

44 Phone & Junk Opt Out

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$440,720	$443,498	$446,339	$449,199	$452,125	$454,996
Program Cost	$83,266	$83,266	$183,266	$83,266	$83,266	$83,266
Net Benefits	$357,454	$360,232	$263,073	$365,933	$368,859	$371,730
Tons avoided through recycling	**3,183**	**3,203**	**3,224**	**3,244**	**3,266**	**3,286**

45 Ban Clean Wood

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$447,169	$452,863	$458,321	$463,691	$469,056	$474,397
Program Cost	$269,543	$272,911	$276,140	$279,317	$282,491	$285,650
Net Benefits	$177,627	$179,952	$182,181	$184,374	$186,565	$188,747
Tons avoided through recycling	**7,092**	**7,183**	**7,269**	**7,354**	**7,439**	**7,524**

46 Com C&D Ban

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$822,218	$894,866	$928,529	$945,742	$956,882	$965,894
Program Cost	$1,083,055	$1,169,471	$1,209,516	$1,229,991	$1,243,242	$1,253,962
Net Benefits	($260,837)	($274,606)	($280,986)	($284,249)	($286,360)	($288,068)
Tons avoided through recycling	**13,041**	**14,193**	**14,727**	**15,000**	**15,177**	**15,319**

50 Plast Film Ban

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$6,272	$6,349	$6,425	$6,500	$6,575	$6,650
Program Cost	$0	$0	$0	$0	$0	$0
Net Benefits	$6,272	$6,349	$6,425	$6,500	$6,575	$6,650
Tons avoided through recycling	**99**	**101**	**102**	**103**	**104**	**105**

51 Pre Scale Recycle

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$83,984	$85,341	$86,477	$87,530	$88,558	$89,572
Program Cost	$245,778	$244,256	$242,981	$241,800	$240,647	$239,509
Net Benefits	($161,794)	($158,915)	($156,504)	($154,269)	($152,089)	($149,937)
Tons avoided through recycling	**1,665**	**1,692**	**1,714**	**1,735**	**1,755**	**1,775**

52 Divert Reuseables

Year	2021	2022	2023	2024	2025	2026
Program Benefits	$5,124	$5,207	$5,276	$5,340	$5,403	$5,465
Program Cost	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000
Net Benefits	$4,124	$4,207	$4,276	$4,340	$4,403	$4,465
Tons avoided through recycling	**102**	**103**	**105**	**106**	**107**	**108**

Summary - Recycli Program Benefits Costs Scena 31, Recommended

41 Restore Education

Year	2027	2028	2029	2030
Program Benefits	$565,474	$570,995	$576,523	$582,242
Program Cost	$490,894	$489,830	$488,799	$487,736
Net Benefits	$74,580	$81,164	$87,725	$94,506
Tons avoided through recycling	**4,084**	**4,124**	**4,164**	**4,205**

42 Latex Paint Prod Stew

Year	2027	2028	2029	2030
Program Benefits	$119,112	$120,486	$121,927	$123,441
Program Cost	$0	$0	$0	$0
Net Benefits	$119,112	$120,486	$121,927	$123,441
Tons avoided through recycling	**860**	**870**	**881**	**892**

43 New Education - Com

Year	2027	2028	2029	2030
Program Benefits	$224,977	$227,377	$229,730	$232,171
Program Cost	($86,451)	($88,603)	($90,711)	($92,900)
Net Benefits	$311,428	$315,980	$320,441	$325,071
Tons avoided through recycling	**3,568**	**3,606**	**3,644**	**3,682**

44 Phone & Junk Opt Out

Year	2027	2028	2029	2030
Program Benefits	$457,863	$460,871	$463,995	$467,383
Program Cost	$183,266	$83,266	$83,266	$83,266
Net Benefits	$274,597	$377,605	$380,729	$384,117
Tons avoided through recycling	**3,307**	**3,329**	**3,351**	**3,376**

45 Ban Clean Wood

Year	2027	2028	2029	2030
Program Benefits	$479,696	$484,819	$489,842	$495,055
Program Cost	$288,785	$291,816	$294,788	$297,871
Net Benefits	$190,911	$193,003	$195,054	$197,183
Tons avoided through recycling	**7,608**	**7,689**	**7,769**	**7,852**

46 Com C&D Ban

Year	2027	2028	2029	2030
Program Benefits	$974,009	$981,573	$989,344	$997,392
Program Cost	$1,263,615	$1,272,612	$1,281,857	$1,291,429
Net Benefits	($289,606)	($291,040)	($292,512)	($294,038)
Tons avoided through recycling	**15,448**	**15,568**	**15,691**	**15,819**

50 Plast Film Ban

Year	2027	2028	2029	2030
Program Benefits	$6,724	$6,796	$6,866	$6,939
Program Cost	$0	$0	$0	$0
Net Benefits	$6,724	$6,796	$6,866	$6,939
Tons avoided through recycling	**107**	**108**	**109**	**110**

51 Pre Scale Recycle

Year	2027	2028	2029	2030
Program Benefits	$90,574	$91,543	$92,491	$93,476
Program Cost	$238,384	$237,298	$236,234	$235,129
Net Benefits	($147,810)	($145,755)	($143,743)	($141,654)
Tons avoided through recycling	**1,795**	**1,815**	**1,833**	**1,853**

52 Divert Reuseables

Year	2027	2028	2029	2030
Program Benefits	$5,526	$5,585	$5,643	$5,703
Program Cost	$1,000	$1,000	$1,000	$1,000
Net Benefits	$4,526	$4,585	$4,643	$4,703
Tons avoided through recycling	**110**	**111**	**112**	**113**

Construction and Demolition Debris Program Tons Per Year
Scenario 78, Recommended

				Order ->	7	6	1	4	5	2	8	10	12	13
Year	Recycle Rate	Total Material	Total Diposed	Total Diverted	Beneficial Uses	C&D Priv Rec	Deconstruction Single Family	Built Green	LEED Program	Voluntary Assessment	Facility Certification	ABC BAN	Bans beyond ABC 2013	Bans beyond ABC 2014
		-	-	-	90	99	80	82	83	81	94	92	78	77
ALL MATERIALS														
2007	49.3%	415,801	201,156	214,645	9,738	204,907	-	-	-	-	-	-	-	-
2008	50.6%	397,052	181,241	215,811	14,961	200,851	-	-	-	-	-	-	-	-
2009	56.4%	288,551	115,446	173,105	10,362	162,742	-	-	-	-	-	-	-	-
2010	57.2%	313,461	123,165	190,295	10,971	171,595	4	317	7,409	-	-	-	-	-
2011	57.6%	327,334	127,449	199,885	11,306	176,445	10	833	11,291	-	-	-	-	-
2012	58.1%	351,228	134,996	216,232	11,998	186,873	30	2,017	14,539	59	257	459	-	-
2013	58.7%	371,060	140,583	230,477	12,558	195,293	86	3,960	16,509	168	694	884	325	-
2014	60.2%	375,819	137,147	238,672	12,612	196,063	231	5,860	17,121	448	1,666	1,276	761	2,635
2015	61.9%	370,548	129,038	241,510	12,319	192,068	572	6,947	16,974	1,109	3,384	1,467	1,473	5,198
2016	64.1%	368,871	120,413	248,458	12,082	190,141	1,284	7,447	16,864	2,489	5,669	1,525	2,309	8,648
2017	66.4%	348,631	106,101	242,530	11,106	178,735	2,256	7,207	15,844	4,365	7,277	1,435	2,782	11,522
2018	68.2%	339,571	97,680	241,891	10,270	173,603	3,213	7,053	15,333	6,205	8,186	1,351	2,992	13,683
2019	69.4%	337,796	93,952	243,844	9,275	173,270	3,851	7,016	15,188	7,428	8,604	1,248	3,058	14,905
2020	70.3%	338,772	92,653	246,120	7,965	175,395	4,177	7,032	15,200	8,052	8,760	1,105	3,055	15,378
2021	70.9%	355,170	96,353	258,818	7,015	185,791	4,515	7,370	15,923	8,701	9,187	1,005	3,160	16,150
2022	71.2%	362,478	97,964	264,514	6,305	190,912	4,661	7,521	16,245	8,981	9,352	925	3,193	16,419
2023	71.4%	357,540	96,475	261,065	5,822	188,931	4,617	7,418	16,022	8,896	9,210	865	3,134	16,151
2024	71.5%	353,337	95,281	258,056	5,594	186,962	4,570	7,331	15,833	8,806	9,095	835	3,090	15,942
2025	71.5%	343,254	92,540	250,714	5,375	181,720	4,442	7,122	15,381	8,559	8,833	804	2,999	15,479
2026	71.5%	337,940	91,099	246,841	5,270	178,942	4,374	7,012	15,142	8,428	8,695	789	2,952	15,237
2027	71.5%	340,503	91,787	248,716	5,301	180,312	4,407	7,065	15,257	8,493	8,761	794	2,974	15,351
2028	71.5%	343,496	92,593	250,903	5,345	181,902	4,446	7,127	15,391	8,568	8,838	801	3,000	15,486
2029	71.5%	345,141	93,036	252,105	5,369	182,775	4,468	7,161	15,465	8,609	8,880	804	3,014	15,560
2030	71.5%	349,601	94,238	255,363	5,438	185,137	4,525	7,253	15,665	8,720	8,995	815	3,053	15,761
WITHOUT CONCRETE														
2007	16.0%	231,093	184,455	46,638	9,738	36,900	-	-	-	-	-	-	-	-
2008	12.1%	207,802	167,760	40,043	14,961	25,082	-	-	-	-	-	-	-	-
2009	23.1%	151,017	105,816	45,201	10,362	34,838	-	-	-	-	-	-	-	-
2010	24.4%	164,054	113,032	51,022	10,971	36,996	2	106	2,947	-	-	-	-	-
2011	25.1%	171,315	117,041	54,274	11,306	38,191	4	279	4,494	-	-	-	-	-
2012	25.7%	183,820	124,496	59,324	11,998	40,583	13	675	5,792	59	204	-	-	-
2013	26.5%	194,199	130,111	64,088	12,558	42,536	37	1,325	6,586	168	554	-	325	-
2014	28.8%	196,690	127,423	69,267	12,612	42,778	98	1,960	6,837	448	1,349	-	761	2,425
2015	31.6%	193,931	120,299	73,632	12,319	41,878	242	2,319	6,776	1,109	2,808	-	1,473	4,708
2016	35.4%	193,054	112,706	80,347	12,082	41,294	543	2,476	6,716	2,489	4,840	-	2,309	7,599
2017	39.2%	182,461	99,920	82,540	11,106	38,570	954	2,382	6,282	4,365	6,349	-	2,782	9,751
2018	42.1%	177,719	92,698	85,020	10,270	37,306	1,358	2,316	6,051	6,205	7,244	-	2,992	11,277
2019	43.9%	176,790	89,827	86,963	9,275	37,353	1,628	2,295	5,975	7,428	7,708	-	3,058	12,242
2020	45.2%	177,301	89,200	88,101	7,965	38,206	1,766	2,296	5,971	8,052	7,958	-	3,055	12,833
2021	46.0%	185,883	93,284	92,599	7,015	40,940	1,908	2,404	6,251	8,701	8,454	-	3,160	13,764
2022	46.5%	189,708	95,167	94,540	6,305	42,387	1,970	2,452	6,376	8,981	8,677	-	3,193	14,199
2023	46.7%	187,123	93,870	93,254	5,822	42,098	1,952	2,419	6,288	8,896	8,578	-	3,134	14,068
2024	46.8%	184,924	92,768	92,156	5,594	41,720	1,932	2,390	6,214	8,806	8,485	-	3,090	13,926
2025	46.8%	179,646	90,121	89,525	5,375	40,573	1,878	2,322	6,036	8,559	8,245	-	2,999	13,538
2026	46.9%	176,865	88,726	88,139	5,270	39,962	1,849	2,286	5,943	8,428	8,119	-	2,952	13,331
2027	46.9%	178,207	89,399	88,807	5,301	40,271	1,863	2,303	5,988	8,493	8,181	-	2,974	13,434
2028	46.9%	179,773	90,185	89,588	5,345	40,627	1,880	2,323	6,041	8,568	8,253	-	3,000	13,552
2029	46.9%	180,634	90,617	90,017	5,369	40,822	1,889	2,335	6,069	8,609	8,292	-	3,014	13,617
2030	46.9%	182,968	91,788	91,180	5,438	41,350	1,913	2,365	6,148	8,720	8,399	-	3,053	13,793

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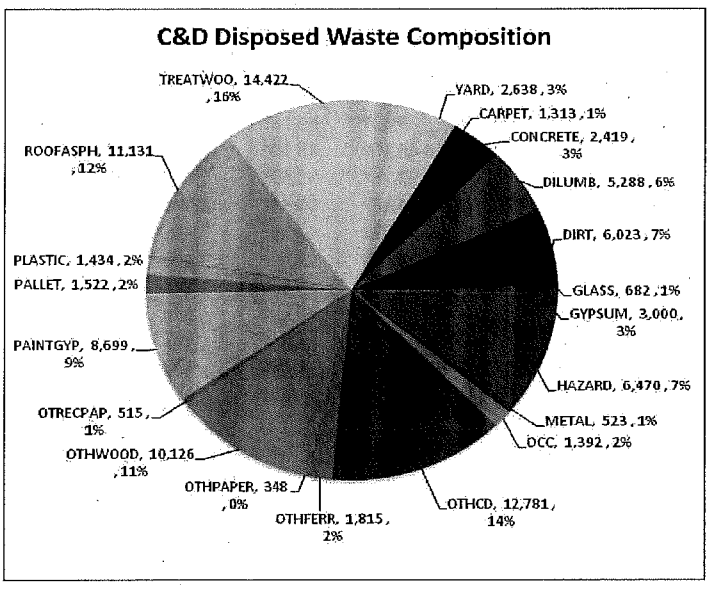
Construction and Demolition Materials Diversion by Program
Scenario 78, Recommended Year 2025

ALL MATERIALS (in tons per year)

Material C&D		Total Disposed	Total Generated	Total Beneficial Uses	Total Recycled	Percent Recycled	C&D Priv Rec	Facility Certification	Beneficial Uses	ABC BAN	Deconstruction Single Family	Voluntary Assessment	Built Green	LEED Program	Bans beyond ABC 2013	Bans beyond ABC 2014	
		a	d = a + b + c	b	c	c/d	99	94	90	92	80	81	82	83	78	77	Total
Carpet	CARPET	1,313	1,946	-	633	32.5%	103	134	-	-	28	-	21	118	229	-	633
Rock/ Concrete/ Brick/ Ceramic & Porcelain	CONCRETE	2,419	163,607	-	161,189	98.5%	141,147	588	-	804	2,564	-	4,800	9,344	-	1,942	161,189
Dimension lumber	DILUMB	5,288	21,402	1,587	14,528	67.9%	6,775	1,109	1,587	-	320	861	506	1,077	-	3,879	16,115
Sand/Soil/Dirt	DIRT	6,023	7,510	-	1,487	19.8%	-	763	-	-	107	-	95	523	-	-	1,487
Glass	GLASS	682	682	-	-	0.0%	-	-	-	-	-	-	-	-	-	-	-
Clean Gypsum Board	GYPSUM	3,000	10,807	-	7,807	72.2%	5,389	449	-	-	104	-	222	376	1,267	-	7,807
Hazardous & Other	HAZARD	6,470	6,512	-	42	0.6%	-	-	-	-	-	42	-	-	-	-	42
Metal	METAL	523	7,345	-	6,822	92.9%	4,036	110	-	-	110	1,754	137	292	384	-	6,822
Corrugated Kraft (OCC)	OCC	1,392	1,392	-	-	0.0%	-	-	-	-	-	-	-	-	-	-	-
Other C&D	OTHCD	12,781	26,563	877	12,905	48.6%	10,759	1,119	877	-	220	-	109	699	-	-	13,781
Other ferrous	OTHFERR	1,815	3,835	-	2,020	52.7%	159	333	-	-	55	221	74	174	1,005	-	2,020
Other Paper	OTHPAPER	348	419	-	71	16.9%	-	42	-	-	4	-	6	20	-	-	71
Other recyclable wood	OTHWOOD	10,126	32,813	2,458	20,229	61.6%	10,495	1,514	2,458	-	468	1,321	643	1,511	-	4,277	22,687
Other Recyclable Paper	OTRECPAP	515	601	-	86	14.3%	-	71	-	-	8	-	8	-	-	-	86
Painted/Demolition Gypsum	PAINTGYP	8,699	9,382	-	683	7.3%	-	439	-	-	79	-	19	146	-	-	683
Pallets & crates	PALLET	1,522	5,854	453	3,880	66.3%	1,932	293	453	-	88	-	144	307	-	1,116	4,333
Plastic	PLASTIC	1,434	1,993	-	558	28.0%	-	143	-	-	22	180	19	79	115	-	558
Roofing (asphalt & comp)	ROOFASPH	11,131	19,334	-	8,203	42.4%	926	1,728	-	-	249	-	320	714	-	4,266	8,203
Treated and contaminated wood	TREATWOO	14,422	18,618	-	4,196	22.5%	-	-	-	-	16	4,180	-	-	-	-	4,196
Yard waste & other organics	YARD	2,638	2,638	-	-	0.0%	-	-	-	-	-	-	-	-	-	-	-
Total	**Grand Total**	**92,540**	**343,254**	**5,375**	**245,339**	**71.5%**	**181,720**	**8,833**	**5,375**	**804**	**4,442**	**8,559**	**7,122**	**15,381**	**2,999**	**15,479**	**250,714**

Year	Total Disposed	Total Generated	Total Beneficial Uses	Total Recycled	Percent Recycled
2007	201,156	415,801	9,738	204,907	49.3%
2008	181,241	397,052	14,961	200,851	50.6%
2009	115,446	288,551	10,362	162,742	56.4%
2010	123,165	313,461	10,971	179,325	57.2%
2011	127,449	327,334	11,306	188,579	57.6%
2012	134,996	351,228	11,998	204,235	58.1%
2013	140,583	371,060	12,558	217,919	58.7%
2014	137,147	375,819	12,612	226,060	60.2%
2015	129,038	370,548	12,319	229,191	61.9%
2016	120,413	368,871	12,082	236,376	64.1%
2017	106,101	348,631	11,106	231,424	66.4%
2018	97,680	339,571	10,270	231,621	68.2%
2019	93,952	337,796	9,275	234,569	69.4%
2020	92,653	338,772	7,965	238,155	70.3%
2021	96,353	355,170	7,015	251,803	70.9%
2022	97,964	362,478	6,305	258,209	71.2%
2023	96,475	357,540	5,822	255,243	71.4%
2024	95,281	353,337	5,594	252,463	71.5%
2025	92,540	343,254	5,375	245,339	71.5%
2026	91,099	337,940	5,270	241,571	71.5%
2027	91,787	340,503	5,301	243,415	71.5%
2028	92,593	343,496	5,345	245,558	71.5%
2029	93,036	345,141	5,369	246,736	71.5%
2030	94,238	349,601	5,438	249,925	71.5%



Construction and Demolition Summary - Recycling Program Benefits Cost
Scenario 78, Recommended

Total

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Year	Present Value	2010	2011	2012	2013
Program Benefits	$42,963,512	$429	$1,215	$93,480	$250,213
Program Cost	$2,236,516	$20,000	$65,000	$100,000	$125,000
Net Benefits	$40,726,996	($19,571)	($63,785)	($6,520)	$125,213
Tons avoided through recycling	**608,188**	**4**	**10**	**806**	**2,157**

New Programs

(existing programs 90 and 99 not included)

77 Bans beyond ABC 2014

Year	Present Value	2010	2011	2012	2013
Program Benefits	$16,205,753	$0	$0	$0	$0
Program Cost	$586,650	$0	$0	$0	$35,000
Net Benefits	$15,619,104	$0	$0	$0	($35,000)
Tons avoided through recycling	**229,505**	-	-	-	-
	$68				

78 Bans beyond ABC 2013

Year	Present Value	2010	2011	2012	2013
Program Benefits	$3,386,016	$0	$0	$0	$37,670
Program Cost	$636,225	$0	$0	$35,000	$20,000
Net Benefits	$2,749,791	$0	$0	($35,000)	$17,670
Tons avoided through recycling	**47,325**	-	-	-	**325**
	$58				

80 Deconstruction Single Family

Year	Present Value	2010	2011	2012	2013
Program Benefits	$4,218,528	$429	$1,215	$3,530	$10,021
Program Cost	$423,737	$20,000	$25,000	$30,000	$30,000
Net Benefits	$3,794,791	($19,571)	($23,785)	($26,470)	($19,979)
Tons avoided through recycling	**60,741**	**4**	**10**	**30**	**86**
	$62				

81 Voluntary Assessment

Year	Present Value	2010	2011	2012	2013
Program Benefits	$8,131,930	$0	$0	$6,855	$19,461
Program Cost	$234,676	$0	$0	$10,000	$15,000
Net Benefits	$7,897,254	$0	$0	($3,145)	$4,461
Tons avoided through recycling	**117,087**	-	-	**59**	**168**
	$67				

92 ABC BAN

Year	Present Value	2010	2011	2012	2013
Program Benefits	$1,475,275	$0	$0	$53,232	$102,551
Program Cost	$82,124	$0	$5,000	$10,000	$10,000
Net Benefits	$1,393,150	$0	($5,000)	$43,232	$92,551
Tons avoided through recycling	**19,187**	-	-	**459**	**884**
	$73				

94 Facility Certification

Year	Present Value	2010	2011	2012	2013
Program Benefits	$9,546,010	$0	$0	$29,863	$80,509
Program Cost	$273,104	$0	$35,000	$15,000	$15,000
Net Benefits	$9,272,906	$0	($35,000)	$14,863	$65,509
Tons avoided through recycling	**134,344**	-	-	**257**	**694**
	$69				

Construction and Demolition Summary - Recycling Program Benefits Cost
Scenario 78, Recommended

Total

Year	2014	2015	2016	2017	2018	2019
Program Benefits	$813,888	$1,531,475	$2,543,242	$3,437,967	$4,133,172	$4,535,080
Program Cost	$165,000	$215,000	$215,000	$190,000	$180,000	$180,000
Net Benefits	$648,888	$1,316,475	$2,328,242	$3,247,967	$3,953,172	$4,355,080
Tons avoided through recycling	**7,016**	**13,202**	**21,925**	**29,638**	**35,631**	**39,096**

New Programs

77 Bans beyond ABC 2014

Year	2014	2015	2016	2017	2018	2019
Program Benefits	$305,675	$602,970	$1,003,207	$1,336,516	$1,587,192	$1,728,984
Program Cost	$20,000	$55,000	$85,000	$60,000	$45,000	$65,000
Net Benefits	$285,675	$547,970	$918,207	$1,276,516	$1,542,192	$1,663,984
Tons avoided through recycling	**2,635**	**5,198**	**8,648**	**11,522**	**13,683**	**14,905**

78 Bans beyond ABC 2013

Year	2014	2015	2016	2017	2018	2019
Program Benefits	$88,224	$170,836	$267,837	$322,679	$347,090	$354,770
Program Cost	$55,000	$85,000	$60,000	$45,000	$65,000	$45,000
Net Benefits	$33,224	$85,836	$207,837	$277,679	$282,090	$309,770
Tons avoided through recycling	**761**	**1,473**	**2,309**	**2,782**	**2,992**	**3,058**

80 Deconstruction Single F

Year	2014	2015	2016	2017	2018	2019
Program Benefits	$26,763	$66,325	$148,964	$261,749	$372,761	$446,765
Program Cost	$30,000	$30,000	$30,000	$30,000	$30,000	$30,000
Net Benefits	($3,237)	$36,325	$118,964	$231,749	$342,761	$416,765
Tons avoided through recycling	**231**	**572**	**1,284**	**2,256**	**3,213**	**3,851**

81 Voluntary Assessment

Year	2014	2015	2016	2017	2018	2019
Program Benefits	$51,960	$128,696	$288,705	$506,370	$719,817	$861,701
Program Cost	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000
Net Benefits	$31,960	$108,696	$268,705	$486,370	$699,817	$841,701
Tons avoided through recycling	**448**	**1,109**	**2,489**	**4,365**	**6,205**	**7,428**

92 ABC BAN

Year	2014	2015	2016	2017	2018	2019
Program Benefits	$148,019	$170,150	$176,872	$166,477	$156,765	$144,771
Program Cost	$10,000	$10,000	$5,000	$5,000	$5,000	$5,000
Net Benefits	$138,019	$160,150	$171,872	$161,477	$151,765	$139,771
Tons avoided through recycling	**1,276**	**1,467**	**1,525**	**1,435**	**1,351**	**1,248**

94 Facility Certification

Year	2014	2015	2016	2017	2018	2019
Program Benefits	$193,247	$392,498	$657,657	$844,177	$949,546	$998,089
Program Cost	$30,000	$15,000	$15,000	$30,000	$15,000	$15,000
Net Benefits	$163,247	$377,498	$642,657	$814,177	$934,546	$983,089
Tons avoided through recycling	**1,666**	**3,384**	**5,669**	**7,277**	**8,186**	**8,604**

Construction and D molition Summary - Recycling P gram Benefits Cost
Scenario 78, Recommended

Total

Year	2020	2021	2022	2023	2024	2025
Program Benefits	$4,701,184	$4,955,366	$5,049,612	$4,973,231	$4,911,127	$4,769,547
Program Cost	$175,000	$180,000	$180,000	$175,000	$180,000	$180,000
Net Benefits	$4,526,184	$4,775,366	$4,869,612	$4,798,231	$4,731,127	$4,589,547
Tons avoided through recycling	**40,527**	**42,719**	**43,531**	**42,873**	**42,337**	**41,117**

New Programs

77 Bans beyond ABC 2014

Year	2020	2021	2022	2023	2024	2025
Program Benefits	$1,783,824	$1,873,416	$1,904,547	$1,873,552	$1,849,254	$1,795,604
Program Cost	$45,000	$45,000	$65,000	$45,000	$45,000	$65,000
Net Benefits	$1,738,824	$1,828,416	$1,839,547	$1,828,552	$1,804,254	$1,730,604
Tons avoided through recycling	**15,378**	**16,150**	**16,419**	**16,151**	**15,942**	**15,479**

78 Bans beyond ABC 2013

Year	2020	2021	2022	2023	2024	2025
Program Benefits	$354,325	$366,610	$370,390	$363,487	$358,451	$347,936
Program Cost	$45,000	$65,000	$45,000	$45,000	$65,000	$45,000
Net Benefits	$309,325	$301,610	$325,390	$318,487	$293,451	$302,936
Tons avoided through recycling	**3,055**	**3,160**	**3,193**	**3,134**	**3,090**	**2,999**

80 Deconstruction Single F

Year	2020	2021	2022	2023	2024	2025
Program Benefits	$484,569	$523,724	$540,647	$535,547	$530,080	$515,250
Program Cost	$30,000	$30,000	$30,000	$30,000	$30,000	$30,000
Net Benefits	$454,569	$493,724	$510,647	$505,547	$500,080	$485,250
Tons avoided through recycling	**4,177**	**4,515**	**4,661**	**4,617**	**4,570**	**4,442**

81 Voluntary Assessment

Year	2020	2021	2022	2023	2024	2025
Program Benefits	$934,085	$1,009,329	$1,041,849	$1,031,988	$1,021,440	$992,859
Program Cost	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000
Net Benefits	$914,085	$989,329	$1,021,849	$1,011,988	$1,001,440	$972,859
Tons avoided through recycling	**8,052**	**8,701**	**8,981**	**8,896**	**8,806**	**8,559**

92 ABC BAN

Year	2020	2021	2022	2023	2024	2025
Program Benefits	$128,169	$116,623	$107,301	$100,299	$96,876	$93,275
Program Cost	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000
Net Benefits	$123,169	$111,623	$102,301	$95,299	$91,876	$88,275
Tons avoided through recycling	**1,105**	**1,005**	**925**	**865**	**835**	**804**

94 Facility Certification

Year	2020	2021	2022	2023	2024	2025
Program Benefits	$1,016,211	$1,065,664	$1,084,877	$1,068,357	$1,055,026	$1,024,622
Program Cost	$30,000	$15,000	$15,000	$30,000	$15,000	$15,000
Net Benefits	$986,211	$1,050,664	$1,069,877	$1,038,357	$1,040,026	$1,009,622
Tons avoided through recycling	**8,760**	**9,187**	**9,352**	**9,210**	**9,095**	**8,833**

Construction and Demolition Summary - Recycling Program Benefits Cost
Scenario 78, Recommended

Total

Year	2026	2027	2028	2029	2030
Program Benefits	$4,695,173	$4,730,579	$4,772,086	$4,794,913	$4,856,863
Program Cost	$175,000	$180,000	$180,000	$175,000	$180,000
Net Benefits	$4,520,173	$4,550,579	$4,592,086	$4,619,913	$4,676,863
Tons avoided through recycling	**40,476**	**40,781**	**41,139**	**41,335**	**41,870**

New Programs

77 Bans beyond ABC 2014

Year	2026	2027	2028	2029	2030
Program Benefits	$1,767,480	$1,780,762	$1,796,369	$1,804,955	$1,828,273
Program Cost	$45,000	$45,000	$65,000	$45,000	$45,000
Net Benefits	$1,722,480	$1,735,762	$1,731,369	$1,759,955	$1,783,273
Tons avoided through recycling	**15,237**	**15,351**	**15,486**	**15,560**	**15,761**

78 Bans beyond ABC 2013

Year	2026	2027	2028	2029	2030
Program Benefits	$342,445	$345,002	$348,020	$349,682	$354,198
Program Cost	$45,000	$65,000	$45,000	$45,000	$65,000
Net Benefits	$297,445	$280,002	$303,020	$304,682	$289,198
Tons avoided through recycling	**2,952**	**2,974**	**3,000**	**3,014**	**3,053**

80 Deconstruction Single F

Year	2026	2027	2028	2029	2030
Program Benefits	$507,382	$511,269	$515,778	$518,254	$524,953
Program Cost	$30,000	$30,000	$30,000	$30,000	$30,000
Net Benefits	$477,382	$481,269	$485,778	$488,254	$494,953
Tons avoided through recycling	**4,374**	**4,407**	**4,446**	**4,468**	**4,525**

81 Voluntary Assessment

Year	2026	2027	2028	2029	2030
Program Benefits	$977,694	$985,185	$993,873	$998,644	$1,011,552
Program Cost	$20,000	$20,000	$20,000	$20,000	$20,000
Net Benefits	$957,694	$965,185	$973,873	$978,644	$991,552
Tons avoided through recycling	**8,428**	**8,493**	**8,568**	**8,609**	**8,720**

92 ABC BAN

Year	2026	2027	2028	2029	2030
Program Benefits	$91,523	$92,102	$92,869	$93,298	$94,498
Program Cost	$5,000	$5,000	$5,000	$5,000	$5,000
Net Benefits	$86,523	$87,102	$87,869	$88,298	$89,498
Tons avoided through recycling	**789**	**794**	**801**	**804**	**815**

94 Facility Certification

Year	2026	2027	2028	2029	2030
Program Benefits	$1,008,650	$1,016,258	$1,025,176	$1,030,080	$1,043,389
Program Cost	$30,000	$15,000	$15,000	$30,000	$15,000
Net Benefits	$978,650	$1,001,258	$1,010,176	$1,000,080	$1,028,389
Tons avoided through recycling	**8,695**	**8,761**	**8,838**	**8,880**	**8,995**

Appendix E
Recycling Businesses Reporting

Appendix E: Recycling Business Reporting

The following contains information about the annual reporting required of recycling businesses. This information is taken from the annual letter mailed to Seattle Recycler License holders.

2010 Seattle Recycling Annual Report and 2011 Recycler License

Who should obtain a City of Seattle Recycler License and file an Annual Report?

You are required to have a Seattle Recycler License if during 2011 your business expects to collect or haul recyclable materials originating in the City of Seattle, regardless of where the materials are to be delivered; or if you will operate a materials recovery facility (MRF) or expect to provide drop boxes or operate one or more drop-off facilities for recyclable materials in the City. **If you engaged in any of these activities in 2010, you must file a completed annual report on the quantities of materials you handled along with your 2011 license application by March 31, 2011.**

Specifically, under Seattle Municipal Code subchapter 6.250.020, a Recycler License and annual reporting is required of collectors and processors of recyclable materials as follows:

"Collector" means:

1. A person who operates one or more vehicles for the collection of recyclable materials from residential, commercial or industrial premises or construction sites in the City; or
2. A person engaged in construction, demolition or land clearing who hauls recyclable materials away from job sites in the City; or
3. A person who places drop boxes, kiosks, barrels or other containers in the City where the public may deposit recyclable materials; or
4. A person who maintains one or more business premises in the City where the public may bring recyclable materials, including but not limited to salvaged or surplus building materials and discarded household items and clothing; or
5. A person who, as part of regular business activities in the City, transports recyclable materials, including but not limited to product packaging, oils and food waste, directly from one or more business premises to a recyclable materials processor.

City contractors who pick up residential and/or commercial garbage, recyclable materials, including food and yard waste are collectors under this definition.

"Processor" means:

A person who operates a facility that receives recyclable materials originating in the City from collectors or private individuals where such materials are sorted for marketability by type, quality or other criteria and then sold directly to the public for reuse or shipped to a recycling firm or facility for further processing. City contractors who operate transfer stations, materials recovery facilities (MRFs) or other facilities where waste materials are sorted for reshipment or disposal are processors under this definition.

A business such as a recyclable materials processor or MRF located outside the City of Seattle is not required to obtain a Seattle Recycler License unless the business also operates hauling or collection services in Seattle as specified above.

Businesses required to file an annual report should be aware that the list of materials and their definitions are similar and in most cases identical to those required in annual reports that also must be filed with the Department of Ecology (Ecology). The list includes materials whose end uses are outside the state's and City's definition of recycling (such as the burning of used oil or wood scrap for energy generation). Nevertheless, the quantities of these materials handled and not in the end disposed in a landfill should be included in your Recycling Annual Report. These materials will not be included in the City's recycling rate but will be reported separately as tons diverted from the landfill, which remains an important objective.

Please note:

1. **The Seattle Recycling Annual Report requires that you separately list tonnages for recyclable materials originating from construction and demolition (C&D) activities.**

2. **Because of this change Seattle and Ecology forms are no longer identical. Use this form for your Seattle Recycling Annual Report. File with the Department of Ecology using only the forms provided by Ecology. (For Ecology forms, contact Layne Nakagawa, recycling survey coordinator at the Department of Ecology, at (360) 407-6409 or e-mail Layne.nakagawa@ecy.wa.gov.)***

   **July 2012 update: for Ecology forms contact Daniel Weston (360) 407-6409, Daniel.weston@ecy.wa.gov*

Seattle Recycling Annual Report for 2010

Instructions:

1. Fill in the information about your business on the **Collector-Processor Identification Form** (Page 3). (Note: Your business identification code is the number the Department of Ecology has assigned you. If this is your first report to Ecology or Seattle, you may not have one.)

2. The City does not release or publish individual company reports; however, you may wish to formally request confidentiality for your firm's annual report forms for 2010. If so, prepare a letter as described at the bottom of Page 3.

3. Review the **Material Type Definitions** on Page 4 for the materials on which you will be reporting. (These definitions may be updated from year to year.)

4. Provide the tonnages of the materials you collected or processed in Seattle during 2010 on the **Materials Form.** The forms provided are substantially similar to the annual reporting forms you are required to provide to the Department of Ecology. **However, the City requires that you itemize recycled materials originating from construction and demolition (C&D) projects and use only City of Seattle forms for reporting. Space is now provided on Page 6 for C&D materials. Photocopies of Ecology forms will no longer be accepted.**

5. Complete the **Destination of Materials Form**, listing the companies to which you sold or delivered recyclable materials and the tonnages sold or delivered during 2010. Space is now provided on Page 8 for C&D materials. **Note that if you use all the blank lines on Page 8 you must copy the form so that each individual buyer of your materials can be shown on a separate line.**

6. When you have finished, please review your entries for completeness and check for errors. On the Materials Form, **be sure you are reporting ONLY Seattle-origin tons**. On the Destination of Materials Form **be sure to report ALL businesses you sold or delivered to in 2010 and that you've entered the final use in each case.** Note that for all forms in this packet, **reporting in tons is required**. For conversion of volume and various units to tons, see the **Volume and Count to Weight Conversion Factors for Recyclables** table on pages 9 and 10.

7. Completed annual reports (pages 3 through 8 of this packet) along with your Recycler License application and $100 fee should be returned to:

   City of Seattle, Department of Finance and Administrative Services
   Attn: Iskra Ivanova
   700 5th Avenue Suite 4250
   P.O. Box 34214
   Seattle WA 98124-4214

Or, you may send an electronic copy in MS Word of your annual report as an email attachment to:

Luis Hillon, Seattle Public Utilities
luis.hillon@seattle.gov

However, even when filing your annual report electronically, you must send your Recycler License application and fee to the Department of Finance and Administrative Services at the address above.

City of Seattle

SEATTLE PUBLIC UTILITIES

Ray Hoffman, Acting Director

2010 Seattle Recycling Annual Report – Due March 31, 2011

Recyclable materials collector/processor information, all fields required:

Business/Company Name		ID Code (Provided by Dept. Ecology)	
Contact Person		Title	
Telephone		FAX	
Email			
Mailing Address		Business Location (If Different)	
City		City	
State	Zip + 4	State	Zip + 4

Check if you are a "Collector"____ or "Processor"____ under the definitions on page 1.

Did you operate in 2010? Yes___ No ___ If yes, proceed to complete the forms below.

If **NO**, answer the following questions, sign, date and return only this page.
When did you stop operations? _____ Do you plan to restart? **Yes**___ **No**____
If, yes, when? _____ (If planning to restart in 2011 you must obtain a Recycler License.)

Report prepared by (Signature Required): _____**Date** _____

Please note that the City does not release or publish individual company reports. Information you provide as part of the Seattle Recycling Annual Report will be compiled with the information submitted by other companies. If your firm desires confidentiality in the event of a public request for information, please refer to the procedure below.

The information you provide on your Recycling Annual Report forms may be protected from public disclosure under the Public Records Act, RCW 42.56 if the information qualifies as "trade secrets" under the Uniform Trade Secrets Act, RCW 19.108. The Uniform Trade Secrets Act defines a "trade secret" as information that "derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use and is the subject of

reasonable efforts to maintain its secrecy."

If you would like the City to consider the information in your firm's Recycling Annual Report form to be "trade secrets" under the Uniform Trade Secrets Act, RCW 19.108, and exempt from the disclosure requirements of the Public Records Act, RCW 42.56, please include with your Recycler License application and completed Annual Report a letter to the Director of SPU explaining how the information contained in the survey form constitutes "trade secrets." Should the City receive a public records request for this information, the City will notify you and you will have the opportunity to present additional information concerning the nature of the information and why it should not be subject to public disclosure.

Lists of recyclers serving the Seattle area can be found at the State of Washington Department of Ecology website 1-800-RECYCLE. Or by calling 1-800-732-9253.

Appendix F

State Environmental Policy Act (SEPA) Documents

Seattle Public Utilities

Memorandum

Date: July 2, 2012

From: Betty Meyer *Betty Meyer*
SEPA Responsible Official

To: Vicky Beaumont, Project Manager
Solid Waste Management Plan Revision

Re: SEPA Closeout

This memorandum documents the completion of the SEPA process for the Environmental Checklist and the Threshold Determination of Non-Significance (DNS).

The DNS was issued and sent to the Washington Department of Ecology SEPA Public Information Center on June 7, 2012, and was entered in the SEPA Register. It was published in the Daily Journal of Commerce in the June 7th and June 14th editions, and included in the Seattle Department of Planning and Development Land Use Information Bulletin issue dated June 7. The DNS was transmitted timely to the Seattle Times and appeared on-line and in the printed edition on June 7.

The comment period ended on June 21st and the appeal period ended on June 28, 2012.

No comments were received.

No appeals were filed, the SEPA process is completed, and this non-project action is authorized to proceed, contingent on any other required permits and approvals.

City of Seattle
Seattle Public Utilities

Solid Waste Management Plan Revision
SEPA Determination of Non-Significance (DNS)

Description of Proposal
In a continued effort to provide reliable, efficient, and environmentally conscious utility services to its customers, Seattle Public Utilities (SPU) has prepared the Preliminary Draft *2011 Solid Waste Plan Revision* (2011 Plan). This Plan updates the 1998 Solid Waste Management Plan, *On the Path to Sustainability*, as amended in 2004. The Plan also satisfies a State requirement to maintain a coordinated, comprehensive solid waste management plan in a current and applicable condition (RCW 70.95).

The 2011 Plan describes how SPU will manage City of Seattle solid waste over the next 20 years and includes recommended strategies in each of three areas:

1. Preventing waste,
2. Increasing recycling and composting, and
3. Improving services.

The Plan does not detail the specific solid waste projects or activities that would be undertaken, but rather, describes the City's goals related to solid waste management and the types of activities necessary to achieve those goals in a safe and economical way. Plan implementation would require future evaluation and development of programs and capital improvement projects designed to address identified solid waste issues and needs.

Before it can be implemented, the 2011 Plan must be adopted by the Seattle City Council and then approved by the Washington State Department of Ecology. Adoption and approval of the 2011 Plan is considered a non-project action under SEPA.

Proponent
Seattle Public Utilities
Seattle Municipal Tower Suite 4900
P.O. Box 34018
Seattle, WA 98124-4018

Location of Proposal
The planning area for the 2011 Plan includes all areas within the municipal limits of the City of Seattle, King County, Washington, including about 82 square miles of land populated by about 610,000 people. SPU owns and operates two major solid waste transfer facilities, the North and South Recycling and Disposal stations located at 1350 North 34th Street (zip code 98106) and 8105 5th Avenue South (zip code 98134), respectively; and the North and South Household Hazardous Waste facilities at 12500 Stone Way North (zip code 98133) and 8100 2nd Avenue South (zip code 98108), respectively. Non-recyclable solid waste from the recycling and disposal stations is typically transported to privately owned intermodal facilities, where it is loaded onto railcars and transported to the Columbia Ridge Regional Landfill in

Ray Hoffman, Director
Seattle Public Utilities
700 5th Avenue, Suite 4900
PO Box 34018
Seattle, WA 98124-4018

Tel (206) 684-5851
Fax (206) 684-4631
TDD (206) 233-7241
ray.hoffman@seattle.gov

http://www.seattle.gov/util
An equal employment opportunity, affirmative action employer. Accommodations for people with disabilities provided on request.

Arlington, Oregon. Recyclable materials are transported to or picked up by private recycling business. Compostable materials are transported to Cedar Grove, a private composting business. The locations of future program and projects would be identified in the future, prior to implementation.

Lead Agency

Seattle Public Utilities, the lead agency for this proposal, determined that it does not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public on request.

This Determination of Non-significance (DNS) is issued under WAC 197-11-340(2); the lead agency will not act on this proposal for fourteen (14) days from the date below.

Copies of the Plan and the environmental checklist are available at:

- Seattle Public Utilities, Director's Office Main Reception Area, Seattle Municipal Tower, Suite 4900, 700 Fifth Avenue, Seattle, Washington
- Seattle Central Library, General Reference Section
- Online at http://www.seattle.gov/util/SolidWastePlan

Public and Agency Comments

Comments must be submitted by June 21, 2012 and must be sent to:

Betty Meyer, SEPA Responsible Official
Seattle Public Utilities
Seattle Municipal Tower, Suite 4900
P.O. Box 34018
Seattle, WA 98124-4018
206 386-1999
betty.meyer@seattle.gov

Signature: Betty Meyer — Issue Date: June 7, 2012

Appeals

Appeals of this DNS must be filed by 5:00 p.m. on June 28, 2012. The appeal must be in writing, accompanied by a $50.00 filing fee in a check made payable to the City of Seattle, and sent to:

City of Seattle Hearing Examiner
700 5th Avenue Suite 4000
P.O. Box 94729
Seattle, WA 98124-4729

You should be prepared to make specific factual objections. Contact the Hearing Examiner at 206-684-0521 to ask about or to make arrangements to read the procedures for SEPA appeals.

For interpretation services please call **206-233-7856**

如需要口譯服務，請撥電話號碼 **206-233-7856**

Para servicios de interpretación por favor llame al **206-233-7856**

Para sa serbisyo ng tagapagpaliwanag, tumawag sa 206-233-7856

Về dịch vụ phiên dịch xin gọi 206-233-7856

Appendix G

Seattle Solid Waste Advisory Committee (SWAC) Participation

Seattle
Public
Utilities

SEATTLE SOLID WASTE ADVISORY COMMITTEE

March 22, 2012

State of Washington
Department of Ecology
Waste 2 Resources Program

RE: Documentation of SWAC participation in Seattle's 2011 Solid Waste Plan Revision

Dear Washington Department of Ecology:

The Seattle Solid Waste Advisory Committee (SWAC) offers this letter as documentation that the SWAC has been involved with developing Seattle's Solid Waste Plan (SWP) 2011 Revision.

Our involvement began in 2008 with reviewing and advising on the **SOLID WASTE PLAN 2010 PROJECT GUIDE,** which SPU put together to define the scope and process of updating the SWP. The purpose of the Guide was to ensure project staff moved forward with:

- Clear objectives, outcomes and deliverables
- Comprehensive stakeholder identification
- Critical success factors and risks identified
- Staffing, decision, and review processes laid out

After that, the SWAC has continued to review and comment on many aspects of the Plan's development, which is documented in the SWAC's monthly meeting minutes. The meeting minutes are available at SPU's advisory committee web page at Seattle Public Utilities -- Meeting Schedule & Notes. SPU's advisory committee staff also keep meeting minutes in their files.

Some key milestones where the SWAC had direct involvement include:

- Setting the Plan's new outline
- Reviewing initial new recycling program alternatives, MSW and C&D

SEATTLE SOLID WASTE ADVISORY COMMITTEE

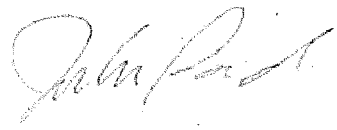
- Reviewing program modeling results and proposed recommendations
- Reviewing the first full version of the draft document
- Commenting on the feedback from the public involvement process
- Reviewing changes to the Plan's recommendations from the public involvement process

In addition, over the past few years the SWAC has talked about many of the issues and programs contained in the Plan, including

- Waste prevention: reuse, problem products, product stewardship, junk mail and yellow pages opt-out
- Commercial and C&D programming to improve recycling
- Organics diversion: mandatory multi-family organics subscription, quick-serve food packaging
- Biennial rate studies and rates incentives for recycling
- Every other week single-family garbage collection
- Facility rebuilds
- Alternative disposal technologies

The SWAC continues to discuss many of these topics and others, as we serve to ensure solid waste programming in Seattle is environmentally sound and brings the best possible value to Seattle's ratepayers. We appreciate SPU's diligent efforts to involve the SWAC in this process, and commend their approach to citizen feedback and involvement. We are confident the 2011 Plan Revision puts forward a balance of these values and poises Seattle for picking up the pace toward zero waste.

Sincerely



Julie Pond, Chair

Appendix H
Resolution of Adoption

Appendix H: Resolution of Adoption

The Seattle City Council resolution that will formally adopt the Seattle Solid Waste Plan 2011 Revision will be included in the Final Draft submitted to the Washington Department of Ecology for final approval.

Form revised: December 6, 2011

FISCAL NOTE FOR NON-CAPITAL PROJECTS

Department:	Contact Person/Phone:	CBO Analyst/Phone:
Seattle Public Utilities	Vicky Beaumont 233-7856	Karl Stickel 684-8085

Legislation Title: A RESOLUTION adopting Seattle's Solid Waste Plan 2011 Revision to the 1998 Plan "On the Path to Sustainability," as amended by the 2004 Comprehensive Plan Amendment.

Summary of the Legislation: The resolution would adopt the 2011 Revision to Seattle's 1998 Solid Waste Plan, as amended by the 2004 Solid Waste Plan Amendment. The Plan provides long-term vision and guides the City's solid waste management programs for the next five years. More specifically, the 2011 Revision confirms the goals, policies and program direction established in the 1998 Plan, as updated by the 2004 Plan Amendment. It describes progress towards established goals and objectives, and identifies strategies for continuing to move towards these goals over the next five years and through 2020. The adopted 2011 Revision will be submitted to the Washington State Department of Ecology for approval.

Background:
State law requires local governments develop solid waste plans and that they be updated every five years. The Washington State Department of Ecology reviews and approves adopted plans. The 2011 Revision has a 20-year horizon, recommending solid waste programs for the next five years, and providing direction for the following 15 years. The City adopted the 1998 Plan "On the Road to Sustainability" in 1998. The 2004 Plan Amendment was adopted by Resolution 30750 in 2005. Funding for particular solid waste programs comes through the Seattle Public Utilities' (SPU's) annual budget process.

The Solid Waste Plan 2011 Revision does not establish new policy direction. The Revision confirms the vision, goals and program direction established in the 1998 Plan, as updated by the 2004 Plan Amendment, but also revises the timeline for achieving some of these goals. The 2011 Revision also summarizes progress since 2004 and describes how Seattle intends to proceed through the year 2020 towards achieving the established goals.

The Plan will continue to be implemented through the 2013-2014 Budget and Capital Improvement Projects (and subsequent years), as well as through other legislation e.g. ordinances adopting solid waste contract amendments. This resolution itself does not make appropriations or change spending, although it does establish programmatic expectations.

More specifically, the 2011 Revision:

- Lays out waste generation trends
- Discusses waste prevention and its transitioning role in managing discards
- Describes what SPU does with typical household and business waste that is produced in

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the city
- Discusses other wastes the SPU system needs to manage
- Spells out the Plan's future and financing
- Makes recommendations for the future affecting Seattle's solid waste system, and for increasing waste prevention and recycling.

Municipal Solid Waste system and facilities recommendations include:
- Staying the course regarding SPU's core system by continuing competitive contracting with private providers for collection, processing and disposal services
- Completing planned infrastructure improvements of rebuilding the two City-owned transfer stations
- Planning for contingencies such as disasters and the Alaskan Way Viaduct closure
- Continuing to monitor and maintain the City's closed landfills

Waste reduction and recycling recommendations include:
- Keeping on with Seattle's current slate of waste reduction and recycling programs
- Adjusting municipal solid waste recycling goal years to align with projected achievement of 60 percent by 2015 and 70 percent by 2022
- Creating for the first time a recycling goal for construction and demolition debris (C&D) of 70 percent by the year 2020
- Increasing education and enforcement targeted to the residential, self-haul, and commercial sectors
- Phasing in disposal bans on target materials such as compostable organic waste, clean wood, plastic film, asphalt roofing shingles, paving material (asphalt, brick, concrete), plastic bags
- Implementing programs for diverting or reducing carpet, junk mail, phone books, pet waste and diapers
- Continuing to build waste prevention activities such as those that foster product stewardship, reuse, sustainable building, on-site organics management, and City green purchasing.

The 2011 Revision discusses service level maintenance strategies for Clean City programs addressing graffiti, illegal dumping, and litter. Seattle is a partner agency in the Local Hazardous Waste Management Plan (LHWMP) for the local management of moderate risk waste (MRW), and contributes by running two MRW collection facilities and other activities under the aegis of LHWMP.

Please check one of the following:

_X_ This legislation does not have any financial implications.

___ This legislation has financial implications.

Other Implications:

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a) **Does the legislation have indirect financial implications, or long-term implications?**
Yes. The legislation has indirect and long-term financial implications. If all the solid waste program recommendations in the Plan Revision were implemented, solid waste budget line items would shift over time. Also, the recommendations will slow the growth of the Solid Waste Fund revenue requirement, compared to staying with current programs. Decisions regarding specific program funding levels would occur via the budget process. Chapter 6, section 6.3 "Financing the Plan" contains a more complete discussion about financing Seattle's Solid Waste System.

b) **What is the financial cost of not implementing the legislation?**
State law requires local governments develop solid waste plans and that they be updated every five years. Adoption of the solid waste plan occurs by legislative action by the Executive and City Council. The financial cost of not having a valid plan in place would be small, at least in the short term. The long term financial costs are unknown.

c) **Does this legislation affect any departments besides the originating department?**
Yes. Implementation of the new goal for recycling of construction and demolition debris (C&D) will require coordination between SPU and the Department of Planning and Development, which regulates development and issues building permits.

d) **What are the possible alternatives to the legislation that could achieve the same or similar objectives?**
It would be possible to develop a more aggressive program implementation timeline. That would require greater near-term implementation costs, but savings would also be realized sooner. The process of developing the Solid Waste Plan 2011 Revision included analyzing multiple possible program changes and timing. The final set of recommendations included in the Plan, and their implementation timeline, represent what SPU and stakeholders believe to be a good balance between aggressively pursuing zero waste goals and feasibility.

e) **Is a public hearing required for this legislation?**
No. A public hearing on the resolution is not required by the State. State solid waste plan guidelines require public involvement for the development of the Preliminary Draft. SPU carried out the Plan's public involvement plan late summer to early fall 2011 and received feedback from hundreds of individuals, several groups, and the Seattle Solid Waste Advisory Committee as part of the process to develop the 2011 Plan Revision (as documented in Appendix C in the Plan).

f) **Is publication of notice with *The Daily Journal of Commerce* and/or *The Seattle Times* required for this legislation?**
No. However, on June 7, 2012 the SEPA Determination of Non-Significance (DNS) for the Plan was published in the DJC, the Seattle Times, and DPD's Land Use Information Bulletin. The DNS was also entered in the Washington State Department of Ecology SEPA Public Information Center SEPA Register.

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g) Does this legislation affect a piece of property?
No

h) Other Issues:
SPU, the Mayor and the Council took the Plan's recommendations and timeline into account in developing and approving Solid Waste Fund budgets for 2013-2014 and solid waste rates for 2013 through 2016, but also adopted some cuts to SPU's 2013-2014 budget. These budget cuts were intended to moderate the solid waste rate increases, but they mean that active monitoring and management will be required on SPU's part to achieve the near-term goal of recycling 60 percent municipal solid waste by 2015. SPU will plan to reallocate funding across its programs within the Solid Waste Fund in 2014-2015 to help achieve this goal and the other goals specified in the Plan.

List attachments to the fiscal note below:
None

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City of Seattle
Office of the Mayor

December 18, 2012

Honorable Sally J. Clark
President
Seattle City Council
City Hall, 2nd Floor

Dear Council President Clark:

I am pleased to transmit the attached proposed Council Resolution that would adopt Seattle's Solid Waste Plan 2011 Revision "Picking Up the Pace Toward Zero Waste." This document will guide Seattle's solid waste management programs for the next five years while providing vision and direction for the following 15 years.

State law requires local governments develop solid waste plans and that they be updated every five years. At a high level, the plan recommends no changes regarding SPU's core service delivery system and continuing competitive contracting with private providers for collection, processing and disposal services. It proposes to change Seattle's solid waste recycling goal years to align with projected achievement of 60 percent by 2015 and 70 percent by 2022 and would establish for the first time a recycling goal for construction and demolition debris. The plan would also phase in disposal bans on targeted materials such as compostable organic waste, clean wood and asphalt roofing shingles.

Funding for particular solid waste programs comes through the Seattle Public Utilities' annual budget process. For 2013, I proposed and the Council endorsed several short-term adjustments to SPU's solid waste budget to moderate the 2013 rate increase. This was appropriate in view of the lingering effects of the recession. However, sustaining the long-term vision of the Plan, and the eventual savings it will bring, will require a commitment from all of us to make the near term investments or prioritizations that will move us down the road to success.

This document has many purposes beyond meeting regulatory requirements. It explains to the public how current and future programs work and helps SPU prepare and run solid waste programs. And it helps City decision makers select among the many options that will increase recycling and pick up the pace toward zero waste. Thank you for your consideration of this legislation. Should you have questions, please contact the Plan's project manager Vicky Beaumont at 233-7856, or Timothy Croll, Solid Waste Director, at 684-7834.

Sincerely,

Michael McGinn
Mayor of Seattle

cc: Honorable Members of the Seattle City Council

Michael McGinn, Mayor
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