On the Path to Sustainability

2004 Plan Amendment

Seattle Public Utilities

December 2004

Seattle's Solid Waste Plan

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Foreword

This 2004 Solid Waste Plan Amendment (Plan Amendment) has been prepared to meet RCW 70.95, which requires counties to prepare comprehensive solid waste management plans. Cities like Seattle, which choose to manage their waste separately from the County government, must write their own comprehensive plans and submit them to the County for incorporation into the County Plan. This process has been followed for the 1988 Plan and the 1998 Plan.

The Washington State Department of Ecology guidelines require that plans be reviewed every 5 years and amended or revised to keep them current. Plan Amendments contain "additions to an existing program or changes that implement a program, rather than define the planning vision."[1]

This Plan Amendment retains the vision, goals, and program direction established in the 1998 Plan, *On the Path to Sustainability*. Key program development areas for the past 5 years were addressed in the 1998 Plan and supporting documents.[2] The combination of ongoing activities, slightly modified or refined programs, and minor additions as described in the 2004 Plan Amendment do not result in any new significant adverse environmental impacts. SEPA compliance is provided by the 1998 EIS. (See SEPA compliance memo in Appendix E.)

It is anticipated that Seattle will prepare a full Solid Waste Comprehensive Plan Revision for 2008.

This Plan Amendment was adopted by Seattle City Council Resolution #... on [date]. (See Appendix F.)

1 *Guidelines for the Development of Local Solid Waste Management Plans and Plan Revisions,* Washington State Department of Ecology (December 1999).

2 Supporting documents are City of Seattle's *Recycling Potential Assessment/System Analysis Model* (1998); *Plan for Seattle's Recycling and Disposal Stations* (August 1998), and *Final Programmatic Environmental Impact Statement* (August 1998).

Executive Summary

Introduction

In August 1998 the Seattle City Council adopted Seattle's Solid Waste Plan *On the Path to Sustainability*. The Washington State Department of Ecology (Ecology) approved the adopted plan in June 1999.

The 1998 Plan established a policy framework of sustainability and stewardship and adopted "zero waste" as a guiding principle. It also identified eight programmatic goals and a package of programs for the future designed to achieve these goals. The planned programs were selected with the intention of balancing the values of public and environmental health, cost-effectiveness and system efficiency, and customer and community needs.

The 2004 Plan Amendment renews Seattle's commitment to these policies and goals, and to the overall program direction adopted in the 1998 Plan.

The Plan Amendment also incorporates the principles of Seattle Public Utilities' "asset management approach" to doing business, which simply involves meeting customer and environmental service levels at the lowest life-cycle cost.

Seattle's People and Their Waste

Seattle's residential population continues to grow slowly. Total population increased approximately 7 percent between 1995 and 2002, and the number of households increased by nearly 5 percent. Employment has grown by more than 10 percent since 1995, despite the recession. Consistent with this growth, total trips to the City's recycling and disposal stations have also increased by more than 8 percent.

Despite these increases in population and employment, total municipal solid waste generation (recycling plus yard debris plus garbage) has not changed, although disappointingly the amount going to the landfill has increased, and the amount recycled and composted has decreased. Total generation in 2002 was 768,274 tons, of which 40 percent was recycled or composted.

In addition, over 160,000 tons of construction materials are separately collected and disposed at private facilities. This has increased by more than 30 percent since 1995. An unknown quantity of Seattle-generated construction and demolition debris is recycled at private facilities.

Data from regular composition studies of disposed garbage show that residential and commercial garbage still contains significant quantities of recyclable paper, food scraps, and compostable paper. Twenty percent of residential garbage now being landfilled could be recycled in the current curbside recycling program.

Amending the 1998 Plan

In accordance with Ecology Guidelines, Seattle has reviewed its 1998 Plan and determined that its current solid waste goals and program direction are the same as they were in 1998. This consistency supports the preparation of a Plan Amendment, rather than a Plan Revision. Seattle Public Utilities (SPU) anticipates that a Plan Revision will be needed in 2008.

The 2004 Plan Amendment reviews progress since 1998 towards the established goals, and describes programs for the next 5 years that are designed to keep Seattle moving towards those goals.

The 2004 Plan Amendment is organized according to the five solid waste business areas for which SPU is responsible:

- Waste Prevention
- Collection, Processing, and Disposal
- Facilities and Operations
- Clean City
- Historic Landfills

Progress on the Path to Sustainability – 1998-2003

Waste Prevention

Since 1998 Seattle has implemented a wide range of waste prevention programs, including reuse events, sustainable building practices and incentives, green procurement policies, and new product stewardship activities.

The City's onsite organics programs—back-yard composting and "grasscycling"—have continued to be popular with single-family residents. Since 1995 the tons of waste diverted to onsite organics management have increased by 35 percent.

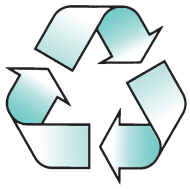
Seattle established a Sustainable Building policy in 2000 and has designed over 2.75 million square feet of City construction to Silver LEED performance standards.

In 1999, Seattle joined with other jurisdictions in Washington and Oregon to create the Northwest Product Stewardship Council (NWPSC). Among other efforts, the NWPSC has advocated for national and regional stewardship programs for electronic waste.

Collection, Processing, and Disposal

In 2000 new residential collection contracts for garbage, yard debris, and recycling established more efficient and more equitable (Citywide) services, and added new materials to recycling. Incentives were incorporated to encourage contractors to sign up multi-family dwellings for recycling.

In 2001 Seattle entered into contracts for commercial garbage collection, replacing the previous franchise system. Commercial garbage rates went down as a result.



Since 1988 Seattle has had the goal of recycling 60 percent of total municipal solid waste generated. Recycling includes yard debris collected for composting or managed on site.

Between 1995 and 2002 the City's overall recycling rate declined from 44.3 percent to 39.7 percent. The decline was primarily due to a decline in commercial recycling from 48 percent to 41 percent. Residential recycling remained almost the same, and recycling at the recycling and disposal stations increased slightly.

Facilities and Operations

The 1998 Plan recognized the inadequacy of the City's recycling and disposal stations to meet today's sustainable waste management needs. The stations are also old and in a state of disrepair, and working conditions are difficult. Despite these challenges, the stations have continued to deal with increasing tons of waste, types of materials, and customers.

In 2002 the recycling and disposal stations handled nearly 330,000 tons of waste, an increase of about 10 percent since 1995. This included contractor-collected garbage and yard debris, as well as over 10 separate material categories from self-haulers for recycling, disposal, or special handling. This waste was brought in by 373,000 vehicle trips, of which over 90 percent were self-haul customers.

SPU workers preparing for a graffiti paint-out.

At the direction of the City Council, SPU prepared a Solid Waste Facilities Master Plan (SWFMP) to address the City's long term-facility needs. This was submitted to the Council in December 2003. Currently the proposal is undergoing environmental review. Implementation will depend on future decisions.

Clean City

Clean City is a set of programs that provide tools designed to abate graffiti, illegal dumping, and litter. In 2003 the Clean City hotline responded to nearly 10,000 calls reporting graffiti and illegal dumping incidents, cleaned up 1,200 tons of illegally dumped material, painted out nearly 22,000 graffiti tags, and supported 189 adopt-a-street groups.

The Clean City program also manages street-side litter can collection, funds litter cleanup in Parks, and participates in the Mayor's Clean Seattle Initiative community cleanup events.

Historic Landfills

SPU provided ongoing monitoring and maintenance at two former landfill sites, Kent Highlands and Midway, which were cleaned up and are now being managed in accordance with regulatory agreements.

SPU also responded to questions or concerns regarding 12 old in-City landfills.

Programs for the Future – 2004-2008

Programs for the next 5 years were developed on the basis of current information about Seattle's residential and business customers, characteristics of the waste stream, and program performance over the past 5 years.

Key objectives are to:

- *Make a renewed commitment to waste prevention and stewardship.*
- *Address the declining recycling rate.*
- *Improve the condition and functionality of Seattle's solid waste facilities.*

In January 2003 the Mayor submitted to the City Council a package of 10 programs designed to address the declining recycling rate and achieve the 60 percent recycling goal by 2010.

This package included waste prevention as well as recycling programs. These programs target materials that are entering the landfill in large quantities and that are currently easily recyclable. They also respond to the needs identified by customers. The nine programs are:

- Commercial sector disposal ban of recyclable paper and cardboard
- Single-family recycling service to businesses
- Collection service for commercial food scraps and compostable paper
- Public place recycling
- Commercial waste prevention programs
- Residential sector disposal ban on recyclables
- Residential waste prevention programs
- Expanded back-yard food scraps composting
- Self-haul reuse and recycling

The City Council passed an Ordinance in 2003 establishing the disposal bans and approved budget to support expanded waste prevention and recycling programs in 2004.

Waste Prevention

In addition to continuing the existing waste prevention programs—reuse, green purchasing, sustainable building, product stewardship, and onsite organics—at current levels, new programs have been developed in accordance with the 60 percent recycling plan. These programs include expanding back-yard food scraps composting, and a wide array of new or enhanced efforts targeting high volume/high toxicity materials in the commercial and residential waste stream.

Public outreach is a key component of the City's 60 percent recycling goal.

Key material targets for new programs include paper products, food scraps, and construction debris, as well as toxic materials (such as mercury) and products containing toxic materials (such as electronics).

Collection, Processing, and Disposal

Collection contracts will continue to provide basic services as currently configured until 2007-2009. Contract amendments are in process to increase service efficiency, improve customer service, and incorporate the new 60 percent recycling programs identified above.

Disposal bans are due to come into effect January 1, 2005, and a campaign is already underway to educate residents and businesses about the bans and to provide technical assistance where needed.

Additional recycling opportunities, such as residential food scraps, will also be considered.

During the next 5 years, recycling programs and the overall 60 percent goal will be evaluated and specifications for the next round of collection contracts will be developed.

Facilities and Operations

The recycling and disposal stations will continue to provide waste transfer and self-haul services while the Solid Waste Facilities Master Plan is under development. To the extent possible within the limitations of the current facilities, operational changes to increase efficiency, safety, and customer service will be carried out. Basic maintenance and facility modifications will also be implemented to improve working conditions and ensure safe and reliable operation.

The SWFMP recommends facility development that is currently undergoing environmental review. Pending the outcome of this review, and a final decision about implementation, new facilities will be designed and constructed.

Clean City

SPU will continue to provide current levels of service in cleaning up litter, graffiti, and illegal dumping. Litter containers will be replaced to ensure reliable program operation, and programs will be reviewed to assess strategies for increasing the efficiency and effectiveness of service delivery.

SPU will implement a public place recycling program in 300 high-pedestrian-use areas to enhance the public face of Seattle's recycling commitment.

Historic Landfills

SPU will continue to manage Kent Highlands and Midway landfills, as well as upcoming construction activities at the sites in accordance with regulatory agreements.

SPU will perform an assessment of the status of old in-City landfills to determine if any additional work is needed.

Chapter 1

Amending Seattle's Solid Waste Plan

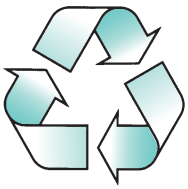
Go confidently in the direction of your dreams!

Live the life you've imagined.

Henry David Thoreau

On the Path to Sustainability

In the 1960s Seattle's solid waste mission was to collect, transfer, and dispose of garbage to protect public health. Today, the mission of solid waste management entities around the world has expanded dramatically. We no longer think of waste management as a linear cradle-to-grave process, but rather as a cycle of renewal. While public health protection from both pathogens and exposure to chemical hazards remains critical, resource conservation and the reduction of environmental harm are recognized as equally important.



In the 1980s and 1990s the focus was on the "three-legged stool" of waste reduction, recycling, and market development—symbolized by the familiar recycling icon. Through the development and implementation of the 1988 Solid Waste Plan, *On the Road to Recovery*, Seattle became one of the earliest cities in the country to make recycling a programmatic priority. In the years following the initiation of its curbside recycling program, Seattle was recognized as a national leader. By the end of the 20th century, recycling had become a standard service and a fundamental customer expectation—not only in Seattle, but also in most other U.S. cities.

The paradigm for the beginning of the 21st century has shifted even farther away from the notion of "waste." Zero Waste, Waste Prevention, Sustainability, and Product Stewardship are the key concepts that drive the contemporary approach to solid waste management. Seattle's 1998 Plan, *On the Path to Sustainability*, incorporates these ideas and reflects the City's broad overall commitment to sustainability.

Piper's Creek at Carkeek Park.

Vision for the Future

The vision of the future laid out in the 1998 Plan (page 4.1) describes a future in which everyone—producer, consumer, business, government, or individual—takes responsibility for the community, environment, and generations "downstream," whether the issue is contamination from disposal, energy and water use, or depletion of resources.

It is a future in which we are beginning to go beyond waste, not only because we understand the importance of stewardship and sustainability, but also because practical choices for sustainable actions are available.

Evolving Waste Management

In preparing this Plan Amendment, Seattle acknowledges other regional and local plans and policies that have emerged since 1998, and which embody the new paradigm. The predominant theme is the increasingly explicit recognition of sustainability and the trend away from the traditional concept of waste management towards a model of resource management and consideration of life-cycle costs and benefits.

We can transition to a society that views wastes as inefficient uses of resources and believes that most wastes can be eliminated.

From the Vision statement for the Washington State Department of Ecology's Beyond Waste Project. See http://www.ecy.wa.gov/beyondwaste for more information.

Other regional and local plans and policies support and strengthen the framework for Seattle's Plan Amendment, and reinforce the goals and principles established in the 1998 Plan. These are summarized below.

State of Washington: Beyond Waste Project – State Solid Waste Plan

As directed by RCW 70.95.260, Ecology is in the process of preparing a new Solid Waste Plan. The plan is part of the Beyond Waste Project,[1] which "will guide Washington in a new direction, from containing and managing wastes towards preventing wastes from being generated in the first place."

The goals of the Beyond Waste Project are to:

- Influence significant reduction of wastes and toxic substances used.
- Shift towards a system where resources are used more efficiently and excess materials are reused as resources.
- Support efforts in Washington State to make sure businesses' needs are met, while protecting the environment.
- Incorporate sustainability principles into waste-related decisions.

Ecology states that "the solid-waste and hazardous-waste plans being developed through the Beyond Waste Project are providing new directions to help guide the residents of Washington towards a more sustainable future." Ecology also recognizes that this is a long-term proposition that will need to be implemented over many years.

Executive Order 02-03: Sustainable Practices by State Agencies

In September 2002, Governor Locke signed Executive Order 02-03, requiring sustainable practices by state agencies, authorizing a Sustainability Coordinator, and establishing a sustainability advisory council. The Order declares the Governor's:

> commitment that state government operations be conducted in a manner consistent with the principles of sustainability and contribute positively towards the quality of life of all citizens.

1 See http://www.ecy.wa.gov/beyondwaste for further information.

A New Path Forward: Action Plan for a Sustainable Washington

In the fall of 2002, Governor Locke convened a Sustainable Washington Advisory Panel and charged it with preparation of an action plan for a sustainable Washington. Steve Nicholas, Director of Seattle's Office of Sustainability and Environment, was a member of the panel. The Action Plan, which was submitted by the Advisory Panel to the Governor in February 2003, states:

> By 2030 Washington will embrace a new path forward in which our communities and the economy are steadily thriving and nature is no longer in peril. Our actions will ensure that following generations can flourish and bequeath to their children a place where they too can experience a rich and fulfilling life.

The Action Plan lays out a number of strategic outcomes for 2030, including the following:

- **No Waste.** By 2030 … what used to be thought of as wastes will actually have become resources to be cycled into new goods or services, or substances that can be harmlessly reabsorbed into our natural systems. Toxic materials will be systematically eliminated from our state.
- **Costs Paid in Full.** Innovative methods of shifting taxes are currently being designed and implemented around the world to more accurately reflect the true costs and benefits of our inputs and activities on natural and social resources. Smart regulations can also be used as incentives for positive change. By 2030 we will take responsibility for the costs of all the inputs, goods, and services we make and use.

The vision … is to achieve a sustainable Washington in one generation.

From the Sustainable Washington Advisory Panel's Action Plan, submitted to Governor Locke in February 2003.

Mayor Nickels' Environmental Action Agenda

Mayor Greg Nickels' 2004 Environmental Action Agenda[2] establishes four integrating themes for environmental action:

- **Healthy Urban Environments:** thriving, diverse nature and neighborhoods
- **Smart Mobility:** efficient, fair, convenient, and clean transportation
- **Strong Environmental Practices:** environmentally responsible practices
- **Lean Green City Government:** efficient and eco-friendly City government

The Environmental Action Agenda includes a number of strategies directly related to sustainable solid waste management practices, including the following:

- Reduce, reuse, and recycle at home and at work.
- Conserve the region's water and energy resources.
- Attract and support businesses that create jobs by developing products and technologies that are good for the environment.

2 See http://www.seattle.gov/mayor/issues/eaa.htm for more information.

- Foster environmental justice by providing city programs and services that serve Seattle's diverse populations.
- Protect and enhance water quality, urban creeks, and salmon habitat.
- Improve air quality and look for local solutions to global warming.
- Promote clean fuels and clean vehicles.

Mayor Nickels' Clean Seattle Initiative

The Mayor recruits the help of kids from Olympic Hills Elementary School in Lake City for the "Clean Seattle" campaign.

The Clean Seattle Initiative is an interdepartmental program that supports the Mayor's priorities of neighborhood safety and healthy communities. Programs related to graffiti abatement, litter and illegal dumping, waste reduction, Adopt-a-Park, Adopt-a-Street, lighting, and other services are part of this initiative. Clean Seattle will educate the public of all ages about urban stewardship and the benefits of a clean and secure community.

City Council Resolution 30316

On July 23, 2001, the Seattle City Council passed a resolution supporting efforts to curb global warming, adopting greenhouse gas emission reduction goals for the City of Seattle, and calling for continuing and new actions towards achieving those goals.

This resolution recognizes the contribution of waste reduction and recycling to greenhouse gas reduction, and includes a commitment to exceed Kyoto Protocol greenhouse gas reduction requirements.

Renewing the Vision

The vision described in the 1998 Plan continues to guide Seattle's policy and program development, and was enhanced in an Assessment of Solid Waste Programs prepared in November 2001.[3]

> 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 and construction debris.
>
> Garbage generation is declining, and 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, and the City's internal waste reduction, recycling, and buy-recycled programs are exemplary.

3 See Appendix A of this Plan Amendment.

> By 2025 there has been a radical shift in how we think about waste. Most products are designed so that they, and/or their component parts, are readily reused or recycled, and with 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.

Zero Waste ***is a philosophy and a design principle for the 21st century. It includes "recycling," but goes beyond recycling by taking a "whole system" approach to the vast flow of resources and waste through human society. Zero Waste maximizes recycling, minimizes waste, reduces consumption, and ensures that products are made to be reused, repaired, or recycled back into nature or the marketplace.***

From the Grassroots Recycling Network at http://www.grrn.org/zerowaste/zerowaste_faq.html

Zero Waste

Seattle's 1998 Plan was one of the earliest solid waste plans in the U.S. to adopt the pioneering principle of Zero Waste.

Since 1998 a number of other agencies and organizations have adopted Zero Waste, including:

- Oregon Department of Environmental Quality, Strategic Plan 2000
- San Francisco, California
- Del Norte County, California
- Santa Cruz County, California
- Toronto, Canada

Product Stewardship/Producer Responsibility

The 1998 Plan envisioned increasing producer responsibility for sustainable waste management practices. Since then, there has been a growing movement around the country in support of product stewardship as a strategy for reducing the adverse health and environmental impacts of consumer products, and the important role of manufacturers in achieving this result.

Seattle and other governments in the Pacific Northwest co-founded the Northwest Product Stewardship Council (NWPSC), which has made our region one of the most involved and effective voices nationally promoting product stewardship.

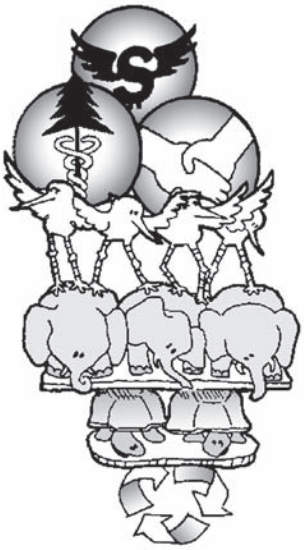
The National Product Stewardship Institute, the Solid Waste Association of North America, the NWPSC, and others have adopted four key principles of product stewardship.[4] Summarized, these are:

- **Responsibility:** The greater the ability an entity has to minimize a product's life-cycle impacts, the greater is its degree of responsibility, and opportunity, for addressing those impacts.
- **Internalized Costs:** All product life-cycle costs—from using resources, to reducing health and environmental impacts throughout the production process, to managing products at the end-of-life—should be included in the total product cost.

4 See http://www.productstewardship.net/aboutDefiningStewardship.html

- **Incentives for Cleaner Products and Sustainable Management Practices:** Product stewardship policies and programs should create incentives for the manufacturer to design and produce "cleaner" products.
- **Roles and Relationships:** Industry should provide leadership in realizing these principles. Government will provide leadership in promoting the practices of product stewardship by addressing regulatory barriers and, where necessary, providing regulatory incentives and disincentives.

Values of Sustainability



Balancing the values making "sus-tain-able" program choices.

Seattle's Comprehensive Growth Management Plan, *Towards a Sustainable Seattle,*[5] incorporates the four core values of:

- Community
- Environmental Stewardship
- Economic Opportunity and Security
- Social Equity

These were incorporated into the 1998 Solid Waste Plan as values to guide the evaluation and selection of programs.

1. To what extent does this program **SUS**tain public and environmental health?
2. To what extent does this program main**TAIN** cost-effectiveness and system efficiency?
3. To what extent does this program en**ABLE** Seattle's communities and support customer and community needs?

Seattle Public Utilities (SPU) emphasizes the importance of evaluating the economic, social, and environmental costs and benefits of programs to ensure that Seattle's citizens are receiving the best value—for now and into the future.

Seattle Public Utilities' Strategic Business Plan

SPU's 2004-2007 Strategic Business Plan reviews its vision, mission, and values, and identifies a series of Strategic Issues and Initiatives in six essential areas:

- Assets and Operating Infrastructure
- Customers
- Employees
- Environment
- Community
- Organizational Excellence

5 Adopted in 1994. See http://www.seattle.gov/dpd/Planning/seattle's_comprehensive_plan/index.asp

Director Chuck Clarke has identified the asset management approach as the central theme of the Strategic Business Plan, stating:

> Asset management simply involves meeting customer and environmental service levels at the lowest life-cycle cost. Asset management and several concepts woven throughout the plan are changing the way we make decisions, including:
>
> - **Triple Bottom Line.** Recognizing that our actions, projects, and programs have social and environmental outcomes as well as financial outcomes. These positive and negative outcomes will be quantified and weighed in decision-making processes.
> - **Life-Cycle Costs.** Decisions regarding projects and programs will be evaluated over the lifetime of the project or program. Costs include the initial development or construction costs, annual maintenance costs, social costs, and environmental costs. Benefits will also be evaluated over the life of the project or program.
> - **Service Level Standards.** Measures of service that are seen by customers as a high priority. These are based on either customer or environmental service levels. These measures will be consistently collected, audited, and reported.[6]

This approach provides a more structured framework for incorporating the "values of Sustainability" into programmatic decisions.

Seattle's Solid Waste Management Goals

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

6 See http://www.seattle.gov/util/About_SPU/Management/History_&_Overview/index.asp for details.

Chapter 2 describes Seattle's people and the wastes they produce, and how these have changed since 1998. Chapter 3 describes the progress that Seattle has made towards the goals established in 1998, see the box below, and Chapter 4 lays out how Seattle intends to make further progress towards these goals during the next 5 years. Chapter 5 provides an overview of SPU's revenues, rates, and expenditures for 2002 and 2003.

Chapter 2
Seattle's People and Their Waste

Study the past if you would define the future.

Confucius

This chapter updates information about the people who produce waste in Seattle, how much they recycle and dispose, and what materials are still going in the landfill.

The changes between 1998 and 2004 help to show how well the programs SPU proposed in 1998 are doing, and, if necessary, how programs should be redirected to address particular materials and/or population sectors.

Who Produces Waste?

Seattle's waste is generated by four sectors:

- Single-family residents
- Multi-family residents
- Businesses
- Self-haulers

Single-Family and Multi-Family Residents

Our residential population grew about 3 percent between 1995 and 2002. As predicted, this growth was greater in multi-family households, although average household size has barely changed. **Table 2-1** shows changes in population and household statistics since 1995.

Population is expected to increase to over 598,000 by 2010, and population density will continue to increase as the number of multi-family households continues to grow.

Table 2-1. *Seattle Population and Household Statistics*[1]

	1995	2002
Total Population	**533,660**	**570,800**
Households		
Single-family thru 4-plex units	148,300	146,040
Multi-family with 5 units or more	101,150	110,853
Total Number of Households	**249,450**	**256,893**
Average Household Size	**2.14**	**2.2**

1 Population data from Puget Sound Regional Council (PSRC). Household data from SPU Curbside and Apartment Recycling Reports at http://www.seattle.gov/util/About_SPU/Recycling_System/Reports/index.asp

Table 2-2. Seattle Employment Statistics[2]

	1995[3]	2002	2008
Manufacturing	63,400	65,300	68,500
Trade	53,100	56,000	55,700
Restaurant	29,400	33,700	37,600
Non-office Service	64,800	72,000	76,300
Office and Government	168,700	194,200	218,700
Health	35,900	37,800	39,400
Food Stores	9,700	9,100	9,900
Education	41,500	46,300	48,900
Total	**466,600**	**514,300**	**555,000**

Businesses

Seattle's overall employment has increased since 1995. The greatest percentage increases have been in the restaurant, office and government, and education sectors. There has not been the dramatic increase in health-related employment, nor the shift away from manufacturing and trade that was predicted in 1998. Past and predicted employment in the different business sectors is shown in **Table 2-2**.

Table 2-3. Self-Haul Trips to the Recycling and Disposal Stations[4]

	1995	2002
Trips to NRDS	202,000	206,706
Trips to SRDS	123,000	146,699
Total Trips	**325,000**	**353,405**
% **"Cars"** (flat rate customers)	**30%**	**16%**
% **"Trucks"** (per ton customers)	**70%**	**84%**

Self-Haulers

Self-haulers are residents and businesses who haul their own wastes and recyclables to the City's North and South Recycling and Disposal Stations (NRDS and SRDS). **Table 2-3** summarizes self-haul trips to the recycling and disposal stations in 1995 and 2002.

Total self-haul trips increased by approximately 9 percent between 1995 and 2002, and the percentage of self-haulers using trucks increased substantially. There are two primary reasons for the noticeable reduction in the percentage of car trips and the increase in the percentage of truck trips:

1. In 1999 the flat rate for cars increased from $8.50 to $14.00 per trip (see Chapter 5).
2. At the same time that rates were increased, the definition of vehicles eligible for the flat rate changed. More vehicle types now fall into the category of per ton customers.

How Much Waste is Produced?

There are several categories of wastes generated in Seattle:

- Municipal solid waste
- Construction, demolition, and land-clearing debris
- Moderate risk wastes

2 Based on Seattle City Light's Economic and Demographic Model (SCLM) Database (2000) and SCLM Forecast (2003).

3 This updates the 1995 employment data shown in the 1998 Plan.

4 SPU Recycling and Disposal Station Reports. See http://www.seattle.gov/util/About_SPU/Garbage_System/Reports/R&D_Station_Trips_&_Tons/index.asp

- Other special categories of waste
  - Biomedical waste
  - Asbestos and asbestos-containing waste
  - Biosolids and sewage sludge
  - Dangerous waste

Municipal solid waste and construction and demolition debris are the main focus of this Plan Amendment (and of previous plans).

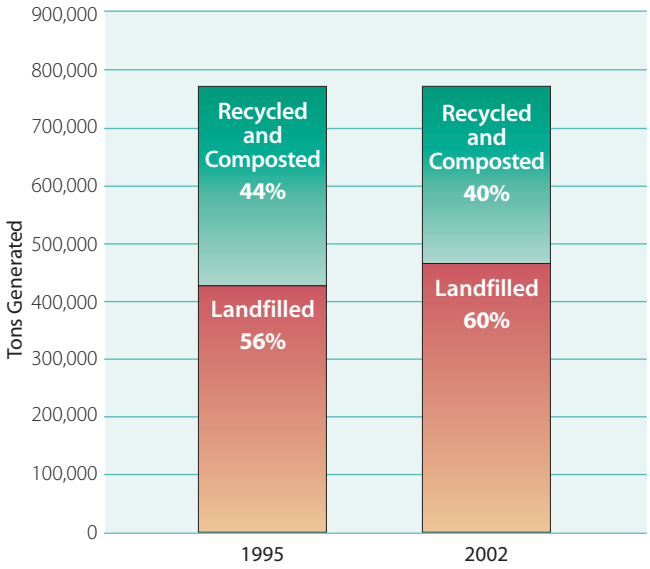
Municipal Solid Waste

Municipal solid waste includes:

- Organic debris managed onsite by residents (yard debris and food scraps)
- All garbage, organic debris, or recyclables that businesses and residents set out for collection
- All garbage, organic debris, or recyclables hauled to the City's recycling and disposal stations

Municipal solid waste includes some disposed and recycled construction materials such as wood and metal.

Figure 2-1. *Total Municipal Solid Waste Generation in 1995 and 2002*



In 2002, 48 percent of municipal solid waste was generated by businesses, 36 percent by residents, and 16 percent was self-hauled to the City's recycling and disposal stations.

Figure 2-1 shows total municipal solid waste generated in 1995 and 2002. Despite the growth in population and employment in Seattle since 1995, the total amount of municipal solid waste generated has hardly changed. However, as the figure shows, the amount of landfilled waste has increased, and the amount of recycled and composted material has decreased.

Figures 2-2 through 2-5 show changes in waste generation, recycling,[5] and disposal for the four population sectors separately. In Figure 2-5, the dashed line shows years for which accurate data were not available.

Waste Generated = Yard Debris + Recycling + Waste Disposed in the Landfill

5 Includes recycling, yard debris, and onsite organics.

Figure 2-2. *Single-Family Generated, Recycled, and Disposed Waste from 1987 to 2003*

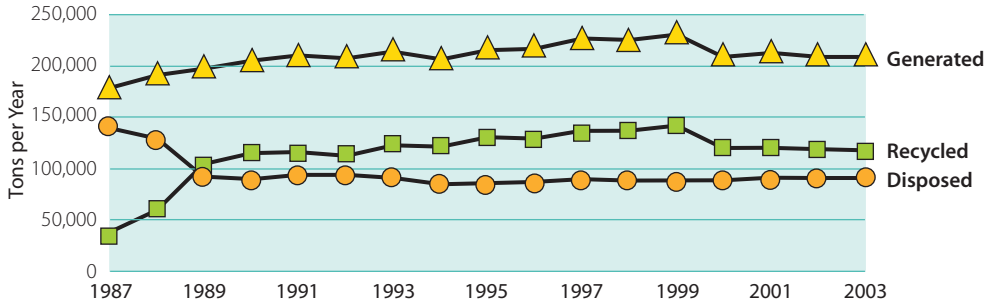


Figure 2-3. *Multi-Family Generated, Recycled, and Disposed Waste from 1995 to 2003*

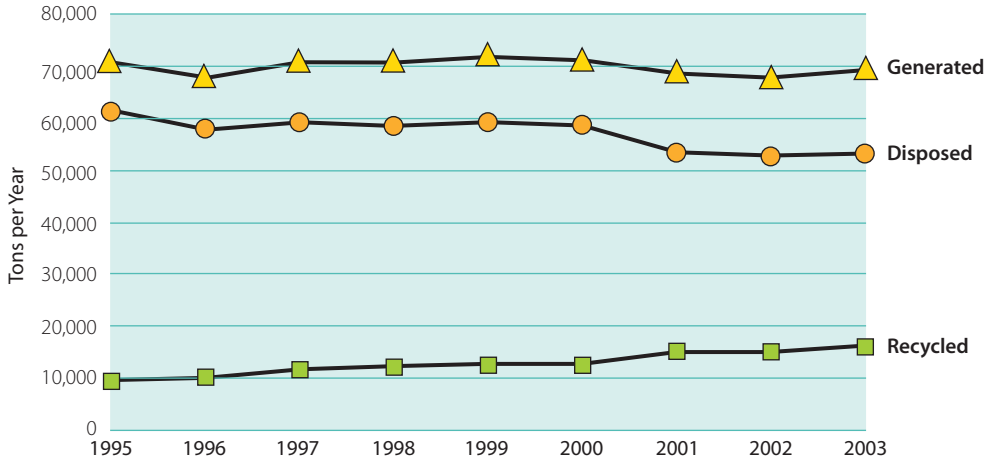


Figure 2-4. *Self-Haul Generated, Recycled, and Disposed Waste from 1995 to 2003*

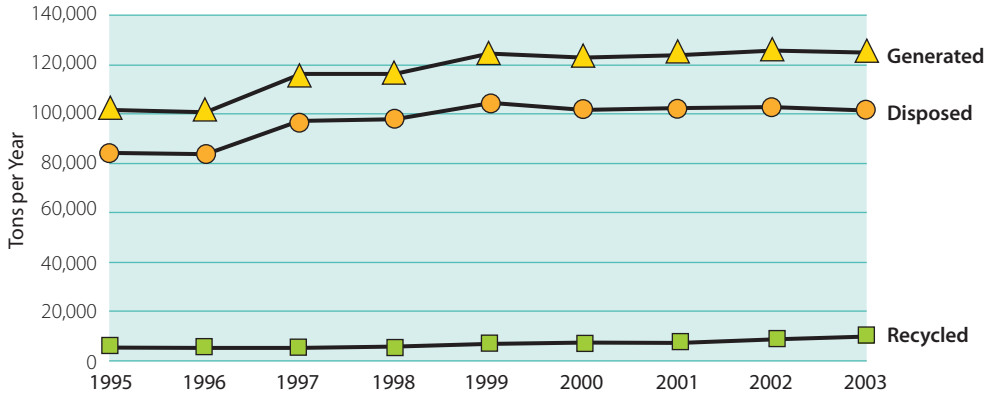
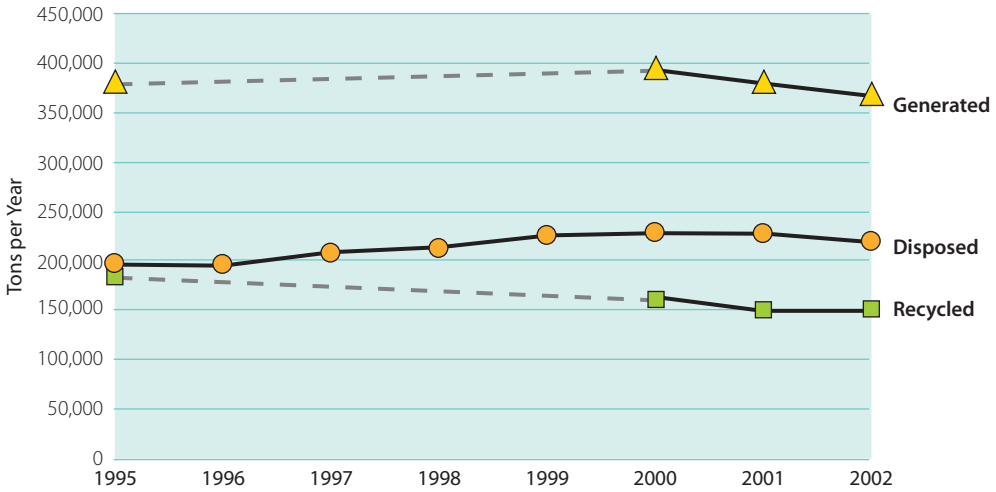


Figure 2-5. *Commercial Generated, Recycled, and Disposed Waste from 1995 to 2002*



Construction, Demolition, and Land-Clearing Debris

Construction, demolition, and land-clearing debris (CDL) includes wood waste, metals, asphalt roofing, gypsum, and other materials that are generated by construction activities and separated from municipal solid waste for disposal or recycling. In 2002 over 160,000 tons of separated CDL from Seattle were disposed at regional landfills. There is no accurate measure of the quantity of CDL recycled and recovered because the City does not track the quantities of materials that flow to these facilities, and because it is hard to distinguish materials that came from Seattle from those that came from outside the city. Seattle does not currently include CDL in its recycling goal or measurements, largely due to the difficulty of measuring the amount that is recycled.

Moderate Risk Waste

Moderate risk waste includes household hazardous waste (HHW) and small quantity generator waste (SQGW). Seattle's moderate risk waste is managed through a joint program supported and implemented by Seattle, King County, the Seattle/King County Department of Public Health, and the Suburban Cities. Moderate risk waste management is addressed in the Local Hazardous Waste Management Plan (1997), a separate plan prepared by the participating agencies.

The Seattle Municipal Code prohibits disposal of HHW and SQGW in the garbage. Despite this prohibition, SPU measured 680 tons of HHW in residential garbage (2002), 4,295 tons of SQGW in commercial garbage (2000), and 928 tons of combined HHW and SQGW in self-haul garbage (2000)—adding up to more than 6,000 tons going to the landfill annually.

In addition, 628 tons of HHW were collected at the City's two HHW facilities, which SPU operates as part of the regional Local Hazardous Waste Management Program. Of the 628 tons, 116 were reused, 237 were recycled, 218 were used for fuel, and 57 were incinerated. Additional quantities of SQGW were also collected for recycling and disposal.

Other Special Categories of Waste

Biomedical wastes are regulated by the King County Board of Health Code.[6] Disposal of biomedical waste in the City's municipal solid waste system is prohibited. Seattle does not permit the disposal of home-generated "sharps" (such as needles) in garbage or recycling containers set out for curbside collection. Some pharmacies and doctors' offices accept "sharps" for proper disposal.

Biosolids (treated sewage sludge) generated at King County's wastewater treatment plants are managed by King County according to federal and state regulations.[7]

6 Title 10, Chapter 10.07.

7 Management strategies are described on King County's Web page at **http://dnr.metrokc.gov/WTD/biosolids/index.htm**

Asbestos and asbestos-containing waste is also prohibited from disposal in the garbage or at the recycling and disposal stations. Selected disposal facilities are authorized to accept properly contained asbestos. The Puget Sound Clean Air Agency regulates the proper removal and handling of asbestos.[8]

Dangerous waste includes toxic and hazardous wastes, generally industrial waste. These wastes are prohibited from municipal solid waste disposal by federal, state, and local regulations. The Washington State Department of Ecology (Ecology) regulates dangerous wastes.

Large quantities of **contaminated soils**, or any material that may be dangerous or hazardous or which has a make-up that is unknown, can be accepted at the recycling and disposal stations if accompanied by a Waste Clearance form from the Department of Public Health.

8 Go to **http://www.pscleanair.org/asbestos/** for information on asbestos removal and disposal for homeowners and businesses.

Chapter 3

On the Path to Sustainability – 1998-2003

Recycle – it's not garbage any more.

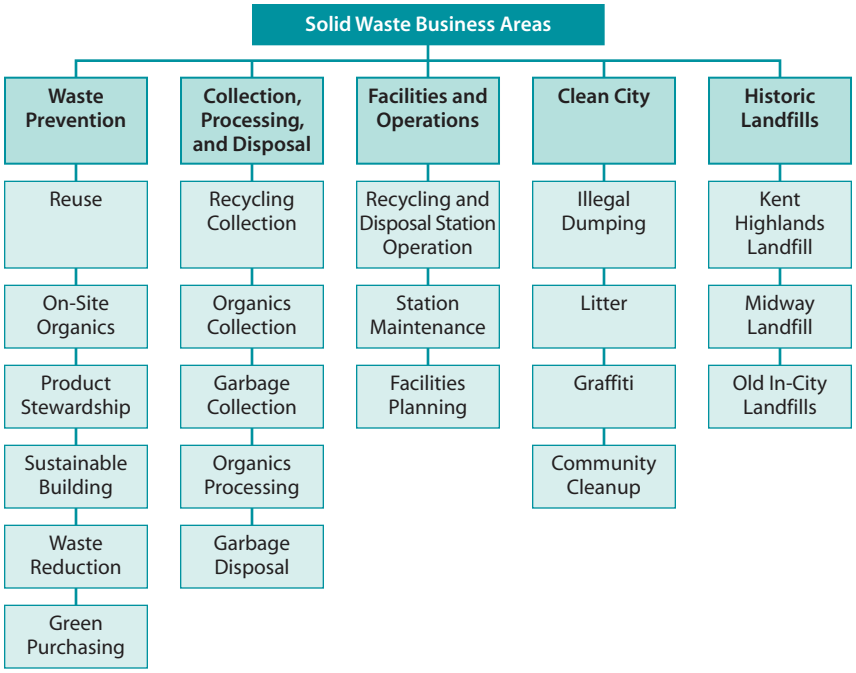
Jenny Bagby, SPU Principal Economist

SPU has five solid waste business areas:

- **Waste Prevention.** Waste prevention means reducing the quantity and toxicity of discarded products and materials, whether discarded for landfilling or recycling.
- **Collection, Processing, and Disposal.** This business area covers services for collection, processing, and disposal of recyclables, organics, and garbage from businesses and residents, plus programs to support these services and maximize diversion from the landfill.
- **Facilities and Operations.** This business area involves operation of the two City-owned recycling and disposal stations and planning for future facility development.
- **Clean City.** Clean City is a set of programs that provide tools designed to abate graffiti, illegal dumping, and litter.
- **Historic Landfills.** Historic landfills include former landfill sites used by Seattle for waste disposal.

Figure 3-1 shows the program categories in each business area.

Figure 3-1. *SPU's Solid Waste Business Areas*



This chapter is organized by business area. It summarizes:

- Relevant goals from the 1998 Plan
- Primary business area objectives over the past 5 years
- Programs that have been implemented since 1998
- Program outcomes

Each section ends with a list of needs and opportunities for making further progress towards our goals.

Before addressing progress in each business area, the following section discusses the City's 60 percent recycling goal, which is relevant in all the business areas except for Historic Landfills.

The 60 Percent Recycling Goal

One of Seattle's critical solid waste goals is the 60 percent recycling goal. This goal was established in 1988 and renewed in the 1998 Plan. The recycling rate is measured as the percentage of total municipal solid waste that is recycled and composted. This includes organics managed onsite through back-yard composting and grasscycling. The 60 percent goal is an aggregate of separate goals for each of the four primary sectors: single-family, multi-family, commercial, and self-haul. The recycling goal for each sector is different because of different material characteristics in their waste streams, different opportunities to recycle, and different expectations about participation.

Table 3-1. City of Seattle Recycling Rates

Sector	1995	2000	2001	2002	Goal
Single Family	61%	58%	57%	57%	**70%**
Multi-family	13%	18%	22%	22%	**37%**
Total Residential	**49%**	**48%**	**48%**	**48%**	**60%**
Commercial	**48%**	**42%**	**40%**	**41%**	**63%**
Self-Haul	**17%**	**17%**	**18%**	**18%**	**39%**
Combined – All Sectors	**44%**	**40%**	**39%**	**40%**	**60%**

In 1995 Seattle's recycling rate was 44 percent. By 2002 it had declined to 40 percent. **Table 3-1** shows the recycling rates for the different sectors since 1995, with the goals for each sector provided in the far-right column.

Figure 3-2. Sector Progress Towards Recycling Goal for 2002

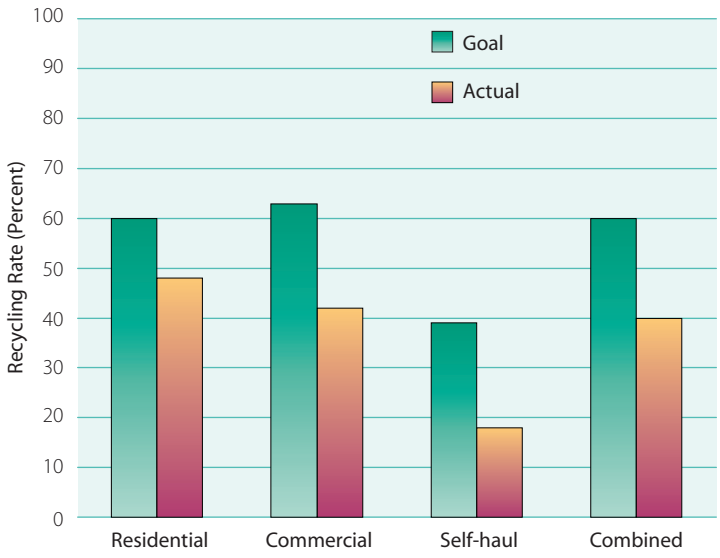


Figure 3-2 compares the 2002 recycling rate for each sector with the sector goal (giving a graphical view of the two far-right columns in Table 3-1).

The following sections discuss progress in each business area since 1998.

Waste Prevention

As shown in Figure 3-1, this Plan Amendment includes programs in the following areas under the overall heading of waste prevention:

- Reuse
- Onsite Organics
- Sustainable Building
- Product Stewardship
- Green Purchasing
- General Waste Reduction

Actions in these categories reduce the quantity or toxicity of material entering the municipal solid waste stream by preventing waste from being generated in the first place, by extending the useful life of products, or by creating incentives for product redesign.

Goals and Objectives

The following goals were listed in the 1998 Plan:

- Increase waste reduction and resource conservation.
- Increase consumer and producer responsibility for sustainable waste management practices.
- Implement the Seattle Sustainable Building Action Plan.

The key objectives for waste prevention over the past 5 years have been to:

- Incorporate waste prevention into the broader conservation message.
- Maximize the impacts of conservation messages by partnering with other agencies.
- Provide technical assistance, tools, and incentives that support and encourage sustainable practices.
- Target high-quantity materials, especially yard debris.

Programs and Outcomes 1998 – 2003

Seattle residents find reusable items at a Use It Again, Seattle! event.

Most of the programs for the future proposed in the 1998 Plan have been implemented. These are discussed below by program area.

Reuse

Since 1998, SPU has expanded the Use It Again, Seattle! Directory concept to create a more comprehensive program that includes an online directory and neighborhood events for swapping reusable items.

In coordination with other SPU programs, the neighborhood reuse events also offer wood chip mulch for home landscaping and accept high-flow toilets for recycling. Local charities are invited to select saleable materials left over at the end of the events to reduce the amount to be disposed.

In 2003, an estimated 500 tons of reusable items were traded at six neighborhood events.

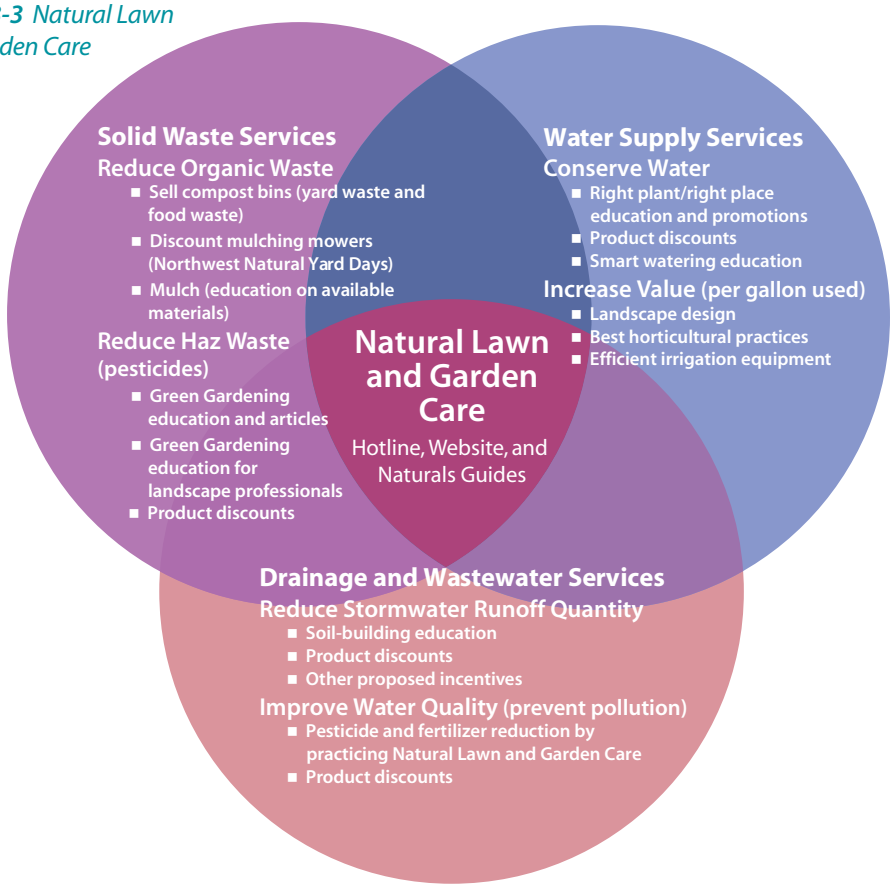
Onsite Organics

The original onsite organics programs, Back-Yard Composting and Grasscycling, have evolved to become integral components of a comprehensive suite of programs delivered under the banner of "Natural Lawn and Garden Care."

This suite of programs, illustrated in **Figure 3-3**, addresses organic waste reduction, pesticide reduction, outdoor water conservation, and efforts to reduce stormwater runoff and improve water quality. The goal is to create a strong awareness of environmentally sound gardening practices and to encourage residents to eventually adopt the full suite of natural lawn and garden care behaviors.

Since 1998, SPU has distributed 15,260 yard debris compost bins and 1,144 bins for kitchen scraps. In the same period, the Natural Lawn and Garden Hotline (shown in the center of the circles in Figure 3-3 and serving all program elements) has responded to over 50,000 calls about composting and other conservation issues. In 2003 SPU distributed over 60,000 Natural Lawn and Garden Care Guides and 20,000 Natural Yard Care brochures.

Figure 3-3 Natural Lawn and Garden Care



As a result of all this effort, participation in back-yard composting and grass-cycling has increased. **Table 3-2** shows the growth in households participating in back-yard organics programs between 1995 and 2000 (the most recent year for which data are available). During this same period, organics managed onsite increased from 19,000 tons per year to 26,600 tons per year.

Table 3-2. Households Participating in Back-Yard Organics Programs in 1995 and 2000[1]

	1995	2000
Grasscycling	28,000	59,200
Back-yard yard debris composting	64,000	72,100
Back-yard food scraps composting	39,000	48,500

Sustainable Building

Sustainable Building incorporates principles, techniques, and materials that conserve natural resources and improve environmental quality through the entire life cycle of a building—planning, design, construction, operation, maintenance, and demolition or deconstruction.

Seattle's Sustainable Building[2] program has matured significantly since 1998—the year the Sustainable Building Action Plan was written. Many recommendations in the Action Plan have been implemented, including the following:

- A Sustainable Building Policy was unanimously endorsed by the City Council and signed by the Mayor in February 2000.
- A broad array of technical assistance programs for the building industry and residential homeowners has been delivered. This includes workshops, seminars, site visits, consultations, brochures, design incentives, and design tools.
- The City Code has been modified to improve sustainable practices, such as requiring space for recycling.

The Sustainable Building program involves three key elements, which are described more fully in the following sections:

1. City Capital Construction
2. Multi-family and Commercial Construction
3. Single-family Residential – Green Remodeling

What is LEED?

LEED is a certification system designed by the U.S. Green Building Council to foster market transformation by rating new and existing commercial, institutional, and high-rise residential buildings.

Levels of green building certification are awarded based on credits earned in five categories: site, energy, material resources, indoor environmental quality, and water.

The City of Seattle is a U.S. Green Building Council member.

For information on LEED, go to **http://www.usgbc.org**

City Capital Construction

The Sustainable Building Policy for City Construction uses the U.S. Green Building Council's LEED Rating System to evaluate City projects and sets a policy goal of Silver Level performance for City-funded projects with over 5,000 square feet of occupied space. Since 2000, 16 City projects, representing 2.75 million square feet, have been designed to Silver LEED standards, and 10 projects have been completed. Preliminary calculations show that these projects will save over $500,000 in annual operating costs.

1 *2000 Home Organics Waste Management Survey* prepared by Cascadia Consulting Group.
2 For more information, go to **http://www.seattle.gov/sustainablebuilding/default.htm**

Multi-family and Commercial Construction

This program includes monetary incentives for construction that complies with LEED or Built Green standards. In addition, SPU offers outreach and technical assistance to designers and builders in the form of consultations, workshops, a recycling directory, and access to a library of information housed at the Department of Planning and Development.

Built Green *is a residential green building rating system, developed by the Master Builder's Association of King and Snohomish Counties in Washington State. It encourages health and environmental protection in single and multifamily new construction, remodels, and community developments.*

For more information, go to http://www.builtgreen.net

Single-family Residential

This newest program element of the Sustainable Building program includes technical assistance and education such as workshops, brochures, and a phone information line.

Since 1998, nearly 2,000 participants have attended SPU-sponsored Sustainable Building workshops and seminars, and 12,500 electronic newsletters have been distributed. In 2003 the City's Sustainable Building website had 102,000 visits, averaging 10 minutes per visit.

Seattle's new Justice Center—Silver LEED rating.

Product Stewardship

In 1998, Product Stewardship was still a relatively new concept in the U.S., although already mature in Europe, Canada, and parts of Asia. The 1998 Plan introduced Product Stewardship as a sustainable solid waste management strategy that links the beginning and the end of a product life cycle.

Product Stewardship *is an environmental management strategy that means whoever designs, produces, sells, or uses a product takes responsibility for minimizing the product's environmental impact throughout all stages of the product's life cycle. The greatest responsibility lies with whoever has the most ability to affect the life-cycle environmental impacts of the product.*

For more information, see http://www.productstewardship.net

In 1998, Seattle and six other government agencies (King County, Snohomish County, Portland Metro, Ecology, EPA Region 10, and Seattle/King County Local Hazardous Waste Management) formed the Northwest Product Stewardship Council (NWPSC), whose mission is "to integrate product stewardship principles into the policy and economic structures of the Pacific Northwest."

In the spring of 2000, NWPSC held the Northwest's first Product Stewardship conference, Products and the Environment, which hosted speakers from around the world. Recently the NWPSC leadership has been expanded to include Kitsap County and the City of Tacoma. Since 1995 NWPSC and its member agencies have engaged in efforts to promote product stewardship for a variety of products, including tires, electronics, mercury-containing products, retail apparel, and the medical industry.[3]

NWPSC and its member agencies supported the National Electronics Product Stewardship Initiative, and Washington State product stewardship legislation for e-waste. The Take It Back Network for unwanted electronics, a partnership with businesses interested in taking back e-waste, is a program co-sponsored by King County, Snohomish County, and Seattle.

3 For more information, go to http://www.productstewardship.net

SPU also participates on the governing council of the Product Stewardship Institute (PSI), a multi-state consortium formed in 2000 "to assist state and local government agencies in establishing cooperative agreements with industry and environmental groups to reduce the health and environmental impacts from consumer product manufacture, use, storage and disposal."

Green Purchasing

Every purchasing decision has environmental impacts. Green purchasing means determining what those impacts are and how they can be reduced. The 1998 Plan recognized that many waste management issues are caused by purchasing decisions made long before the end of a product's life, and committed the City's in-house operations to green purchasing as a waste prevention strategy.

In Seattle, as in many other jurisdictions, early green purchasing efforts involved adopting "Buy Recycled" ordinances that directed City departments to meet certain targets for purchasing and using reusable, recyclable, and recycled-content materials (SMC 3.04.200 [1992, 1993] and Administrative Rules).

Employees at Total Reclaim in Seattle dismantle computers for recycling.

Over time, more attention has been paid to life-cycle environmental impacts of purchases, and particularly to anticipating waste impacts. In 1999, the broader appreciation of "environmental purchasing" was formalized and a Seattle Green Purchasing Policy was adopted as part of the City's Environmental Management System (Policy 6.14).

Since 2000, interdepartmental teams have developed new contracting specifications for City products and vendor services that are designed to reduce toxic substances and waste. The accomplishments of Seattle's Green Purchasing program include new environmental criteria for cleaning products, vendor take-back procedures for electronic equipment, and a joint effort with the State to obtain locally produced and competitively priced 100 percent post-consumer, chlorine-free paper.

Other Waste Prevention Activities

Waste prevention information is provided to the public through regularly repeated messages included in SPU's bill insert *@ Your Service* and in the semi-annual newsletter for residential customers, *Curb Waste & Conserve*.

The Business and Industry Resource Venture is a technical assistance program for businesses that is funded by SPU. The Resource Venture provides fact sheets, case studies, and other information about reducing waste for businesses.

Table 3-3 summarizes the estimated resources dedicated to waste prevention programs in 2003, along with the outcomes. The number of tons diverted from the landfill is measured for the back-yard organics and reuse programs. Tons are estimated for product stewardship based on the weight of computer monitors handled through the *Take it Back Network*.

Table 3-3. *Waste Prevention Costs and Benefits for 2003*

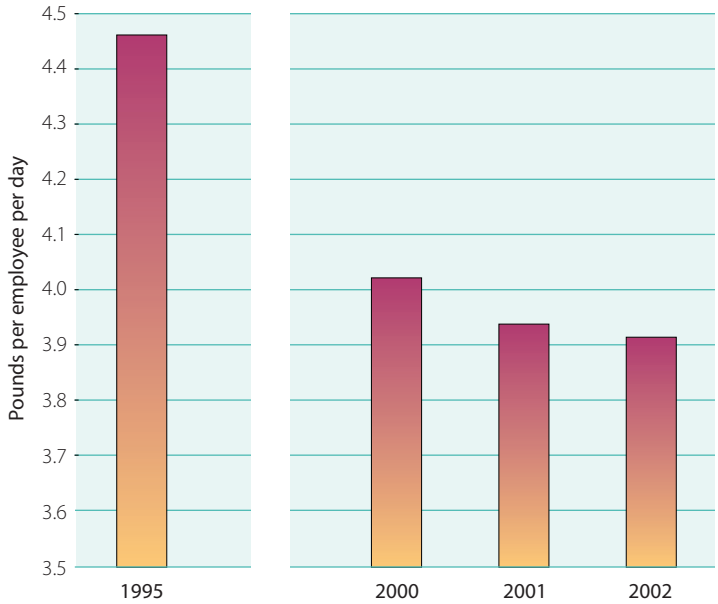
Program Area	Cost	Tons Diverted from Landfill	Toxics Reduced
Reuse	$45,000	500	
Natural Yard Care	$335,000	26,600	Pesticides and fertilizer
Sustainable Building	$402,000	Not Applicable	Wood preservatives, glues, and solvents
Product Stewardship	$100,000	100	Mercury and lead
Green Purchasing	$50,000	Not Applicable	Solvents and mercury

Measuring Waste Prevention

One of the greatest challenges associated with waste prevention is measuring success. Unlike recycling, waste prevention is not tangible and cannot be measured directly as tons handled in some way, but only indirectly on the basis of what was not generated. Less waste generated per person would seem to imply more waste prevention; however, there are many reasons why the amount of waste generated per person changes. These reasons are likely to be small and impossible to separate from other variables, such as changes in household size, movement of particular businesses into or out of the City, product changes, and most notably the state of the economy.

Per employee and per capita reductions in waste generation shown in **Figure 3-4** and **Figure 3-5** likely reflect the downturn in the economy more than the effects of waste prevention. Between 1995 and 2002, commercial per-employee generation has declined by over one-half pound per day, as shown in Figure 3-4.

Figure 3-4. *Commercial Waste Generation from 1995 to 2002*



Between 1995 and 2002, residential per-capita generation has declined slightly, as shown in **Figure 3-5**.

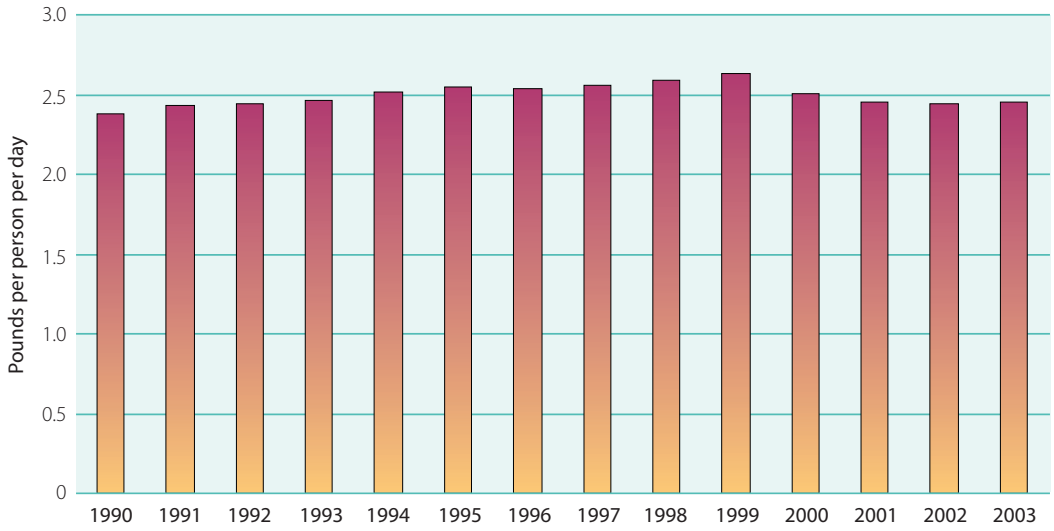


Figure 3-5. *Seattle Residential Waste Generation from 1990 to 2003*[4]

A more satisfactory way to measure waste prevention is to track actual outcomes of specific programs or activities—whether delivered by SPU or implemented by private businesses or individuals with no direct SPU influence.

Needs and Opportunities

- The biggest opportunities for increased waste prevention include high-volume materials in both garbage and recycling, including organics, paper products, and construction debris.
- An earlier generation of SPU-delivered waste prevention programs relied on persuading numerous consumers to change their individual behavior, with limited success. Programs that address institutional change—that is, changing activities within an entire organization—may be more effective.
- Waste prevention is evolving as a component of more multi-dimensional and life-cycle-oriented programs. Sustainable building and natural lawn and garden care programs are intended to conserve waste, energy, and water. Product stewardship looks at resource impacts from the beginning to the end of the product's life. Such efforts are more difficult to measure in terms of solid waste or water conservation costs and benefits, but ultimately represent a more integrated approach to sustainability.
- Better data are needed to measure the costs and benefits of SPU-delivered programs, in order to support future resource allocations. Better data are also needed about non-SPU-sponsored waste prevention activities to better recognize the private contributions of Seattle businesses and residents.

4 Generation = waste recycled, composted, and disposed. In this figure, yard debris data have been "smoothed" to take out the effects of weather (rain).

Programs and strategies to address these needs and opportunities are discussed in Chapter 4.

Collection, Processing, and Disposal

Recycling truck delivers glass to processing center.

Seattle delivers collection, processing, and disposal services for municipal solid waste primarily through contracts with private service providers. The City participates in the overall collection and disposal infrastructure through its ownership and operation of two recycling and disposal stations.

By State statute, Washington cities can be exclusive service providers for collection of all residential municipal solid waste and for commercial garbage, but not for commercial recyclables. Cities may provide recycling services to businesses, but cannot exclude private service providers. Most business recycling, including recycling of construction and demolition debris (CDL), is provided by the private sector.

Services currently provided through City contracts are:

- Residential recycling collection and processing
- Residential yard debris collection and processing
- Residential garbage collection and disposal
- Commercial garbage collection and disposal
- Recycling collection and processing for small businesses
- CDL waste collection

SPU provides billing, customer service, and inspection for residential collection programs. Commercial contractors provide billing and customer service for business garbage customers. Educational outreach to customers associated with collection and disposal are provided by SPU in partnership with service providers.

Goals and Objectives

The following goals were listed in the 1998 Plan:

- Recycle 60 percent of all waste generated in Seattle.
- Increase the efficiency, fairness, convenience, and accessibility of services.
- Expand local markets and increase purchases of recycled-content products.

Key collection, processing, and disposal objectives over the past 5 years have been to:

- Reduce collection system costs and impacts through integration of collection services.
- Maintain or improve high customer satisfaction with collection services.
- Position the City to ensure continued opportunities for competitive collection, processing, and disposal services.
- Landfill nonrecyclable waste.

- Provide incentives that encourage recycling.
- Provide technical assistance and support for recycling programs—especially commercial and multi-family.

Programs and Outcomes 1998 – 2003

From 1988 – 2000, the City managed eight different contracts for collecting residential garbage, yard debris, and recyclables. The recycling collection system and collection frequencies were different north and south of the Ship Canal. Yard debris collection frequencies were different north and south of Yesler.

The 1998 Plan describes the City's intention to reconfigure its residential collection contracts to increase the efficiency, fairness, convenience, and accessibility of services, and to increase recycling.

In 1999 the City awarded new contracts for:

- Residential recycling, yard debris, and garbage collection
- Recyclables sorting
- Yard debris composting

These new contracts replaced the contracts that had been in place since 1989. Key contract changes are summarized in **Table 3-4**. The new services started on April 1, 2000.

Table 3-4. *Summary of Changes to Residential Collection Contracts in 2000*

Contract Changes	Primary Purposes
Every-other-week recycling and yard debris collection frequency citywide	■ More equitable—same frequency for all customers ■ Increased efficiency—fewer collections/year, alternating recycling and yard debris
Recycling carts distributed to all single-family dwellings	■ Increased convenience—customers do not have to call to get a recycling container
Same-day collection of garbage and recycling/yard debris	■ Increased convenience
Recyclables commingled in 60- or 90-gallon containers, except for glass in a separate 10-gallon insert	■ Increased collection efficiency ■ Increased convenience for customers
New materials added to residential recycling: plastic bags, all plastic bottles and tubs, and poly-coated paper	■ Increased recycling opportunities
Incentives for contractors to sign up multi-family buildings for recycling	■ Increased recycling opportunity for multi-family customers
Residential curbside recycling service offered to businesses generating less than 90 gallons of garbage per week	■ Increased recycling opportunity for businesses

The 1998 Plan also discussed the City's intention to contract directly for commercial garbage collection, which was then collected by two private haulers franchised by the Washington Utilities and Transportation Commission. In April 2001, the City asserted authority over commercial garbage collection and entered into contracts for commercial garbage collection.

Collection

Residential

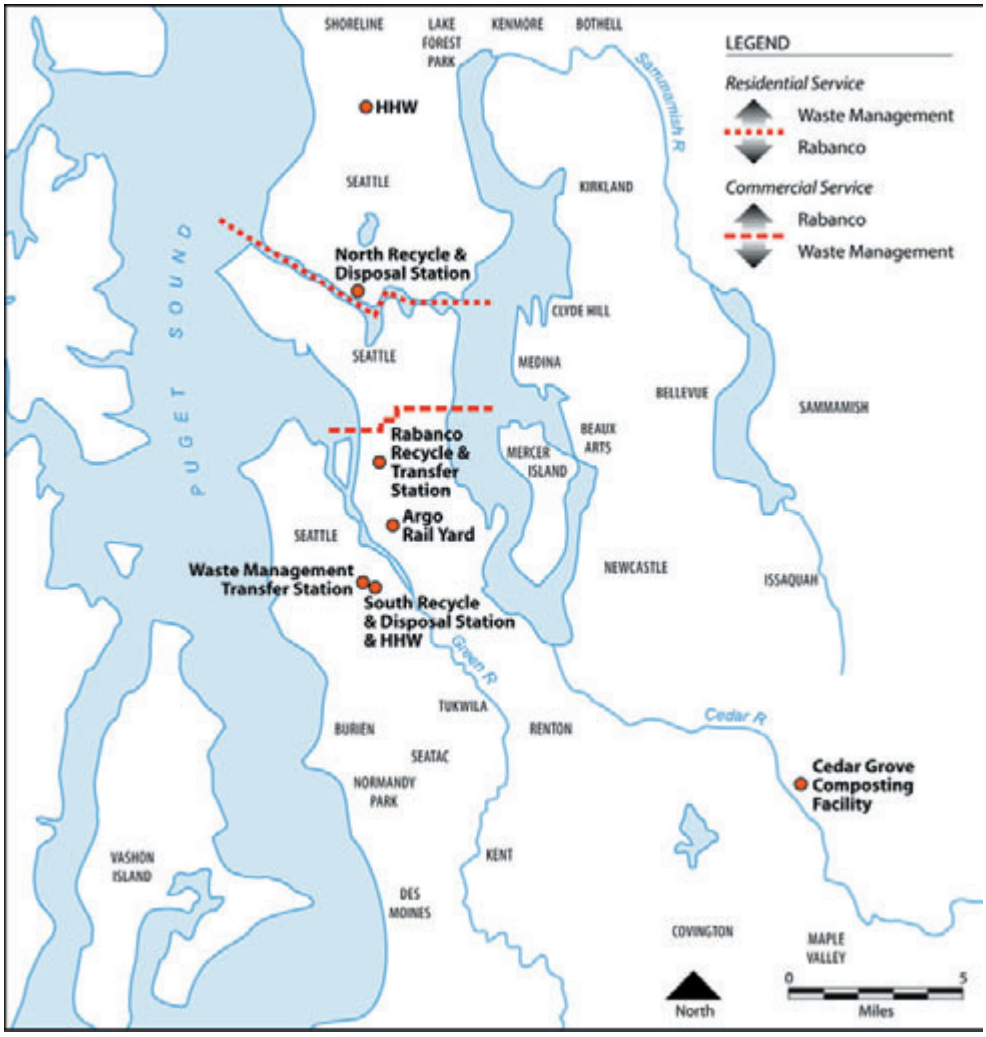
Waste Management serves residential customers north of the Ship Canal, Rabanco (a subsidiary of Allied Waste Systems) serves residential customers south of the Ship Canal (see **Figure 3-6**). Small business recycling is also covered by these contracts.

Waste Management and Rabanco collect residential garbage from 146,000 can customers (mostly single-family) and 5,500 dumpster customers (mostly multi-family). All residents are required to subscribe to garbage service.

Cans are collected weekly. Garbage can sizes range from a 10-gallon mini can to a 90-gallon cart, or more. Currently, 62 percent of can customers subscribe to one can/week garbage collection, and 30 percent subscribe to one mini or micro cans/week. Garbage rates are variable depending on can size (see Chapter 5).

Dumpster customers can choose dumpster size and collection frequency. Garbage rates are variable depending on size and frequency of pick up (see Chapter 5).

Figure 3-6. *Transfer and Processing Facilities*



Residential garbage is delivered to the City's North and South Recycling and Disposal Stations (NRDS and SRDS), where it is compacted and transported to the Argo Rail Yard for shipment to Waste Management's regional landfill in Arlington, Oregon.

Recycling service is offered at no additional charge to residential households. Under the new contract, all single-family residences receive a 64-gallon wheeled container and a 10-gallon insert for glass bottles and jars. Multi-family premises receive recycling dumpsters or carts on request, with 90-gallon carts for glass.

The commingled recyclables are collected from single-family households every other week on the same day as garbage collection. Multi-family recycling is collected on an as-needed frequency.

Friends of Recycling, ***or FOR, is an ongoing SPU program that seeks volunteers to educate others about recycling and to monitor recycling bins at their apartment or condominium building.***

For more information, go to http://www.seattle.gov/util/Services/Recycling/Recycle_at_Your_Apartment/VOLUNTEER_200312020809383.asp

Under the new contracts, the City established targets and provides incentive payments to Waste Management and U.S. Disposal II for signing up new multi-family accounts. SPU also offers incentives to multi-family residents and apartment managers to help encourage more recycling:

- A free, reusable recycling bag distributed to all multi-family housing units
- A $100 rebate for apartment managers who identify a Friends of Recycling (FOR) contact in their building to monitor recycling

Starting in 2000, the curb/alley residential recycling service was also made available to businesses that generate 90 gallons or less of garbage per week.

Single family residents and multi-family buildings may also choose to sign up for yard debris collection. There is an additional charge for this service (see Chapter 5). Yard debris is collected from the curb every other week—alternating with recycling collection. Yard debris has been banned from residential garbage disposal since 1989.

Table 3-5 summarizes Seattle's curbside yard debris collection program under the new contracts.

Table 3-5. Program Parameters for City-Sponsored Yard Debris Collection

Program Parameter	Curbside Collection
Materials accepted	Plant materials such as leaves, grass clippings, twigs, and prunings—not to exceed 4 feet in length and 4 inches in diameter
Types of containers	32-gallon durable containers, 32-gallon kraft paper bags, reusable 32-gallon woven polypropylene bags, bundles (up to 4 feet in length and 2 feet in diameter); no plastic bags
Frequency of collection	March to November, biweekly; December to February, monthly
Quantities	Up to 4 units per collection, March to November; up to 8 units per collection, December to February
Number of subscribers in 2002	56% (89,775 out of 159,600 eligible single-family and multi-family accounts)

Commercial

In 2001, the City entered into contracts with Waste Management and Rabanco (a subsidiary of Allied Waste Systems) for commercial garbage and construction and demolition (CDL) waste collection. The City now sets rates for commercial garbage and CDL waste, and directs commercial garbage to transfer facilities. The contracts run for 7 years, with options to extend service 2 additional years. Rate setting authority for commercial garbage collection shifted from the WUTC to the City Council with these contracts.

Under the new contracts, Waste Management is the primary service provider south of downtown, and Rabanco is the primary service provider in the downtown area and in north Seattle (see Figure 3-6). To keep the quality of service competitive, business customers may choose either of the commercial garbage contractors. However, the fee for service is higher if the business chooses a provider outside of their primary service area.

Garbage collection service is optional for businesses, who may choose to self-haul their waste. Those who sign up for collection may choose a wide range of container sizes and collection frequencies to meet their needs (see Chapter 5 for more information).

Prior to 2001, all commercial garbage was delivered to Waste Management's Eastmont Transfer Station or Rabanco's Recycling, Transfer, and Intermodal Facility. The new contracts require contractors to deliver a percentage of garbage to the City's NRDS and SRDS. This percentage increases through the term of the contract. By year 7 (2008), the City will be able to direct up to 40 percent of commercial garbage to the NRDS and the SRDS.

Like the franchises that were in effect before 2001, the new contracts cover all nonrecyclable waste—including nonrecyclable CDL waste. A load of CDL debris is defined as recycling if it contains no more than 10 percent nonrecyclable contaminants. Loads of recyclable construction debris that fall under this threshold of contamination are eligible for collection by any private recycling service provider.

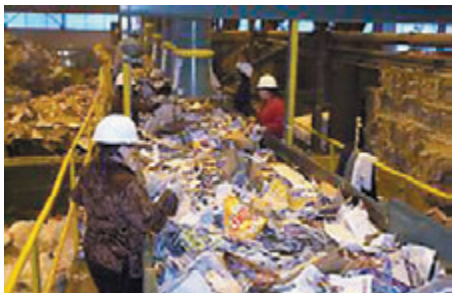
Most commercial recycling is provided by private companies. Depending on the quantity and type of materials being recycled, businesses that recycle may receive revenue, may receive free collection, or may pay a fee. Increased recycling reduces garbage disposal needs. Most businesses can reduce their overall solid waste management costs by recycling, especially if they reduce their garbage service levels.

As described above, in 2000 the City started to offer curbside recycling service to businesses generating no more than 90 gallons of garbage per week. Six hundred out of 1,500 eligible businesses have signed up for this service.

Recyclables and Yard Waste Processing

All recyclables collected through City-sponsored contracts are delivered to Rabanco's 3rd and Lander materials recovery facility for sorting and consolidation. All collected materials must be sold for recycling and not sent out for disposal.

Upon collection, the recyclables become the property of the contractors, who keep the revenues from selling the recycling commodities. Starting in 2000, the City accepted the full risk of changes in market prices for recyclables. The new contracts include a baseline value for each commodity. Each month, local market prices are determined. If the price for a commodity is higher than the baseline value, the City benefits. If the price is lower, it is a cost to the City.



Sorting recyclables at Rabanco's processing facility.

Contractors deliver yard debris to City or private transfer facilities for consolidation and transport to the Cedar Grove Composting Facility in King County southeast of Renton. The City has had a contract for processing yard debris at Cedar Grove since the facility opened in 1989. The present contract is effective through March 2008 and is extendable for two successive one-year periods to March 2009 or March 2010. Under the contract, Cedar Grove is obligated to process yard debris into a marketable soil amendment product.

Garbage Disposal

Since 1990 the City has had a contract with Washington Waste Systems (Waste Management) for rail haul and disposal of all nonrecyclable waste at its Columbia Ridge Landfill in Gilliam County, Oregon. The disposal contract expires in 2028, but the City has various opt-out dates before then.

Compacted garbage is hauled to the Argo Rail Yard and loaded onto the train. Trains leave Seattle 5 times a week with 100 "piggybacked" containers on 50 railcars. The active part of the landfill occupies 640 acres divided into 20 cells, with only one cell being filled at a time. The landfill site has been operating since 1990 and is permitted and regulated by the Oregon Department of Environmental Quality.

Education and Outreach

Residential

SPU continues to educate and involve the public through its annual collection calendar, various bill inserts, and the biannual *Curb Waste Times*—now called *Curb Waste and Conserve* to reflect the integration of conservation services in SPU. This publication highlights changes in collection services, recycling options for materials, and waste reduction strategies.

SPU developed a popular web-based Recycling IQ game that features digital images of all recyclable materials. Around 5,475 people played the Recycling IQ Game in 2003, learning in about 5 minutes what can and cannot be recycled in Seattle.

In 2003, SPU staff answered more than 300 e-mail questions about recycling. Most of these questions were directed to *Ask Evelyn,* the recycling advice columnist Evelyn the Envelope, who is featured in the Recycling IQ game and Recycling IQ posters.

To make participation in recycling more convenient for apartment dwellers, SPU mailed out 77,000 Blue Bags to individual apartment units in 2003. The Blue Bag is a 4-gallon woven polypropylene bag with different enclosures for keeping glass separate from other recyclables such as paper, cardboard, cans, and bottles. The bags are meant to provide an easy way for apartment dwellers to carry recyclables to their outside recycling containers. Another 5,000 Blue Bags were distributed by the contractors to new apartments that signed up for recycling in 2003. The bags are also available at retail outlets.

Commercial

For the last decade, SPU has provided outreach and technical assistance to support commercial sector recycling, primarily through the Business and Industry Resource Venture. This program:

- Supports an on-line database of recycling services.
- Directly assists around 500 businesses per year.
- Publishes a semiannual newsletter that is distributed to 7,400 businesses.
- Promotes recycling of target wastes, such as cardboard; food waste; and construction, demolition, and land-clearing (CDL) debris.

Resource Venture

See http://www.resourceventure.org/rv/index.php for details.

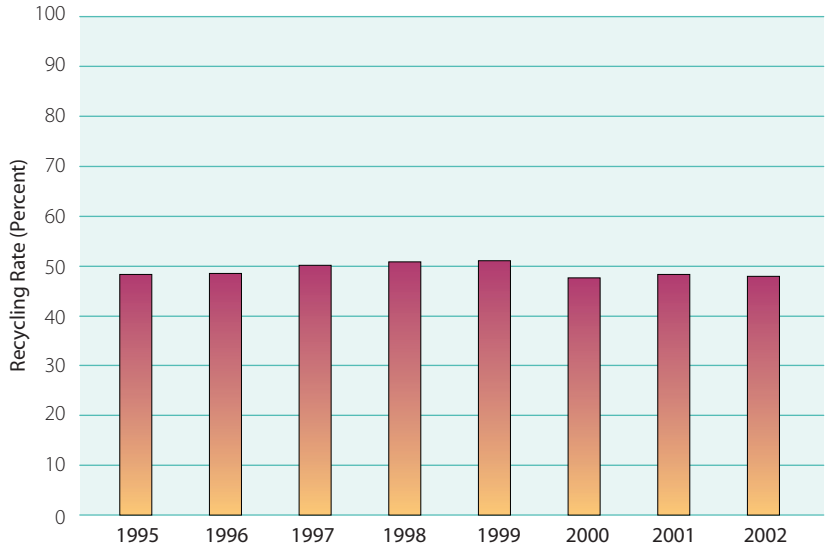
The Resource Venture's most recent focus has been education and outreach on recycling services for property managers.

Outcomes

Residential

As shown in Table 3-1, the overall residential recycling rate was almost the same in 2002 as it was in 1995. However, residential recycling rates were showing an upward trend until 1999 and have since declined, as shown in **Figure 3-7**.

Figure 3-7. Residential Recycling Rates from 1995 to 2002

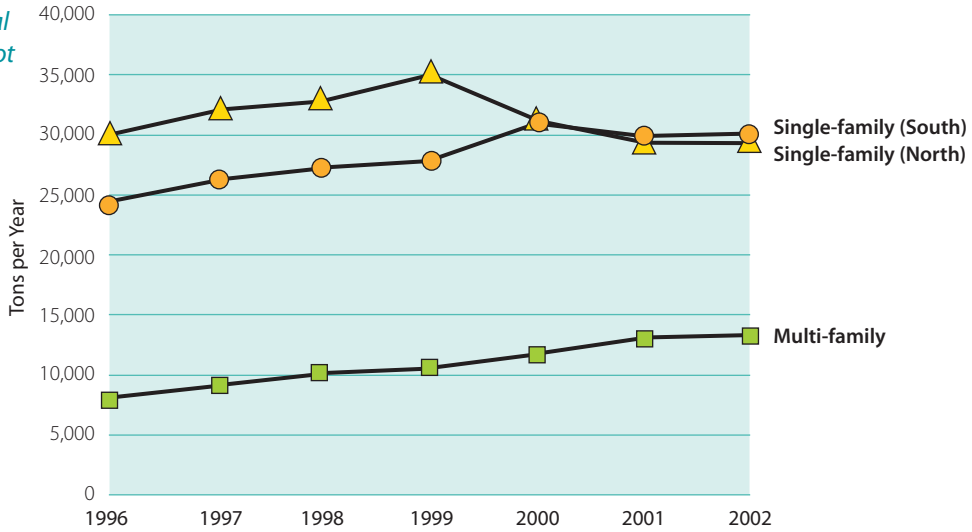


These recycling rates include yard debris diversion, which has remained high partly due to the yard debris disposal ban which has been in effect since 1989.

Since 1998 the quantity of yard debris set out for collection averages around 36,000 tons/year, ranging from 34,000 tons to 40,000 tons. Some of the annual variability is due to rainfall—when it is wetter, there is more yard debris.

Figure 3-8 shows that when yard debris is taken out of the picture, recycling has increased in multi-family units and by single-family residents south of the Ship Canal. The overall decline in residential recycling is due to reduced recycling by single-family residents north of the Ship Canal (see also Figures 2-2 and 2-3).

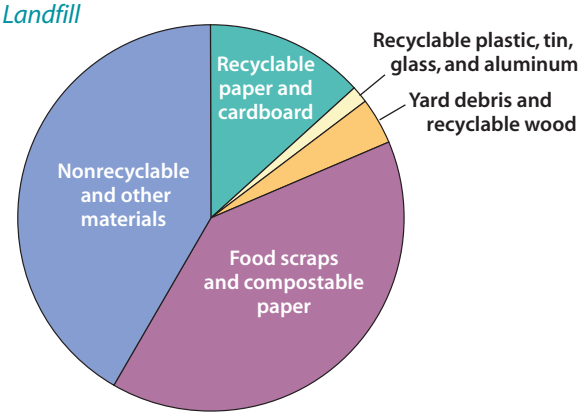
Figure 3-8. *Residential Curbside Recycling (not including yard debris)*



The changes in single-family recycling may be due to changes in collection frequency associated with the new contracts. In the north end, recycling service changed from weekly source-separated collection to every other week commingled collection. In the south end, recycling services went from commingled monthly collection to commingled every other week collection.

Multi-family recycling increases are likely attributable to incentives in the new contracts for multi-family signup, higher garbage rates, and increased promotion focused on multi-family households.

Figure 3-9. *Composition of Residential Waste Going to the Landfill*

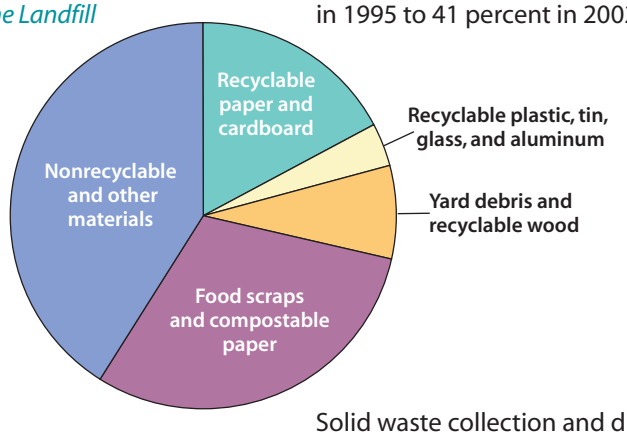


Although recycling is free, convenient and available to all residents, 19 percent of the garbage going to the landfill is made up of paper, cardboard, recyclable containers, and yard debris. In addition, 40 percent of the disposed residential garbage is food scraps and compostable paper. **Figure 3-9** shows the composition of the residential garbage going to the landfill.[5]

5 *2002 Residential Waste Stream Composition Study* prepared for SPU by Cascadia Consulting Group (August 2003).

Commercial

Figure 3-10. Composition of Commercial Waste Going to the Landfill



The percentage of commercial waste that is recycled has declined from 48 percent in 1995 to 41 percent in 2002, as shown in Table 3-1. The reason for this decline is not clear.

Figure 3-10 shows the composition of commercial waste still being landfilled.[6] Twenty-nine percent of commercial waste being landfilled is paper, cardboard, recyclable containers and yard debris. A large percentage of the remaining waste is food scraps and compostable paper.

The overall decline in generation can probably be attributed to the recession. The reason for the decline in recycling is not known.

Solid waste collection and disposal comprise the largest single expense for the solid waste fund. Contract payments and contract management costs plus promotional and outreach activities amounted to about $60 million in 2003. Recycling costs less than garbage disposal. In 2001, for every ton of residential waste that was recycled instead of disposed as garbage, rate payers saved approximately $50.

Needs and Opportunities

The 60 percent recycling goal depends primarily on residential and commercial recycling collection. Self-haul recycling and waste prevention account for only about 10 percent of the overall goal.

The greatest opportunities for moving closer to the 60 percent recycling goal are:

- Materials for which recycling is readily available that are still going in the landfill—particularly recyclable paper and cardboard
- Materials for which recycling collection and processing capability have become more available and cost-effective in recent years—specifically food scraps and compostable paper

CDL (defined in Chapter 2) is not included in Seattle's 60 percent recycling goal, but CDL materials are increasingly recyclable. Establishing a CDL recycling goal would help to acknowledge the significance of this component of the waste stream, and the benefits to be gained by increased CDL recycling.

The current generation of collection contracts is based on the technologies and needs identified in the late 1990s. There is an opportunity to examine alternative strategies for the next generation of collection contracts that will start in 2007–2009.

Programs and strategies to address these needs and opportunities are discussed in Chapter 4.

6 *2000 Commercial and Self-Haul Waste Streams Composition Study* prepared by Cascadia Consulting Group for SPU.

Solid Waste Facilities and Operations

The City owns and operates two recycling and disposal stations (NRDS and SRDS) that provide transfer service for contractor-collected garbage and yard debris, as well as drop-off service for self-haulers.

Customers queuing at the South Recycling and Disposal Station.

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

As solid waste management has evolved over time, the functions of the recycling and disposal stations have expanded dramatically, yet the basic buildings and facilities have not changed. Today the recycling and disposal stations accept over ten categories[7] of separated material—from garbage to wood waste to vehicle batteries.

Typically, transfer facilities are designed to last for 30 years. Seattle's recycling and disposal stations have exceeded this life span, despite limited maintenance. Overall they are outmoded in terms of design to meet functional needs, are inadequate to handle today's volume of materials and customers, and are dilapidated.

In August 1998, SPU published a plan for Seattle's recycling and disposal stations, presenting facility options consistent with the 1998 Plan. This plan identified critical short-term improvements needed to ensure the continued integrity and reliability of the recycling and disposal stations. It also proposed the development of a new reuse/recycling center at the SRDS site.

SPU also operates two household hazardous waste (HHW) collection facilities—one at the SRDS and one at a separate location near Aurora Avenue and North 125th.

Goals and Objectives

The 1998 Plan included the following goals related to solid waste facilities and operations:

- Increase the efficiency, fairness, convenience, and accessibility of services.
- Recycle 60 percent of all waste generated.

During the past 5 years, the following key objectives for solid waste facilities and operations have been to:

- Provide a wide range of services to customers as efficiently as possible given the limited facilities.
- Manage the stations to minimize neighborhood impacts.
- Maintain the stations to ensure continued operation.
- Develop a long-term plan for facility improvements.

7 Recycling and disposal stations accept garbage, yard debris, appliances, paper, plastic, glass, metal, wood, tires, vehicle batteries, and used motor oil.

Programs and Outcomes – 1998-2003

Customer Services

Table 3-6 summarizes the transfer services provided by NRDS and SRDS for contractor-collected garbage and yard debris in 2002. **Table 3-7** summarizes self-haul services provided by NRDS and SRDS in 2002.

Table 3-6. Contractor-Collected Tons and Trips to NRDS and SRDS in 2002

	NRDS		SRDS		Total	
	Trips	Tons	Trips	Tons	Trips	Tons
Residential garbage	6,667	44,519	13,270	97,432	**19,937**	**141,951**
Commercial garbage	3,899	31,155	1,062	8,219	**4,961**	**39,374**
Yard debris	1,371	9,117	1,595	8,332	**2,966**	**17,449**
Total	**11,937**	**85,342**	**15,927**	**113,983**	**27,864**	**198,774**

Table 3-7. Self-Haul Tons and Trips to NRDS and SRDS in 2002

	NRDS		SRDS		Total	
	Trips	Tons	Trips	Tons	Trips	Tons
Self-haul garbage	143,943	55,917	104,959	46,974	**248,902**	**102,891**
Self-haul yard debris	34,055	7,844	25,187	6,522	**59,242**	**14,366**
Self-haul wood waste	2,362	1,122	1,858	944	**4,220**	**2,066**
Other self-haul recycling	21,541	3,297	10,842	3,000	**32,383**	**8,363**
Total	**201,901**	**68,180**	**142,846**	**57,440**	**344,747**	**127,686**

As shown in these tables, contractor trucks bring in 1½ times as many tons as self-haul customers, yet they make up only 7 percent of the total trips. One of the primary challenges at the recycling and disposal stations is managing the high volume of self-haul customers. Although handling this high volume of customers with relatively small loads is relatively costly, providing convenient and accessible self-haul services for the City's residents and businesses is an important SPU objective.

In 2002 about 50 percent of contractor-collected yard debris was delivered to the City's recycling and disposal stations. The remaining 50 percent was delivered to Rabanco's transfer facility. One hundred percent of residential garbage was transferred at the City recycling and disposal stations, but less than 20 percent of commercial garbage was transferred. The rest was delivered to private transfer stations.

Figure 3-11 shows the tons of self-haul garbage, recycling, and yard debris brought to the recycling and disposal stations since 1995. Eighteen percent of self-hauled material is recycled and composted. Overall, self-haul tonnage has increased nearly 25 percent. During the same time, the number of self-haul customer trips has increased almost 10 percent.

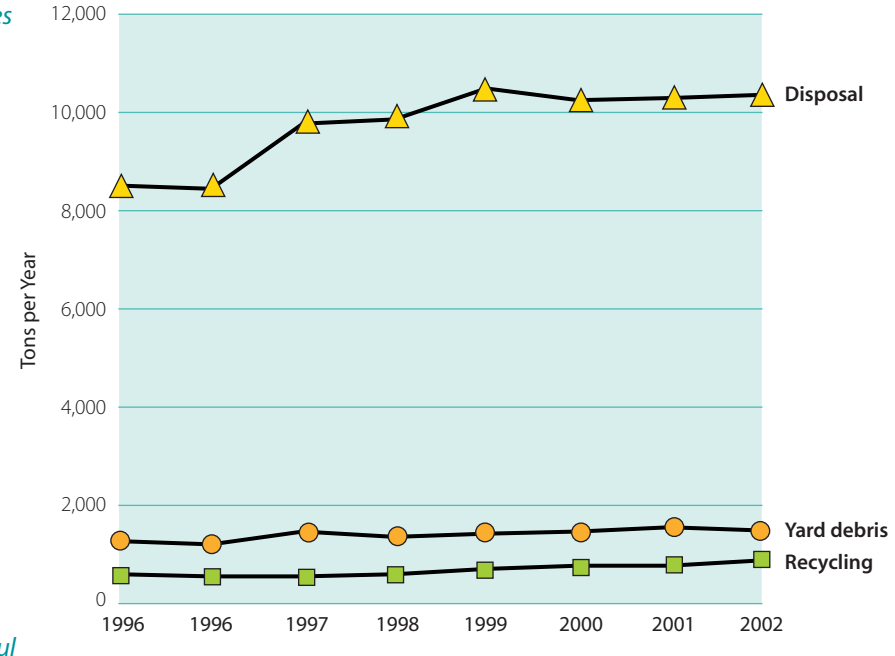


Figure 3-11. *Changes in Self-Haul Tonnage from 1996 to 2002*

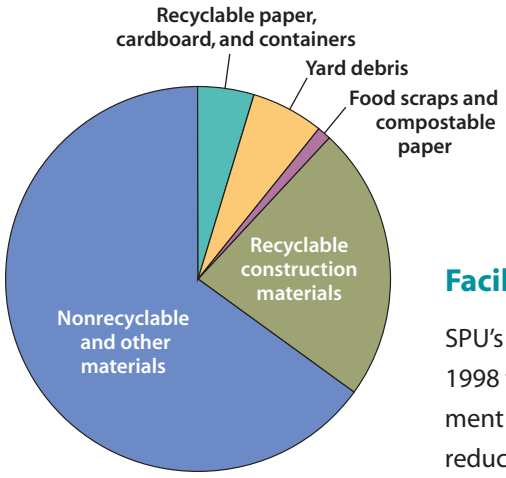


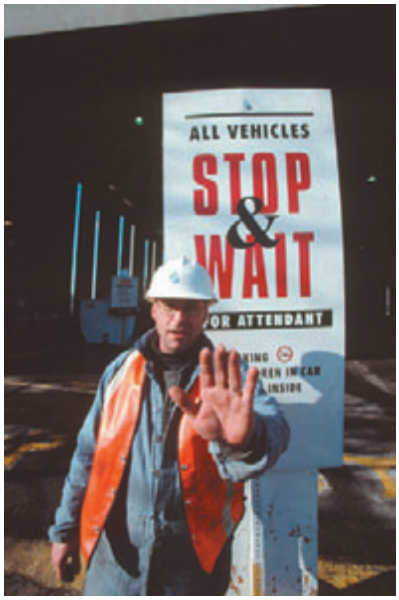
Figure 3-12. *Self-Haul Waste Composition*

The composition of self-haul waste that is being landfilled is shown in **Figure 3-12**. Nearly one quarter of this is recyclable construction waste, such as clean wood, metal, new gypsum scrap, and concrete. Currently, there is only room at the recycling and disposal stations to recycle metal and wood scraps. Previous survey work indicated that small construction businesses would value a single "one-stop" location to bring recyclable construction debris.

Facility Operations

SPU's Solid Waste Field Operations has made several process changes since 1998 to improve efficiency, increase reliability, and create a safer environment for customers and staff. These operational modifications have reduced operating costs, even though the demand for service (total tonnage and trips) has increased. The changes are summarized below:

- In 1997 SPU began maintaining most equipment with internal labor and developed a database/invoice tracking system for all maintenance. This system was fully implemented in 1998 and resulted in decreased maintenance costs and more accountability for work performed by vendors. It has allowed SPU to make better-informed decisions on equipment replacement scheduling.
- The new residential collection contracts direct more residential garbage and yard waste to the SRDS, with less going to NRDS than under the previous contracts. This has resulted in a significant decrease in hauling costs as distances to the Argo Rail Yard and to Cedar Grove are shorter from the SRDS than from the NRDS.



A station attendant directs traffic at a recycling and disposal station.

- Truck scales were added to the loading bays for yard debris in 2000, allowing for higher payloads and lower risk of sending out overweight trucks. The previous operational practice required an employee to monitor each load of collected yard debris and estimate the weight. Use of truck scales has improved both efficiency and safety.
- Beginning in 2003, container weights were monitored to reduce the number of underweight containers leaving the facilities. The City is charged for at least 25 tons of waste per intermodal container delivered to the Argo Rail Yard, even if it contains less. Operations staff effectively reduced the incidence of underweight containers, saving $88,000 in 2003.
- Station hours were adjusted in 2003 to simplify operations and make the City facility hours consistent with King County solid waste facilities. This has improved customer service and safety associated with consistent staffing levels.
- More effort has been spent on researching replacement options for aging capital equipment, which has resulted in the selection of more efficient equipment. Ergonomic improvements have also been incorporated.

Rehabilitation Projects

Many of the short-term rehabilitation projects recommended in the 1998 Plan for Seattle's recycling and disposal stations have been completed. Others have been deferred pending implementation of the Facilities Master Plan (see Chapter 4). **Table 3-8** shows the facility improvements that have been completed since 1998.

Operations and maintenance costs for the two recycling and disposal stations were approximately $5.5 million in 2003. This does not include the costs of managing the HHW facilities. In addition, Operations spends about $1 million per year on heavy equipment capital purchases. Capital expenditures on station improvements, such as replacing the HVAC system and installing new compactors, vary depending on the size of the project.

***Table 3-8.** Recycling and Disposal Station Rehabilitation Projects since 1998*

Improvement	Year Completed
Replacement of the underground storage tank at the SRDS, as required by regulations	1998
Correction of surface water and sanitary drainage deficiencies at the NRDS and SRDS	2000
Replacement of the HHW facility canopy cover at the SRDS to meet regulatory requirements	2000
Installation of truck scales at the NRDS and SRDS to enhance efficiency	2001
Electrical repairs, including upgrades to the heating, ventilation, and cooling system at the station scale houses, and addition of auxiliary power at the NRDS and SRDS	2003
Replacement of compactors at the NRDS and SRDS	2004

Long-Range Planning

The 1998 plan proposed development of a comprehensive reuse/recycling center at the South Station, and possible acquisition of additional property near the North Recycling and Disposal Station for expanded recycling. In 2000, expert review of this proposal, and site visits to more modern facilities in California and Washington State suggested that the proposal would not achieve SPU's recycling and customer service goals, and that additional space at SRDS would be needed.

The inadequacy of current facilities to handle future solid waste needs, combined with the physical deterioration of the stations, was becoming increasingly obvious. In December 2001, the City Council passed a resolution directing SPU to develop a master plan to address long-term facility needs for efficient waste transfer, optimum diversion to reuse and recycling, and convenient services for self-haul customers.

Self-haul customers bringing yard debris to the recycling and disposal station

Needs and Opportunities

Despite the intention to implement a major solid waste capital development project in the near future, there are still opportunities to improve working conditions and operational efficiency at the recycling and disposal stations in the short term.

Seattle citizens have frequent face-to-face contact with City employees at the City's recycling and disposal stations. Thus, the staff at the recycling and disposal stations play an important role in maintaining the City's relationship with customers, as well as representing the City's conservation philosophy.

There are opportunities to make the stations more "customer friendly" by improving signage and offering other information, and there are chances to provide educational opportunities for station staff to help maximize customer service.

Programs and strategies to address these needs and opportunities are discussed in Chapter 4.

Clean City

Clean City is a set of programs that provide tools designed to abate graffiti, illegal dumping, and litter. Clean City was referred to as "Community Partnerships" in the 1998 Plan. The Clean City name emerged later to be more descriptive of the functions provided. Clean City is not the same program as the Mayor's Clean Seattle Initiative. The Clean Seattle Initiative describes interdepartmental cleanup events in neighborhoods.

Clean City is a comprehensive, ongoing set of programs. They are an extension of traditional solid waste services that help keep streets and neighborhoods clean and healthy by collecting garbage, and which encourage environmental awareness. Delivered at the neighborhood level, these programs accomplish the following:

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

Goals and Objectives

The goals in the 1998 Plan related to Clean City include the following:

- Keep Seattle's neighborhoods clean and safe by partnering with communities.
- Increase the efficiency, fairness, convenience, and accessibility of services.

Over the past 5 years, the key objectives for Clean City have been to:

- Improve all public spaces by reducing graffiti, illegal dumping, and litter in the community.
- Promote community environmental stewardship; engage citizens in protecting natural resources.
- Provide residents with the resources necessary to act as community stewards.
- Encourage community involvement in local environmental improvements rather than relying on government.

Programs and Outcomes – 1998-2003

The 1998 Plan described specific strategies to enhance community partnerships, encourage environmental awareness, and involve people in keeping their neighborhoods healthy. **Table 3-9** lists these strategies and the associated programs that help achieve the 1998 Plan goal.

Table 3-9. *1998 Plan Strategies and the Clean City Programs Implementing These Strategies*

Strategy	Clean City Programs	
Continue to provide resources to help people take action locally	■ Outreach (provided in multiple languages) ■ Adopt-a-Street ■ Grant Central Station ■ Business Improvement Area Supplemental Funding	■ Spring Clean ■ Hotline ■ Illegal Dumping Enforcement ■ Public Place Recycling ■ Graffiti Rangers
Expand volunteer involvement to increase the number and quality of direct contacts with SPU programs and create maximum access to available resources.	■ Outreach (provided in multiple languages) ■ Adopt-a-Street	■ Spring Clean
Expand efforts to reach smaller and less organized groups and provide easier access to tools, funds, and assistance.	■ Outreach (provided in multiple languages) ■ Adopt-a-Street ■ Grant Central Station	■ Spring Clean ■ Home Cleanup ■ Senior Assist
Engage youth and children as neighborhood stewards.	■ Partnerships established with YMCA Earth Service Corps and Parks and Recreation summer day camps	■ Spring Clean

The Clean City programs are bundled within four major areas:

- Community cleanup
- Litter pickup
- Graffiti
- Illegal dumping

A short description of each Clean City program is included below.

Community Cleanup

There are five community cleanup programs:

- **Spring Clean** supports projects spearheaded by residents in parks, streets, rights-of-way, open spaces, and other City-owned parcels. Activities include litter pickup, tree planting, storm drain stenciling, graffiti paint-outs, invasive weed removal, and other habitat improvement projects. SPU supports neighborhood efforts by providing trash bags, litter disposal, certificates of appreciation, and help with project design, publicity, and volunteer recruitment. The annual campaign kicks off each March and runs through May.
- **Home Cleanup** aims to reduce illegal dumping by providing coupons to qualifying households (in buildings that contain up to four units) for one annual free-of-charge disposal of up to 500 pounds of garbage or yard debris at the City's transfer stations. Since its inception in the mid 1980s, the program has been reconfigured several times. Beginning in 2004, the program will provide coupons to low-income residents only; limiting the number of eligible participants alleviates transfer station traffic impacts and better aligns the program with SPU's intention to provide financial incentives for recycling, reuse, and waste reduction rather than disposal.
- **Senior Assist** provides senior citizens with a no-cost annual service for disposal of up to 500 pounds of garbage. The service includes material removal and transportation by City crews.
- **The Vector Program** aims to protect individuals and the community from diseases that may be transmitted by vectors (in this case, rodents). Administered by the Seattle-King County Health Department, program staff respond to rodent complaints and disseminate information about vector control.
- **Public Place Recycling** strategically pairs a recycling container with City street-side litter containers in business areas throughout the City. SPU conducted a 6-month pilot in 2000 to explore participation and material diversion levels. Based on successful pilot results, the program will be expanded in 2004.

Litter Pickup

SPU maintains four litter pickup programs:

- **Adopt-a-Street** provides residents, businesses, community groups, and social organizations with the tools needed to reduce the impacts of litter in the community. Groups or individuals agree to adopt 1 mile or more of City streets and keep them clean for a minimum of 2 years. The City provides organizational help, cleanup supplies, free hauling, and street signs that announce the Adopt-a-Street sponsors.[8]
- Mayor Nickels instituted the **Clean Seattle Initiative** in 2002 in order to improve the quality of life in Seattle. A partnership between business, civic organizations, citizen volunteers, and several City departments, the program promotes urban stewardship and creates a clean and secure community. The effort supports litter pickup, street cleaning, streetlight repairs, graffiti paint-outs, and weeding. Participating departments include Seattle Department of Transportation, Seattle City Light, Seattle Parks and Recreation, Seattle Department of Neighborhoods, Department of Planning and Development, Office of Arts and Cultural Affairs, Seattle Police Department, and SPU.[9]

Local residents participate in a "Clean Seattle" event.

- **Street-Side Litter** provides collection and disposal of garbage deposited in containers located along City streets and sidewalks in business areas. More than 800 containers have been located throughout the City to collect litter generated by pedestrians.
- **Litter Collection in Parks** provides collection and disposal of garbage placed in more than 2,500 containers located in parks throughout the City. In addition, the program provides litter pickup in parks located in the downtown retail core and downtown neighborhoods.

Graffiti

There are four main graffiti removal and prevention programs:

- **Grant Central Station** provides grants to community groups, schools, and individuals to purchase supplies for projects that rehabilitate public property and benefit the environment and community. Funds are also used for educational materials and outreach to prevent graffiti. For example, the South Park Crime Prevention Council received a grant to organize a community graffiti cleanup effort and provide refreshments to volunteer work parties. The community effort has cut the number of graffiti incidents and brought the neighbors together to create a safer environment.[10]

8 See SPU's Adopt-a-Street home page at http://www.seattle.gov/util/Services/Garbage/Reduce_Garbage_&_Litter/Adopt-A-Street/index.asp

9 For additional information about the Mayor's Clean Seattle Initiative, see http://www.seattle.gov/mayor/issues/cleanseattle.htm

10 For further discussion of the grant program and description of community projects funded by Grant Central Station, see http://www.seattle.gov/util/Services/Drainage_&_Sewer/Get_Involved/Environmental_Grants/index.asp

Graffiti Rangers at work.

- **Graffiti Rangers** remove graffiti from SPU and other City property that has been reported to the Graffiti Hotline. Because the most effective approach to curbing graffiti is rapid removal, the Rangers strive to remove graffiti (also called "tags") from SPU property within 10 days. Crews use chemicals to remove tags or cover graffiti with paint recycled from the City's HHW collection facilities.[11]
- **Graffiti Prevention** informs area businesses, community groups, and property owners of the City's 1996 Anti-Graffiti Ordinance, which defines graffiti tagging as an act of property vandalism and prescribes fines for property owners who do not remove graffiti in a timely manner.[12] SPU's graffiti prevention program also supports private property interests by providing graffiti cleanup volunteers with free paint from the City's HHW collection facilities.
- **Business Improvement Association (BIA) Supplemental Funds** provides funds to existing BIA cleaning contracts to support additional litter pickup and graffiti removal within BIA areas.

Illegal Dumping

There are two main illegal dumping programs:

- **Illegal Dumping Enforcement and Litter Accumulation** staff respond to and clean up litter and illegal dumping on public property. Examples include cleaning up furniture and construction materials dumped on roadsides, cleaning up homeless encampments under bridges, and removing abandoned vehicles from streets or alleys. Illegally dumped waste may expose humans to health dangers and the environment to ecological decay. This program also investigates reports of accumulating garbage and illegal dumping on private property. This sends a message to violators that dumped or accumulating garbage will not be tolerated in neighborhoods.[13]
- The **Hotline** receives calls from citizens reporting graffiti and illegal dumping violations. Hotline staff notify appropriate departments and agencies for resolution, including Metro Transit, Seattle Department of Transportation, Seattle Department of Parks and Recreation, and SPU investigation/enforcement staff. Citizens may also report graffiti on the Hotline.

11 To report graffiti and learn ways to discourage graffiti, see the graffiti home page at **http://www.seattle.gov/util/Services/Garbage/Reduce_Garbage_&_Litter/Graffiti_Prevention_&_Removal/index.asp**

12 To view the ordinance, go to **http://clerk.ci.seattle.wa.us/~public/cbor1.htm** and search for ordinance number 118082.

13 For additional information on SPU's illegal dumping programs and to report incidents of illegal dumping, see the illegal dumping home page at **http://www.seattle.gov/util/Services/Garbage/Reduce_Garbage_&_Litter/COS_002176.asp**

Table 3-10 summarizes the key outcomes of each of the Clean City programs listed above since the 1998 Plan.

Table 3-10. Summary of Clean City Program Outcomes in 2003

Project	Key Outcomes
Community Cleanup	
Spring Clean	■ 111 tons of litter and garbage removed from public spaces
Home Cleanup	■ Data not available—program performance not yet known because the program was reconfigured in 2003
Senior Assist	■ Assisted approximately 1,474 seniors ■ Disposed of 300.28 tons of garbage
Vector Program	■ 649 sites visited in response to complaints
Public Place Recycling	■ Program temporarily suspended in 2003 due to budget constraints
Litter Pickup	
Adopt-a-Street	■ 189 active groups; 109 groups participating as full 1-mile adopters ■ 49 new adopters ■ Adopters in all City sectors ■ 7,000 volunteer hours
Clean Seattle Initiative	■ Conducted 11 community cleanup events
Street-Side Litter	■ Completed review and updated GIS database of all City-maintained litter cans
Litter Collection in Parks	■ Data not available
Graffiti	
Grant Central Station	■ Awarded one grant in support of 2-day community paint-out
Graffiti Rangers	■ Removed 21,626 graffiti tags from City-owned property ■ Distributed 1,324 gallons of free paint for graffiti paint-outs on public and private property
Graffiti Prevention	■ Responded to 1,521 private property reports from the Hotline
Business Improvement Association (BIA) Supplemental Funds	■ Allocated $45,000 to 6 Seattle BIAs to supplement existing cleanup services ■ All BIAs incorporated litter and graffiti cleanup and outreach into their programs via newsletters, person to person, and web pages
Illegal Dumping	
Illegal Dumping Enforcement and Litter Accumulation	■ Investigated and resolved over 2,625 cases ■ Picked up 2,448,000 pounds of illegally dumped materials on City streets—of this total, 248,141 pounds were recycled ■ Mailed 290 notice-of-violation letters to violators and property owners
Hotline	■ 9,411 reports were dispatched to over 25 departments and agencies ■ 95% of reports were responded to within one working day

Table 3-11. Costs of Clean City Programs in 2003

Program Area	Expenditures[14]
Community Cleanup	$ 518,700
Litter Pickup	$ 1,451,800
Graffiti	$ 498,800
Illegal Dumping	$ 583,700
Total	**$ 3,053,000**

Table 3-11 lists the costs of the four Clean City programs at the 2003 level of operation and involvement.

14 Expenditures listed are to SPU Community Service Division's Environmental Partnerships Team only. Other costs to the Solid Waste Fund, such as costs of disposal for street-side litter, are in addition to costs shown.

Needs and Opportunities

Clean City programs have the following key needs and opportunities:

- Equipment maintenance and/or replacement
- Better education for staff about how to recognize and handle potentially hazardous materials
- Database development to increase the efficiency of incident tracking
- Comprehensive benchmarking and program evaluation
- Explore opportunities for greater inter- and intradepartmental coordination
- Expanded opportunities for public place recycling

Programs and strategies to address these needs and opportunities are discussed in Chapter 4.

Historic Landfills

Up until the 1960s, Seattle's solid waste was disposed in various landfill sites within the City limits. Between 1966 and 1986, the City of Seattle operated two major landfills south of Seattle: Midway and Kent Highlands. Midway accepted garbage until October 1983, and Kent Highlands through 1986.

During the 1980s, the U.S. Environmental Protection Agency added the Midway and Kent Highlands landfill sites to the Superfund list. Cleanup efforts undertaken through agreements with the State Department of Ecology were completed at Midway in 1991 and at Kent Highlands in 1995. Cleanup costs for these two landfills were over $110 million.

In 1984 the Health Department conducted an assessment of 12 old landfills in Seattle. The objective of the study was to determine if any public health problems existed at the sites. The assessment included sampling for methane gas; nonspecific organic and nonorganic trace gases; and 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 and recommended specific actions for the remaining sites (Interbay, Genessee, Montlake, Haller Lake, West Seattle, South Park, and Sixth Avenue South). The historic landfills are shown on **Figure 3-13**.

Goals and Objectives

There were no specific goals identified for historic landfills in the 1998 Plan.

Over the past 5 years, the key objectives for historic landfills have been to:

- Continue to monitor and maintain Kent Highlands and Midway in accordance with regulatory requirements and to the satisfaction of local communities.
- Respond to problems at old in-city landfills on a case-by-case basis if they occur.

Figure 3-13. Seattle's Historic Landfills

Programs and Outcomes – 1998-2003

Since Kent Highlands and Midway were formally closed, SPU is responsible for maintaining the sites and performing ongoing monitoring for methane gas emissions at the site boundary, surface water quality of landfill runoff, and surrounding groundwater quality. Ecology performs periodic reviews of monitoring data.

Between 1998 and 2003, the average annual cost of ongoing maintenance and monitoring was $400,000 at Midway and $525,000 at Kent Highlands.

Table 3-12 summarizes actions since 1984 at the old in-city landfills. SPU's approach to the old in-city landfills has been to respond to issues and/or incidents as they arise. As needed, SPU provides advice and assistance to current landfill owners.

Table 3-12. *Actions at Old In-City Landfills from 1984 to 2003*

Landfill	Owner	1984 Recommendations	Actions Through 2003
Arboretum	Parks	■ No further study warranted	
Genessee	Parks	■ No further building construction on school district property[15] until site stabilized and capped ■ No public access to school district property until capped ■ Investigation of feasibility of leachate collection system to control runoff onto 46th Avenue South ■ Soil and surface groundwater sampling and analysis for priority organics and inorganics ■ 1986 Health Dept. toxicity assessment study concluded: — No surface site-use restrictions necessary — School district property should be recapped	■ Methane measurements taken around site perimeter in 1993—very low levels detected in a few sites, mostly at South Oregon and 42nd Avenue South ■ Seventeen residences next to landfill tested for methane at request of owners—very low levels detected at one house on 42nd Avenue South and South Oregon ■ 1997 cover added, leachate collection and gas vents installed on the former school district parcel ■ Parks currently planning a targeted gas control project at 42nd and Oregon
Green Lake	Parks	■ No further study warranted	
Haller Lake	SPU and private	■ Periodic methane monitoring to ensure no gas buildup under trailers	■ 1980s—gas vent pipes installed beneath mobile home onsite by trailer park residents ■ Current status of monitoring activity unknown by SPU
Interbay	Parks	■ No further building construction until site stabilized ■ Soil and surface groundwater sampling and analysis for priority organics and inorganics ■ Banks on north, west, and south of property should be redesigned to prevent future groundwater seepage	■ Site capped with fill and converted to golf course in early 1990s ■ Gas extraction system installed on west side of site—monitored and maintained by SPU—reimbursed by Parks
Judkins	Parks	■ No further study warranted	■ School district did landfill gas investigation—very low levels detected at south end of site ■ Gas monitoring during construction of baseball field—methane detected onsite
Montlake	UW	■ No further building construction until site stabilized ■ Allow shorelines to settle and revegetate naturally ■ Soil and surface groundwater sampling and analysis for priority organics and inorganics—including Lake Washington sediments	■ 1999 Ecology site assessment categorized site as not needing immediate remediation ■ The City paid a settlement to the University of Washington for completion of site closure, and subsequently the UW took responsibility for site remediation ■ Landfill gas remediation project has been implemented
Rainier	Parks and private	■ No further study warranted	
Sick's Stadium	Private	■ No further study warranted	
Sixth Avenue South	Multiple private and public	■ Inexact age and uncertainty of location prevented meaningful investigation ■ Field survey if research pinpoints particulars above	
South Park	SPU and King County	■ Groundwater and stream sampled for priority organics and inorganics ■ Additional methane and nonspecific organic/inorganic testing to more completely evaluate site ■ 1986 Health Dept. toxicity assessment study concluded: — No surface site-use restrictions necessary — Stream onsite should be run through a culvert — Drainage ditch should be filled in	■ Groundwater and gas monitoring wells installed and monitoring program in place—managed by King County
West Seattle	Port of Seattle	■ Soil sampling for priority organics and inorganics ■ Groundwater and tidal pool samples for priority organics and inorganics, including determination of impacts on Duwamish River	■ Whole area remediated by Port and converted to Terminal 5 ■ Remediation included stabilization, capping, and installation of gas probes

15 A 5-acre tract north of Genesee at 46th Avenue South was formerly owned by the Seattle School District. It now belongs to the Seattle Department of Parks and Recreation.

Needs and Opportunities

Kent Highlands and Midway landfills need to be managed in accordance with Ecology requirements, and upcoming construction activities near these sites, which necessitate modifications to the current systems, must be carried out in a way that ensures the integrity of the landfill closures.

There is also an opportunity to evaluate the status of old in-city landfills.

Programs and strategies to address these needs and opportunities are discussed in Chapter 4.

Chapter **4**

Moving Forward – 2004-2008

To cherish what remains of the Earth and to foster its renewal is our only legitimate hope of survival.

Wendell Berry

This chapter of the 2004 Solid Waste Plan Amendment summarizes how Seattle intends to continue moving toward the vision and goals established in the 1998 Plan. Public involvement in the development of the programs for the future is summarized in Appendix B.

A sustainable waste management system—going Beyond Waste—is a long-term vision. It will take many years to achieve, and there will be many turns along the path to sustainability, as new concepts, new issues, and new technologies arise. In fact, it may be more realistic to say that beyond waste is a process of making decisions and choices today that support the safety and health of this generation as well as generations to come.

SPU's asset management approach, which evaluates the long-term social, environmental, and financial consequences of proposed actions, and seeks to maximize long-term benefits, is intended to make sure these decisions and choices are well-informed.

This chapter describes the actions being taken as the next steps on this long journey. These next steps include expanded waste reduction and recycling activities to be implemented during the next 5 years. They also include longer-term planning efforts that will influence Seattle's future solid waste management.

As new programs are implemented, their performance will be tracked, with the intention of delivering programs that provide the greatest value. New program development will be a dynamic and evolving process that takes place within the context of sustainable waste management goals and the beyond waste vision.

The longer-term planning and policy development efforts described in this Plan Amendment are intended to meet current needs and move toward greater sustainability. Examples of longer-term efforts include an assessment of future recycling collection systems, e-waste management strategies, and facilities planning.

Future Opportunities

The needs and opportunities identified in Chapter 3 guide program development and implementation for the next few years. Three key endeavors have emerged over the past few years that address these needs and opportunities and establish direction for much of the work to be implemented between now and 2008:

- SPU's new asset management approach (see also Chapter 1)
- Development of a Solid Waste Facilities Master Plan
- Sustaining our Commitment: Mayor Nickels' Plan to Reaffirm Seattle's Leadership in Recycling,[1] submitted to the City Council in January 2003

These three projects are summarized briefly below, before future programs in each business area are described.

Asset Management

In accordance with the new asset management paradigm, SPU will focus on determining the service levels that provide optimum value, as well as assessing the effectiveness and efficiency of programs delivering these services. This will include the following:

- Establishing or confirming the value of broad service levels (such as 60 percent recycling), as well as program-specific service levels.
- Measuring program outcomes.
- Evaluating the life-cycle costs and benefits of programs and program areas.

Solid Waste Facilities Master Plan

In December 2003 a draft Solid Waste Facilities Master Plan[2] was submitted to the City Council as directed by Resolution 30341. The resolution reiterated the City's intention to support an integrated solid waste system that would meet current and future City and regional needs, and recognized that replacement and/or rehabilitation of the City's current facilities were critical to provide cost-effective and environmentally beneficial solid waste management services.

In April 2004 the City Council authorized SPU to begin implementation of the Facilities Master Plan.

1 "Sustaining our Commitment" is included in Appendix C.

2 The Solid Waste Facilities Master Plan is available at http://www.seattle.gov/util/About_SPU/Garbage_System/Plans/Solid_Waste_Facilities_Plan/index.asp

Sustaining Our Commitment to Diverting 60 Percent of Seattle's Waste from the Landfill

The package of programs brought forward in 2003 for moving from 40 percent to 60 percent recycling are shown below in **Table 4-1**. For the first time, the 60 percent goal explicitly includes waste prevention. The programs in this package were selected after evaluating a number of alternatives. Four key criteria were used in the selection:

- The extent to which programs were able to achieve projected outcomes
- The extent to which programs address sectors and materials with the greatest opportunity for additional diversion
- Customer convenience and ease of use
- Customer interest and acceptance

Table 4-1. Program Proposals for Reaching 60 Percent Diversion by 2010

Sector	Program	New Tons Recycled[3]	Percent Added to Recycling[4]
Commercial	Expanded curbside recycling to all businesses	4,900	0.6 %
	Paper disposal ban	33,100	4.1 %
	Food scraps collection	31,800	3.9 %
	Commercial yard debris disposal ban	3,800	0.5 %
	Public place recycling citywide—300 high-use pedestrian sites	80	0.01%
	Waste reduction and reuse	8,250	1 %
Residential	Curbside materials disposal ban	36,300	4.3 %
	Back-yard food scraps composting	1,500	0.3 %
	Waste reduction and reuse	8,250	1 %
Self-haul	Reuse/recycling center	39,000	4.7 %
Total		**167,000**	**20.4 %**

Figure 4-1. Sustaining our Commitment—Projected Waste Diversion in 2010

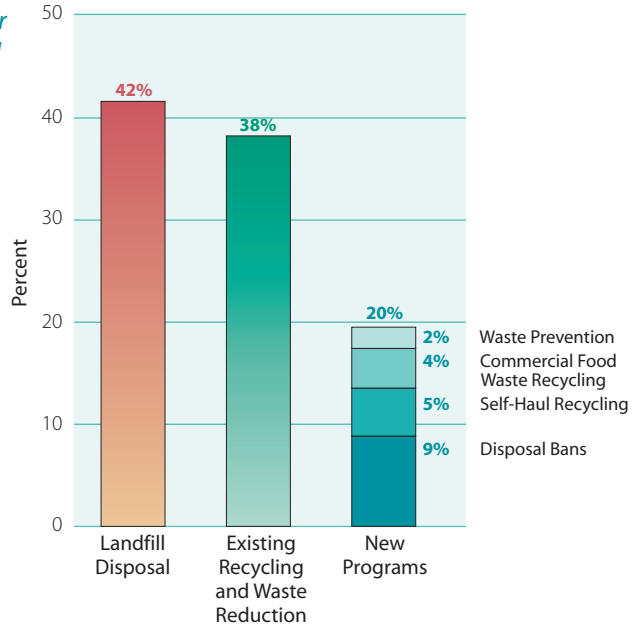


Figure 4-1 shows the impacts of the new programs in the context of the overall municipal solid waste stream. Program specifics are addressed in the business area sections that follow.

3 When program fully ramped up.

4 Percentage of total waste generation.

Costs and Benefits of Sustaining our Commitment

Traditionally, SPU has calculated net cost by determining program capital and operating costs over 20 years and subtracting the "avoided costs" of diverting a ton of material from garbage to recycling or yard debris collection, or of not producing garbage or recycling at all (prevention). These avoided costs include the portion of collection, transfer, and truck transport costs that go away when a ton shifts from garbage to recycling (variable costs), plus all of the rail haul and disposal costs.

In an attempt to address "triple bottom line" costs and benefits according to the asset management approach, SPU has also made a preliminary calculation of the dollar value of environmental benefits of new waste prevention and recycling programs. Environmental benefits include the following:

- Global warming reduction calculated on the basis of reduction in greenhouse gas emissions from landfilling organic materials and from reduced burning of fossil fuels due to energy savings from using recycled instead of virgin raw materials in manufacturing
- Reductions in releases of acidifying compounds due in part to reduced burning of fossil fuels from using recycled instead of virgin raw materials in manufacturing
- Reductions in releases of nutrifying compounds due in part to reduced burning of fossil fuels from using recycled instead of virgin raw materials in manufacturing
- Reductions in DALY losses due to manufacturing products with recycled rather than virgin materials (DALY means Disability-Adjusted Life Year and measures health impacts of the air pollutants, such as nitrogen oxides, sulfur oxides, and particulates)
- Reductions in human toxicity potential due to reduced releases of compounds toxic to humans that result from decreased reliance on virgin raw materials in manufacturing products

There are also additional benefits to ecosystems supporting wildlife and humans in the form of reduced impacts on ecosystem services, such as cleaning air and water and cycling nutrients.

Table 4-2 summarizes the net present value (NPV) of the programs listed in Table 4-1 (excluding the self-haul programs, which are assessed in the Facilities Master Plan). Column 2 shows the "traditional" NPV based only on capital and operating costs and avoided costs. Column 4 shows the NPV when environmental benefits (not including ecosystem effects) are included.

Appendix D contains a more detailed discussion of how these environmental benefits were calculated.

Table 4-2. NPV of "Sustaining our Commitment" Programs for Reaching 60 Percent Diversion

Program	Traditional NPV	Value of Additional Environmental Benefits	Total NPV
Expanded curbside recycling to all businesses	($2,265,917)	$5,669,331	$3,403,415
Commercial paper disposal ban	$10,862,682	$45,862,547	$56,545,229
Commercial food scraps collection	($38,591,765)	Not Available	—
Commercial yard debris ban	$597,658	Not Available	—
Public-place recycling	($2,746,260)	$5,669,331	$2,923,071
Residential curbside recyclables ban disposal	$5,687,015	$49,358,122	$55,045,137
Back-yard food scraps composting	($324,216)	Not Available	—
Waste reduction	$6,262,276	$14,210,208	$20,472,484

Note: All programs have been evaluated at 5 percent discount rate over 20 years.

Waste Prevention

In the ongoing movement towards Zero Waste, waste prevention is increasingly important, especially as defined in this Plan Amendment. Waste prevention includes such things as green purchasing, sustainable building, and product stewardship, as well as the more traditional waste reduction and reuse efforts. This Plan Amendment confirms the City's intention to interpret waste prevention broadly, to expand current efforts, and to measure outcomes more definitively.

Goals

- Increase waste prevention and resource conservation.
- Increase consumer and producer responsibility.
- Reduce toxic products in the waste stream.
- Implement the Sustainable Building Action Plan.

Objectives

- Expand the City's waste prevention activities to incorporate the waste prevention targets established in "Sustaining our Commitment" (see Table 4-1).
- Focus on high volume materials, such as paper and organics, as well as high toxicity materials such as mercury.
- Develop programs that seek to influence organizational rather than just individual behavior.
- Continue to incorporate waste prevention into multi-dimensional conservation programs.
- Establish a method to measure non-SPU-sponsored commercial waste prevention activities and give credit to businesses for waste prevention efforts.[5]

5 In accordance with City Council Resolution 30646, December 2003.

Programs for the Future

SPU will continue to implement waste prevention activities in the six program areas described in Chapter 3—onsite organics, reuse, product stewardship, sustainable building, green purchasing, and waste prevention.

In addition to improving and refining ongoing programs, SPU will increase waste prevention efforts in accordance with the diversion expectations of "Sustaining our Commitment." **Table 4-3** shows how tonnage diversion from new waste prevention programs is projected to ramp up in order to meet the 2010 goal. A brief discussion of the new programs follows.

Table 4-3. Waste Prevention Program Tonnage Diversion Targets for 2004 to 2010

Program	2004	2005	2006	2007	2008	2009	2010
Back-yard food scraps composting	270	510	720	900	1,050	1,260	470
Commercial and residential waste reduction	4,010	4,030	8,101	8,141	12,273	16,446	6,528
Total	**4,280**	**4,540**	**8,821**	**9,041**	**13,323**	**17,706**	**17,998**

Back-yard Food Scraps

Back-yard food scraps composting was selected as one of the 60 percent recycling programs because of the large amount of food scraps in residential garbage and because of customer interest in such a program. In a 2000 survey, 25,000 noncomposting households said they would be "extremely" or "very likely" to compost food scraps and 20,000 noncomposting households said they would be willing to pay $20 per bin.

In 2004 nearly 3,700 bins were distributed to approximately 2,300 Seattle households for $20 per bin (most households choose to have two bins). The program objective is to distribute 2,500 bins each year over the next 8 years.

The renewed back-yard food scraps composting effort is an addition to the existing onsite organics programs described in Chapter 3.

Commercial and Residential Waste Reduction

The other waste prevention programs identified in the 60 percent recycling package are specified only as "commercial waste reduction and reuse" and "residential waste reduction and reuse" (see Tables 4-1 and 4-3). Specific programs to achieve these targets will evolve over time.

For 2004, SPU staff selected a package of new programs from a list of program proposals on the basis of the following criteria:

- Target priority materials (e.g., food scraps, paper, PBTs[6])
- Produce institutional change
- Embody principles of stewardship

6 PBT pollutants are chemicals that are toxic, persist in the environment, and bioaccumulate in food chains and, thus, pose risks to human health and ecosystems. The biggest concerns about PBTs are that they transfer rather easily in the air, water, and land, and they span boundaries of programs, geography, and generations. See http://www.epa.gov/opptintr/pbt/

- Integrate with multi-disciplinary conservation and sustainability projects
- Are feasible in terms of costs, available technology, and staff
- Reflect other City priorities

The programs chosen for 2004 are listed in **Table 4-4**. The outcomes of these programs are being tracked, and refinements and reallocations will be made in future years to meet evolving priorities and achieve the greatest value.

Table 4-4. Summary of New or Expanded Waste Prevention Programs for 2004

Program	Sectors Served
Large-generator waste audits and business-to-business packaging reduction	Businesses
Expanded reuse events	Residents Self-haulers
Investigation of potential development of a permanent reuse facility	Residents Self-haulers
Green remodeling (demolition contractor training)	Businesses Residents Self-haulers
Outreach and information for self-haulers on reuse and waste prevention opportunities	Self-haulers
Paper waste prevention program	Internal City

The new programs represent the use of additional resources made available in 2004 in order to meet the 60 percent recycling program goals. Ongoing waste prevention efforts will continue as described in Chapter 3, and will be refined based on program evaluation and needs assessments. Existing programs include:

- Sustainable building targeting city construction, commercial and multi-family construction, and residential construction
- Product stewardship approaches for mercury-containing products and electronics
- Joint projects with NWPSC partners, such as evaluating product stewardship strategies and distributing educational materials
- Continued participation in green purchasing commodities teams for sustainable purchasing by the City
- Continuation of the Natural Lawn and Garden Care program

In the future, these programs will evolve to include new products and materials or to target new audiences.

SPU's waste prevention programs will include messages to citizens about the value of conservation, a program element that has been particularly emphasized by the City's Solid Waste Advisory Committee.

SPU is implementing methods for tracking performance of its waste prevention programs in order to allocate resources to greatest effect and to determine the best program delivery strategies.

SPU will also strive to measure other waste prevention activities being undertaken by businesses. This will be an opportunity to acknowledge and recognize businesses for their waste prevention activities. Successful programs will provide models of effective waste prevention programs that other businesses can use.

Collection, Processing, and Disposal

Residential garbage and yard debris ready for street-side pickup.

Seattle's basic solid waste yard debris, recycling, and garbage collection services will remain in place through the term of the current collection and processing contracts, which end in 2007, with options to renew through 2009.

SPU will continue to modify and add to these basic services to increase customer convenience, system efficiency, and diversion from landfilling.

The current landfill contract runs through 2028, with the first City opt-out option in 2009.

Goals

- Recycle 60 percent of all waste generated in Seattle.
- Increase the efficiency, fairness, convenience, and accessibility of services.
- Expand local markets and increase purchases or recycled-content products.

Objectives

- Manage current contracts to provide service efficiency and high quality customer service.
- Implement new recycling programs to meet the 60 percent recycling goal.
- Target recyclable materials that are being landfilled in large quantities.
- Evaluate current policies and service delivery strategies.

Programs for the Future

Convenient and Efficient Collection Services

A number of potential modifications to the collection contracts to increase system efficiencies and provide better customer service are in process.

- Partially integrating commercial and residential services to create more efficient collection routes.
- Providing yard debris containers to single-family residents.
- Increasing yard debris pickups to every other week year-round.

These and other service improvement opportunities that may arise during the next 5 years will be evaluated based on costs and benefits of implementation.

Increasing Recycling

"Sustaining our Commitment" includes five programs designed to increase recycling collection. They address the highest-quantity recyclables that are being landfilled, including food scraps and compostable paper, and recyclable paper and cardboard (see Figures 3-8 and 3-9). The five programs are:

1. Commercial paper and cardboard disposal ban
2. Commercial food scraps collection service
3. Curbside recycling service expanded to all businesses (up to two 90-gallon carts every other week)
4. Commercial yard debris disposal ban
5. Residential disposal ban on paper, cardboard, bottles, and cans (that is, current recyclables)

Clean Green ***is yard debris self-hauled to transfer stations. Clean Green disposal rates are lower than those for garbage.***

These programs are projected to divert an additional 13.4 percent of municipal solid waste generated (see Table 4-1 above) and to result in net cost savings after the first 2 years.[7]

Disposal Bans

Disposal bans target currently recyclable materials that are being disposed in landfills by both residents and businesses. The disposal bans are projected to divert over 70,000 new tons per year by 2010. In December 2003 the Seattle City Council unanimously approved Ordinance 121372, which prohibits businesses from disposing recyclable paper, cardboard, and yard debris in the garbage, and prohibits residents from disposing recyclable paper, cardboard, cans, and bottles in the garbage as of January 1, 2005.

This program does not assume that 100 percent of the available materials will be recycled. **Table 4-5** shows how much recyclable material is assumed to be diverted from the landfill as a result of the ban.

Table 4-5. *Disposal Ban Diversion Assumptions*

Material	Commercial	Residential
Newspaper	90%	95%
Cardboard	90%	80%
Mixed paper	90%	90%
Yard debris	90%	Already Diverted[8]
Beverage and container glass	Not Banned	77%
Tin cans	Not Banned	55%
Aluminum cans	Not Banned	74%
Plastic bottles	Not Banned	80%

7 For more information, see Appendix C of this Plan Amendment.

8 Yard debris was banned from residential disposal in 1988. Currently about 35 percent of residential yard debris is diverted to back-yard composting. Ninety percent of the rest is diverted to curbside collection or to self-haul Clean Green.

For the first year of the ban (2005), the focus will be on educating customers rather than enforcement. Garbage containers with significant amounts of prohibited recyclables will be tagged with an informational notice. Actual penalties will be imposed after January 1, 2006. Businesses could be fined as much as $50 for not recycling. Single-family residents will not have their garbage collected until they remove recyclables from garbage cans. Multi-family accounts could receive a surcharge of $50 on their garbage bill. However, the primary intention is to support participation in recycling through education and technical assistance. Penalties will be a last resort.

A major promotional and educational campaign will start in 2004 to inform customers about the new recycling requirements.

Expansion of Curbside Recycling to All Businesses

The City currently offers the residential curbside recycling program to commercial garbage accounts that generate less than 90 gallons of garbage a week. This service includes up to two 90-gallon carts for curbside set out every other week at no additional cost.

This program will be expanded to all of Seattle's commercial garbage accounts, regardless of size. It is not a substitute for existing private recycling services but rather offers a no-cost option for businesses to recycle small quantities of mixed materials. Expanding curbside recycling to all business is projected to divert an additional 5,000 tons per year by 2010.

Commercial Food Scraps Collection

The commercial food scraps collection program targets the large quantity of food and compostable paper from businesses such as grocery stores, restaurants, and institutions that is currently being landfilled. The goal of the program is to provide an economic incentive by collecting commercial food scraps at a cost to customers that is less than garbage collection.

By 2010 this program is projected to divert an additional 32,000 tons of material per year from landfilling to composting. **Table 4-6** shows the diversion assumptions for this program. Diversion rates are a function of the total number of businesses expected to participate and the amount of food they are likely to separate out for food scraps collection. The assumptions are based on information obtained through the 1995 Commercial Food Scraps Collection and Composting Study.

Table 4-6. *Commercial Food Scraps Collection Diversion Assumptions*

Commercial Subsector	Percent Diverted from Landfill
Manufacturing	36%
Wholesale	40%
Eating and drinking (restaurants, hotels, etc.)	40%
Health	20%
Grocery stores	60%
Education	40%

Other Recycling Opportunities

The programs described above address all the materials found in significant amounts in the disposed waste stream except for residential food scraps. A residential food scraps collection program was not included in the Sustaining our Commitment program primarily because of concerns about customer acceptance and the projected high program costs. However, recent improvements in processing technology have made residential food scrap collection more feasible, and local experience by other jurisdictions has shown that some residents appreciate the additional opportunity to recycle.

In the future, SPU will evaluate the option of providing voluntary residential food scraps collection service. It is estimated that such a program would divert an additional 12,000 tons per year from the landfill, increasing the City's overall recycling rate by another 1.5 percent.

Processing and Disposal

The organics-processing contract with Cedar Grove has recently been renegotiated to include food scraps and compostable paper along with yard debris at no additional cost per ton. Cedar Grove has received a permit from the Health Department to accept post-consumer food scraps at the Maple Valley Facility. Cedar Grove has also sited and permitted a new facility on Smith Island near Everett, which will be able to handle up to 82,000 tons of yard debris a year, freeing up capacity at Maple Valley.

The City's contract with Cedar Grove requires that yard debris be processed into a marketable product.

No changes are currently being considered to the long-haul and garbage disposal contract with Waste Management. The City has an option to terminate the contract on March 31, 2009.

Evaluating Collection, Processing, and Disposal

The City's 60 percent recycling goal was established in 1988 as the amount of recycling that could be achieved "cost effectively,"[9] meaning that costs to customers were lower with recycling programs in place compared to collection and disposal of the same materials as garbage. To date, Seattle's recycling program has been very cost effective. In 2001 residential ratepayers saved $50 for every ton that was recycled rather than disposed—a savings of over $3.5 million.

Over the next 5 years, SPU will continue to evaluate the overall performance and life-cycle costs and benefits of recycling programs. The outcome of this analysis will set the stage for a policy review of the 60 percent recycling goal to be incorporated in the 2008 Comprehensive Plan.

Strategies for measuring CDL and developing a recycling goal will also be assessed in order to develop a more complete package of solid waste management programs and to recognize currently unacknowledged recycling performance.

9 Resolution 27871, October 1988, Paragraph I.B.2.b.

Promising new technologies for collection and processing will also be reviewed, along with customer response, as specifications for the next round of collection contracts are developed. Seattle's interest is to support a system that provides maximum life-cycle benefits over the long term, and that supports the long-term health of recycling and the recycling industry, not to mention the health of workers in the recycling industry—both in the U.S. and abroad. This assessment will include an evaluation of the costs and benefits of commingled versus separated recycling collection.

As the 2009 long-haul/disposal contract opt-out date approaches, SPU will also evaluate the costs and benefits of terminating, amending, or continuing this contract with Waste Management. The development of a new Intermodal Facility for garbage transfer (see Solid Waste Facilities Master Plan) would entail changes in the way the City manages garbage transfer and rail-loading and could affect the current contract arrangements with Waste Management.

Garbage being dumped from shipping containers at the Columbia Ridge landfill.

Facilities and Operations

The focus during the next 5 years for Facilities and Operations will be to maintain the safe and efficient performance of the current recycling and disposal stations while a Facilities Master Plan is prepared and decisions about future facility development are made and implemented. New or improved facilities are not expected to be operational until 2008 –2010.

Goals

- Increase the efficiency, fairness, convenience, and accessibility of services.
- Recycle 60 percent of all waste generated.

Objectives

- Ensure safe and reliable facility operation, incorporate operational efficiencies, improve recycling opportunities, and optimize service availability.
- Improve "customer friendliness" of stations.
- Improve working conditions.
- Finalize and implement a Facilities Master Plan.

Programs for the Future

Facility Operations

The Solid Waste Operations Business Plan has identified some specific actions to improve the efficiency, safety, and customer service of its ongoing operations during the next few years:

- Prepare standard operating procedures and best management practices that define optimum services and safety for the public, employees, and the environment.
- Acquire additional equipment capacity to enable more efficient transportation of commodities.
- Revise layout and operation procedures for metal collection, transfer, and transportation.
- Improve procedures to reduce customer waits, such as alternate traffic patterns and providing a separate entrance for HHW customers.

Some operational changes are already under way. Recently, SPU began hauling some containerized waste from the recycling and disposal stations to the Argo Yard at night rather than during the day. With less traffic at night, the drivers are able to transport more containers to the rail yard more quickly.

In order to increase the "user-friendliness" of the stations and support the disposal bans, SPU will develop new signage and other informational materials to help customers find their way to the right containers and to encourage them to keep recyclables out of the pit. Relocation of recycling containers and separate access for recycling will also be considered to help increase recycling and reduce queuing.

During the next 5 years, SPU will implement the following facility modifications to enhance working conditions:

- Misting system at SRDS
- Warming stations for floor staff
- Improvements in the light level in the station

Because Solid Waste Operations staff have daily contact with customers, SPU will offer additional customer service training to enable communication excellence.

Recent changes in Seattle's private transfer station operations may affect the quantity and types of materials that flow to City stations. Furthermore, the current commercial collection contracts allow the City to direct increasing amounts of commercial garbage to the City's recycling and disposal stations. SPU will direct contractor-collected garbage and yard debris to City or private stations to achieve maximum systemwide efficiency.

Facility Maintenance

No major changes to the existing structures are planned while the Facilities Master Plan process is under way. The stations will receive ongoing maintenance, equipment replacement, and other repairs, as needed, to remain safe, operational, and compliant with regulatory requirements. Ongoing activities include:

- Upgrading of service access gates to allow City truck drivers to open and close them remotely without leaving their trucks.
- Replacement of security cameras and recording system at scale-houses.
- Replacement of scale-house computers and software.
- Other repairs and equipment replacement on an as-needed basis (based on past experience and the condition of existing structures, it is anticipated that emergency repairs may be needed to the electrical system, water system, and other structures).

Long-Range Facilities Planning

The draft Solid Waste Facilities Master Plan evaluated the costs and benefits of a number of options for facility development based on the following criteria:

- Increasing worker and customer safety.
- Improving working conditions.
- Optimizing diversion to reuse and recycling.
- Reducing the amount of time that self-haul customers wait in line to use the stations.
- Ensuring future system flexibility.

The draft Solid Waste Facilities Master Plan can be reviewed at **http://www.seattle.gov/util/About_SPU/Garbage_System/Plans/Solid_Waste_Facilities_Plan/index.asp**

The Solid Waste Facilities Master Plan assumes that new facilities will last for 30 years or more. The intention of the Plan is to provide a system that meets current needs for handling waste materials, offers services that help Seattle achieve its 60 percent recycling goal, is convenient and accessible to both contractor haulers and self-haulers, and that is also flexible enough to adapt to future change.

SPU will proceed with environmental review under the Washington State Environmental Policy Act (SEPA) before proceeding with implementation. The environmental review, along with property assessments, negotiations, and permitting, is scheduled for 2004-2005. **Table 4-7** shows the tentative schedule for implementation of the plan.

Table 4-7. *Solid Waste Facilities Master Plan Implementation Schedule*

Facility	2004	2005	2006	2007	2008	2009	2010
Intermodal	Permitting	Design	Design	Construction	Operation		
SRDS		Permitting	Design	Design	Construction	Operation	
NRDS			Permitting	Design	Design	Construction	Operation

Clean City

This Plan Amendment affirms the City's commitment to abate graffiti, litter, and illegal dumping. The Clean City programs support the City's overall waste management program by creating a cared-for environment that enhances the livability of the City at the neighborhood level and promotes and encourages community stewardship.

Goals

- Keep Seattle's neighborhoods clean and safe by partnering with communities.

Objectives

- Deliver illegal dumping, litter, and graffiti programs so that existing levels of service are met.
- Replace essential infrastructure (streetside litter containers) to ensure safe and reliable program operation.
- Review and develop existing program databases in order to facilitate daily data management and program evaluation.
- Provide additional tools to illegal dumping staff so that cases are resolved safely and efficiently.
- To the extent possible, conduct analyses to incorporate efficiencies, improve opportunities, and optimize service availability.

Recycling containers at Seattle Center.

Programs for the Future

During the next 5 years, SPU intends to maintain essentially the existing service levels with respect to graffiti removal, litter pick up, and response to illegal dumping.

In accordance with asset management goals, Clean City programs will be evaluated to assess strategies for increasing the efficiency and effectiveness of service delivery. Programs may be modified in response to this assessment or to respond to changing needs. Specific topics to be reviewed include the following:

- Street-side litter container locations, to determine the need for a strategic redistribution based on changing capacity needs.
- Distribution of service, to ensure services are delivered equitably to all communities.
- Strategies for ensuring appropriate accountability by public and private property owners (i.e., Who is responsible for what? And what role should SPU play on non-SPU property?).
- Opportunities for SPU's Clean City programs to leverage results by collaborating with other programs within SPU or in other departments.

The 60 percent recycling plan includes a commitment to implement a public place recycling program. During the next 2 years, 300 recycling containers will be located near street-side litter cans in heavy pedestrian-use areas to reinforce the message that Seattle is a recycling city. New event recycling programs are already under way with the intention of visibly reinforcing the recycling message.

While public place and event recycling recover only a small quantity of recyclables (see Table 4-1), its value is in the visibility of recycling to Seattle residents, as well as to visitors.

Historic Landfills

Seattle's historic landfills fall into two groups:

1. Kent Highlands and Midway—former Superfund sites that were closed and are currently managed through legal agreements with Ecology.
2. Old in-city landfills, which are currently owned by different parties, as shown in Table 3-12.

Goals

No specific goals were identified in the 1998 Plan.

Objectives

SPU has the following objectives at the Kent Highlands and Midway landfills:

- Continue maintenance and monitoring in accordance with Ecology agreements.
- Safely manage construction activities by the Washington State Department of Transportation and the City of Kent that may affect these landfills.

For the old in-city landfills, SPU has the following objectives:

- Continue to respond to incidents if they arise.
- Evaluate the potential need for further investigation of these sites.

Programs for the Future

Midway and Kent Highlands Landfills

SPU will continue to maintain these former landfill sites and monitors landfill gas concentrations and groundwater conditions as required by regulatory agreements.

Upcoming activities at the Kent Highlands and Midway landfills are as follows:

- The City completed negotiations and entered into agreement with the City of Kent regarding land transfer to accommodate the construction of 228th Street north of Kent Highlands. This agreement leaves all the existing infrastructure intact, with the exception of a section of the leachate force main, which will be relocated, and some probes and wells that are no longer needed. These surplus probes and wells will be decommissioned as part of this agreement.
- The City is in active negotiations with the Washington State Department of Transportation regarding the upcoming freeway construction at Midway. This construction entails removal of refuse from the right-of-way, decommissioning of gas wells, and the relocation of stormwater facilities.
- Ecology performs regular 5-year reviews of groundwater and surface water conditions at both landfills. SPU is currently discussing the results of recent reviews with Ecology and the need for further activity.

Old In-City Landfills

In the future, SPU will continue to respond to questions or issues associated with the old in-city landfills as they arise. SPU will also perform an assessment of the status of these old landfills to determine if any additional work is needed.

Chapter 5

Financing Solid Waste Services

It is a mistake to think you can solve any major problem with just potatoes.

Douglas Adams

SPU provides a wide range of solid waste services directly or through contracted services. Solid waste services are funded through the Solid Waste Fund, an enterprise fund established in 1961.[1]

Revenue sources to the fund are described below. Ninety percent of revenues come from rates for collection or self-haul services. Rates are set by the Seattle City Council. Expenditures from the fund are also summarized below. Seventy percent of expenditures go directly to support customer service, collection, and disposal services.

Solid Waste Revenue

There are four primary sources of operating revenue, listed below, that fund Seattle's solid waste programs.

- Commercial collection rates charged to business accounts.
- Residential collection rates charged to single- and multi-family 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/or transferring nonrecyclable solid waste.

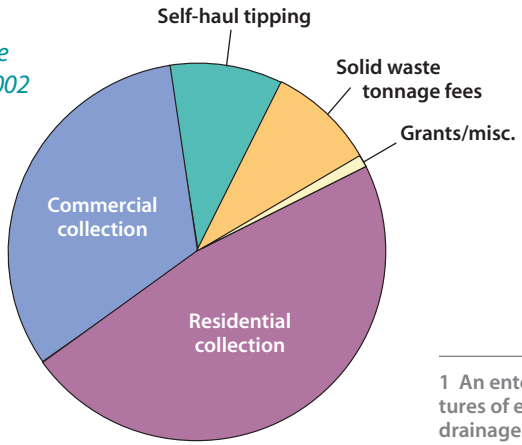


Figure 5-1. Solid Waste Revenue Sources for 2002

Figure 5-1 shows the percentage of revenue from these different sources in 2002. The total operating revenue in 2002 was $112.1 million.

1 An enterprise fund is a proprietary fund. Revenues and expenditures of each of the City's four rate-funded utilities (light, water, drainage and wastewater, and solid waste) flow through an enterprise fund. Each utility is financed and operated as a business-like enterprise, which requires periodic determination of revenues earned, expenses incurred, and net income. For more information see http://www.seattle.gov/pafr/1998/Section1.htm

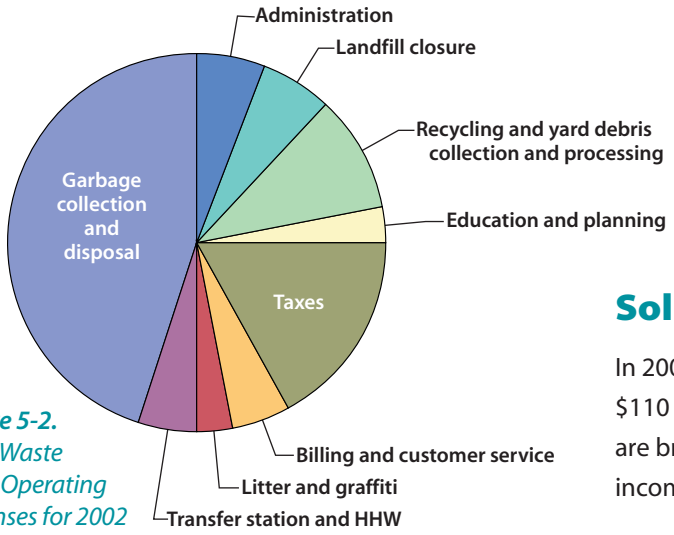


Figure 5-2. Solid Waste Fund Operating Expenses for 2002

Solid Waste Operating Expenses

In 2002, solid waste operating expenses totaled $110 million. **Figure 5-2** shows how operating expenses are broken down. **Table 5-1** shows the Solid Waste Fund income statement.

Table 5-1. Solid Waste Fund Income Statement for 2002

	Activity/Source	$ Millions
Operating Revenue		
	Residential collection	$ 53.4
	Commercial collection	$ 36.7
	Self-haul tipping	$ 11.0
	Solid waste tonnage fees	$ 10.9
	Other	$ 0.1
Total Operating Revenue		**$112.1**
Operating Expenses		
Services provided by private contractors	Residential garbage collection	$ 12.6
	Commercial garbage collection	$ 15.2
	Recycling and yard debris collection and processing	$ 10.3
	Landfill garbage from residents and businesses	$ 20.7
Services provided directly by City staff, consultants, and vendors	General administrative	$ 6.9
	Transfer station operations	$ 3.9
	Yard debris and garbage transport	$ 0.9
	Landfill depreciation/amortization, operation, maintenance	$ 6.4
	HHW facilities and programs	$ 1.4
	Waste reduction and recycling education programs, and solid waste planning	$ 3.7
	Litter and graffiti cleanup	$ 3.5
	Billing and customer service	$ 5.8
Taxes	City and state taxes	$ 18.7
Total Operating Expenses		**$110.0**
Other Income (Expenses)		
	Investment and interest income	$ 0.1
	Interest expense	($ 1.8)
	Amortization of debt expenses	($ 0.1)
Total Other Income		**($ 1.9)**
Operating Grants		**$ 0.4**
Net Income		**$ 0.6**

Solid Waste Collection Rates

Residential

All Seattle residents are required to subscribe to garbage collection service; however, customers may choose the level of service they need. Under SPU's "pay as you throw" rate structure, costs increase as service levels increase. These variable garbage rates, which have been in place since 1981, are designed to encourage waste reduction and recycling. To further encourage recycling, residential customers receive every-other-week recycling service at no additional charge.

Can Customers

Most single-family, duplex, triplex, and fourplex customers ("can customers") have curb or alley service. For an additional fee, can customers can elect to have back-yard collection. **Table 5-2** below shows the rates for can customers. Micro-, mini-, and one-can rates have not increased since 1994. The two- and three-can rates have each increased $0.05 since 1994. Extra garbage (garbage that does not fit into a customer's can) is collected for a $5.50 per unit charge.

Table 5-2. Monthly Residential Can Rates in 2003

Service Level	Curb or Alley Collection	Back-Yard Collection
Micro-can (12 gallon)	$10.05	Not available
Mini-can (20 gallon)	$12.35	Not available
One can (32 gallon)	$16.10	$22.50
Two 32-gallon cans or one 64-gallon cart	$32.20	$45.00
Three 32-gallon cans or one 96-gallon cart	$48.30	$67.50
Additional (per can)	$16.10	$22.50
Yard debris	$ 4.25	Not available
Vacancy rate (unoccupied for 60 days or more)	$ 6.25	Not available
Extra garbage (per bag)	$ 5.50	Not available

Detachable container (dumpster) service is available to apartment buildings with five or more residential units. Rates vary with the number of containers, the frequency of collection and the container size. **Table 5-3** shows a sample of dumpster charges for different container sizes.[2] On average, residential dumpster rates have increased about 18 percent since 1994. Although this is a large increase, it is less than the rate of inflation and has brought the residential dumpster rates more in line with the cost of providing residential dumpster service.

Table 5-3. Monthly Residential Dumpster Rates for Weekly Pickup of Uncompacted Waste in 2003

Number of Containers	Container Size (cubic yards)	Monthly Rate*
1	1	$ 95.71
1	2	$132.22
1	4	$223.24
2	1	$165.32
2	3	$335.36
2	8	$760.46
3	2	$362.46
3	6	$872.58

* Plus $0.60 per dwelling unit.

2 For rate information, see http://www.seattle.gov/util/Services/Garbage/Rates/DUMPSTERR_200312020756325.asp

Other Services

Residential customers may also elect to subscribe to curbside yard debris collection. The rate is a flat monthly fee of $4.25 per month for up to four bags or containers per pickup, plus $1.50 for each additional bag or container.

SPU also provides a special collection service for bulky items, such as furniture and refrigerators. The 2004 special collection rate is $20 per item, with an additional $5 charge for items, such as refrigerators, that contain CFCs.

Low-Income Assistance

The City offers rate assistance to qualified low-income customers. Qualified low-income customers receive a 50 percent discount on their solid waste bill or a fixed credit on their City Light bill (if they do not receive an SPU bill directly). For can customers, the fixed credit is equal to 50 percent of the typical solid waste customer's bill (i.e., 50 percent of the single can rate). For apartment dwellers, the fixed credit is equal to 50 percent of the average dumpster bill per household ($5.85 per month). This approach is consistent with the other City utilities.

Yard debris monthly charges and yard debris extras are discounted 50 percent for qualified low-income customers billed directly by SPU. Low-income customers who are not billed directly by SPU and who are yard debris subscribers receive a credit equal to 50 percent of the yard debris base rate, with no discount on the extra charge. There is no discount on extra garbage charges for qualified low-income customers. Extra garbage is beyond the base service SPU provides and is not considered part of the low-income program.

Commercial

In April 2001, the City entered into contracts with Waste Management and Rabanco for the collection of commercial garbage and began to exercise its authority to set commercial garbage rates. At that time, the City rolled back some commercial rates to their 1994 levels. In 2004, commercial rates are about 1 percent higher than those 1994 levels. Commercial garbage rates are based on the size of the containers and the number of pickups.

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 5-4** shows a sample of commercial garbage rates.[3] Commercial accounts generating 96 gallons or less of garbage per week are currently eligible for the City's residential recycling collection service at no additional charge.

3 For more information about commercial garbage rates, go to **http://www.seattle.gov/util/Services/Garbage/Rates/COMMERCIAL_200312020756314.asp**

Table 5-4. Monthly Commercial Dumpster Rates for Uncompacted Waste in 2003

Container Size	Rate per Pickup	Monthly Container Rental Rate
60 gallon	$ 6.15	$ 1.80
90 gallon	$ 7.25	$ 1.80
1 cubic yard	$16.15	$ 4.80
2 cubic yards	$28.05	$ 9.00
3 cubic yards	$39.30	$11.20
4 cubic yards	$50.70	$12.75
5 cubic yards	$62.20	$17.55
6 cubic yards	$69.35	$19.65
8 cubic yards	$87.90	$22.35

SPU has negotiated with its contractors to provide several new solid waste services for commercial businesses. These new services will help the City achieve its 60 percent recycling goal and include the following two options:

- **Recycling collection.** All commercial garbage accounts can elect to have limited[4] recycling service at no additional cost.
- **Compostable waste collection.** Commercial customers can subscribe to compostable waste (food and yard debris) collection. Rates for this new service are expected to be significantly lower than garbage collection rates to encourage participation.

Table 5-5. Self-Haul Rates in 2003

Type of Waste	Flat Rate Vehicles	Per-Ton Rate Vehicles
Recyclables only	No charge	No charge
Garbage	$14.00 per load	$99.15 per ton ($14.00 minimum for loads up to 280 lbs)
Clean yard debris	$12.00 per load	$572.75 per ton ($12.00 minimum for loads up to 320 lbs)
Clean wood waste	$12.00 per load	$50.90 per ton ($12.00 minimum for loads up to 460 lbs)
Vehicle tires only (limit 4 per load)	$8.25 per load	$8.25 per load
Large appliances only (limit 2 per load)	$16.20 per appliance	$16.20 per appliance
Large appliances and other materials	$5.70 per appliance, plus rates for other materials	$5.70 per appliance, plus tonnage rate for other materials

Self-Haul

Rates at the recycling and disposal stations vary depending on the kind of vehicle and the type of material. To help move customers through the stations efficiently, vehicles that typically have small loads (sedans, station wagons, and SUVs) pay a flat rate on their way into the stations. All other vehicles—including trucks, pickup trucks, vans, minivans, vehicles with trailers, travel-alls, motor homes, modified buses, aid cars, and commercial vehicles—are weighed on their way in and out of the stations and charged based on the weight of their load. **Table 5-5** lists the self-haul rates.

Per-ton vehicle rates have increased by about 6 percent since 1998; flat rates for cars have increased by 70 percent or more. As discussed in the 1998 Plan, this significant increase in car rates reflects the City's intention to reduce the large subsidy that car customers have received in past years.

4 Up to two 90-gallon containers every other week.

Appendix **A**

Solid Waste Program Assessment – November 2001

Executive Summary

A decade ago, Seattle led the nation in initiating successful, cost-effective, full-scale recycling services. Today, Seattle is still a leader for providing comprehensive low costs services, but faces new challenges in upgrading outdated facilities, increasing diversion from garbage disposal, and moving towards waste prevention and product stewardship.

The 1998 Solid Waste Plan, titled *On the Path to Sustainability*, set the current direction and priorities for Seattle's solid waste management. This Assessment reviews SPU' s performance in implementing those priorities and services, and examines key challenges for the next five years and beyond.

Solid Waste Successes and Strengths

During the past three years, SPU has successfully implemented many strategies from the 1998 Solid Waste Plan, resulting in increased waste reduction and recycling, more efficient and cost-effective collection services, and continued customer satisfaction.

- ✔ Strong **overall policy direction** with adopted Solid Waste Plan that emphasizes progressive and sustainable solutions.
- ✔ Support from **committed citizens**, executives and elected officials.
- ✔ **Strong collection contracts** in place beyond 2007. Successful implementation of new residential and commercial contracts, with lower costs, expanded residential services, and performance improvements.
- ✔ Record of **satisfied customers** and strong stakeholder relationships. Popular collection services with residential services ranked in the top three City services.
- ✔ Reliable delivery and cost controls for **municipal transfer, hauling, and landfill closure**.
- ✔ Successful, integrated delivery of **natural lawn and landscape** management, resulting in more on-site management of organics, reduced use of toxic chemicals, and water conservation.
- ✔ Regional leadership in **sustainable building** and **product stewardship**.
- ✔ Efficient **household hazardous waste service** with strong customer education.
- ✔ Considerable progress in **green purchasing** and toxics reduction by City departments.
- ✔ Stable rates and **strong financial performance**.

Solid Waste Challenges and Opportunities

The major challenge is the obsolescence of City transfer facilities. The current system involves redundant material handling with inadequate facilities for recycling. Other strategies from the Solid Waste Plan also demand attention including increased diversion of currently recyclable materials, infrastructure for diverting new recyclables, and non-organics waste reduction.

- ❑ The **recycling and disposal stations** are aging and inadequate for current and future services, requiring near-term maintenance and efficiency improvements and major overhaul of these assets.
- ❑ A third of current garbage could be recycled in **current residential and commercial recycling** services. **Food waste** and compostable paper offer the next major potential wastes for diversion.
- ❑ SPU will need to develop a comprehensive vision for the **next round of collection and disposal contracts (2009)**, test the relevant services and develop appropriate infrastructure.
- ❑ Residential customers have limited financial **incentives to reduce recyclable wastes**.
- ❑ **Producers and distributors** do not incur responsibility for wastes from their products.

- ❑ Need for increased **sustainable building leadership** and assistance.
- ❑ **Historic City landfills** pose potential financial and environmental risks.
- ❑ Customer service agents do not have efficient access to **customer service information**.
- ❑ **City departments** need improvement in waste reduction, recycling, and green purchasing.
- ❑ Expand partnerships for outreach and services, such as **safe disposal or recycling of hazardous wastes**.
- ❑ Clarifying the importance of **clean city services to our core mission**.
- ❑ **Program review and approval** should be more comprehensive and integrated.
- ❑ **Revenues and cash reserves** are not sufficient for increased program and capital spending.
- ❑ Balancing **financial and environmental priorities** will become more challenging for SPU programs.

Emerging Trends

In the twenty-first century conservation will become increasingly critical, and the private sector will be called upon for creative new solutions as responsibility shifts away from local governments.

- ✔ Increasing emphasis on zero waste, prevention, sustainability, and product stewardship.
- ✔ Shift from waste management by local governments to resource management by producers. Shift in costs from ratepayers to consumers.
- ✔ Technological advances facilitate disassembly and recycling of many products.
- ✔ Slowing economy may reduce tonnage and revenues, and affect recycling markets. It may also encourage waste reduction and reuse.
- ✔ Recycling programs could be an important element in the City's global warming solutions.
- ✔ Future population will be aging and more diverse – services will have to meet changing needs.

Solid Waste Vision for the Future

In 2010 there will be 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 and construction debris. Garbage generation is declining, and both residents and businesses recycle aggressively. Builders, manufacturers, and retailers playing a major role in sustainable design and product take back. Organic composts have helped restore Seattle's soils and watersheds, and 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 so that they, and/or their component parts are readily reused or recycled, and with 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.

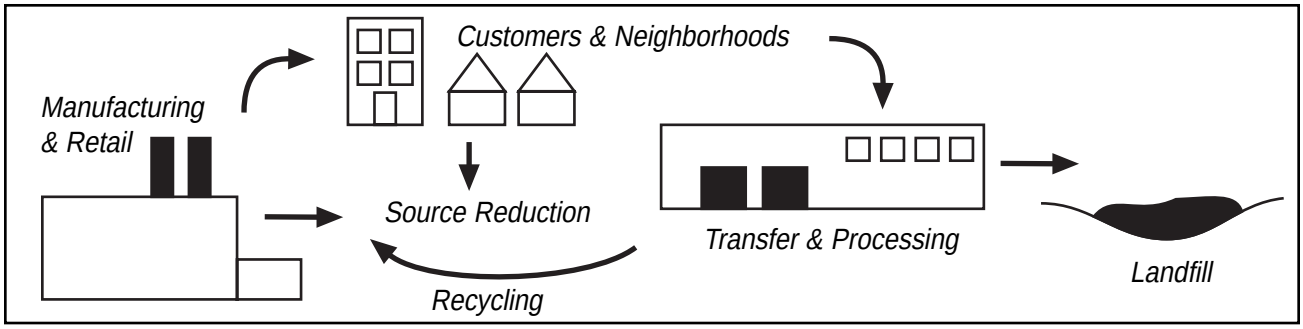
Next Steps - Incorporating the Assessment

This Assessment will provide an overall perspective to help staff and managers prioritize Work Plans for 2002 and establish budget and rate study needs for 2003 and 2004. The Assessment also lays the foundation for the five-year Solid Waste Strategic Plan to be completed in Spring of 2002. The next step will be to establish solid waste goals that reflect this Assessment and then identify strategies and actions.

1. Charter and Policy

Solid Waste Continuum

Residents and businesses consume products and resources. Solid wastes from these products are reused, recycled into new products, or disposed of in a landfill. SPU programs intervene within this continuum to reduce the production of new wastes, increase reuse and recycling of wastes, and manage the safe disposal of remaining wastes.



Seattle Solid Waste Plan

The City of Seattle adopted the current Solid Waste Plan: *On the Path to Sustainability*, in August 1998, after extensive input from customers, citizens, stakeholders, industry experts, and City staff. This 10-year plan established the solid waste vision, values, goals and strategies through 2008.

The **10 year vision** in the Plan emphasized:

- **Integrated collection and handling system**, with state-of-the-art SPU facilities, public and private service providers, and generator sectors. Material collection, handling, and hauling is minimized, creating an efficient and low cost system and helping to keep rates stable.
- **Mature markets** for all recyclable materials, including construction debris and food waste, with established collection and processing infrastructure. Seattle residents and businesses are recycling aggressively.
- **Sustainability and product stewardship** are commonplace, with an increasing number of manufacturers designing products for disassembly and reuse/recycling, and use of the distribution infrastructure for take-back. Businesses routinely incorporate take-back and other green criteria into purchasing specifications. Sustainable building is the standard.
- **Garbage generation is declining**.
- **Organic materials are returned to the soil**, helping to reduce water use and restore urban creek banks and shorelines for salmon. Fewer toxic materials are used in homes and gardens, creating a safer City for humans and other creatures. Unwanted toxic products are carefully disposed.

The Plan balanced priorities within the vision by focusing **on three key values**:

- Protecting public and environmental health.
- Improving cost-effectiveness and system efficiency.
- Responding to customer and community needs.

The Plan incorporated the following **eight goals** to guide programs:

- Increase waste reduction and resource conservation.
- Recycle 60% of all waste generated in Seattle by 2008.
- Increase the efficiency, fairness, convenience, and accessibility of services.

- Expand local recycling markets and increase the purchases of recycled-content products.
- Increase producer and consumer responsibility for sustainable waste management practices.
- Implement the Sustainable Building Action Plan.
- Improve sustainable waste management and resource conservation in all City operations.
- Keep Seattle's neighborhoods clean and safe by partnering with communities.

Program areas and strategies from the Solid Waste Plan are described in *Section 3 Services and Programs.*

SPU Strategic Business Plan

SPU adopted the current four-year Strategic Business Plan in July, 2001. The Business Plan confirmed the department **mission**:

> *We provide our customers with a reliable water supply and 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.*

The SPU Business Plan also established the following **goals** for the 2001- 2004 period:

- Provide reliable infrastructure and high quality, cost-effective utility services for: drinking water, solid waste collection, storm water management, and waste water removal.
- Provide exceptional customer service.
- Create a high–performance workplace to sustain a diverse and inspired workforce.
- Protect, sustain, and enhance environmental quality, both locally and regionally.
- Work with people in the community and neighborhoods to meet their needs and provide public benefits that add value.
- Maintain financial strength and continually improve organizational performance.
- Establish, create, and sustain effective internal and external relationships with key stakeholders, labor and management, large commercial and wholesale customers, business and environmental interests, other City departments, and other government agencies.

The Regulatory Framework

SPU has responsibility for managing Seattle's solid waste (RCW 70.95), including prevention, recycling, collection, transfer, and disposal - under Washington State law. SPU has exclusive authority to provide and set rates for solid waste services (RCW 35.21) by using municipal workers, competitively bidding contracts to private companies, or developing agreements with counties or cities to provide services. Seattle establishes its own solid waste rules in the City's Solid Waste Code (SMC 21.36, 21.40, 21.43 and 21.44).

Several other agencies also have roles in Seattle's waste management:

- **Washington Department of Ecology (DOE)**. Approves waste management plans every five years, establishes solid waste rules (Minimum Functional Standards), and provides technical and grant assistance.
- **Washington Utilities and Transportation Commission (WUTC)**. Regulates rates and services of State-franchised haulers that demolish and haul construction debris.
- **Seattle Department of Design, Construction and Land Use (DCLU)**. Issues land use and building permits to solid waste facilities consistent with local regulations.
- **Seattle/King County Department of Public Health (SKCDPH)**. Enforces solid waste rules, issues operating permits for local solid waste facilities and collection vehicles; monitors historic landfills, screens waste for contamination or special handling needs; and issues clearance forms.
- **Oregon State Department of Environmental Quality (ODEQ)**. Monitors Waste Management, Inc.'s landfill in Arlington, Oregon that accepts all of Seattle's municipal solid waste.

2. Services and Customers

Programs and Services

SPU delivers solid waste services and programs through a combination of internal planning, municipal operations, contract services, and recycling companies operating in a competitive market.

Waste reduction

SPU provides outreach, assistance and discounted products to encourage back yard composting and grasscycling by single-family residents. As a Local Hazardous Waste Management Program partner, SPU helps to educate residents on reducing the use of toxics in homes and gardens. The City's Household Hazardous Waste Collection Sheds divert some items for reuse.

Product Stewardship and Sustainable Building

SPU participates in the Northwest Product Stewardship Council, which educates about product stewardship, and works to increase producer involvement in resource management for priority products and materials. SPU provides technical assistance to increase sustainable building practices for City projects and private construction.

Recycling

In addition to the collection services described below, SPU manages a number of recycling initiatives including technical assistance and outreach to businesses, supporting youth education, assistance to green purchasing by City departments, recycling of household hazardous waste, and long-term planning for new recycling opportunities.

Residential Collection

SPU contractors collect garbage from 142,000 can customers weekly and from 6,300 dumpster accounts, some of which are collected up to six times per week. Single-family curbside recycling is collected every-other-week, while apartment service varies from weekly to monthly depending on the site. Yard waste is collected every-other-week from 85,000 subscribers (and monthly in December - February).

Seattle's Waste Stream (tons)

	1990	2000
Residential garbage	141,000	146,000
Self-haul garbage	81,000	102,000
Commercial garbage	236,000	228,000
Total garbage	458,000	476,000
Residential recycling	47,000	72,000
Self-haul recycling	5,000	7,000
Private recycling	142,000	180,000
Residential yard waste	37,000	34,000
Self-haul yard waste	13,000	14,000
Total recycling	244,000	307,000
Population	516,290	539,538
Employment	469,802	517,470

Recycling rates are included in Section 3

Two companies have exclusive contracts for garbage, recycling, and yard waste collection from 2000 - 2007, with possible extensions to 2009. Waste Management collects all three waste streams from all residential customers north of the Ship Canal. U.S. Disposal (a subsidiary of Allied Waste Systems) provides all collection services south of the canal.

SPU Customer Service Branch provides customer services and bi-monthly advance billing for residential collection services.

Commercial Collection

Two companies have exclusive contracts for garbage collection from 2001 - 2007 with possible extensions to 2009. Waste Management serves all customers South of Royal Brougham Way. Rabanco (a subsidiary of Allied Waste Systems) serves all customers north of Royal Brougham Way. Both companies provide all billing and customer services, although customers call City customer service when problems and disputes arise. SPU sets rates. Collection frequencies vary by customer.

A number of private companies compete for collection and processing of recyclables from businesses. Small businesses can also signup for SPU's residential curbside service. SPU provides information and technical assistance through the Business and Industry Resource Venture (BIRV), a partnership with the Greater Seattle Chamber of Commerce.

Transfer and Self-haul

SPU owns and operates two Recycling and Disposal Stations that offer garbage and recycling drop-off for 350,000 self-haul customers per year, and provide transfer for collected garbage and yard waste. Two privately owned transfer stations accept commercial garbage and separated Construction & Demolition (C&D) debris, and a small amount of commercial self-haul waste.

SPU operates two drop-off sites for household hazardous waste and provides outreach to residents and businesses as a partner in the Local Hazardous Waste Management Program.

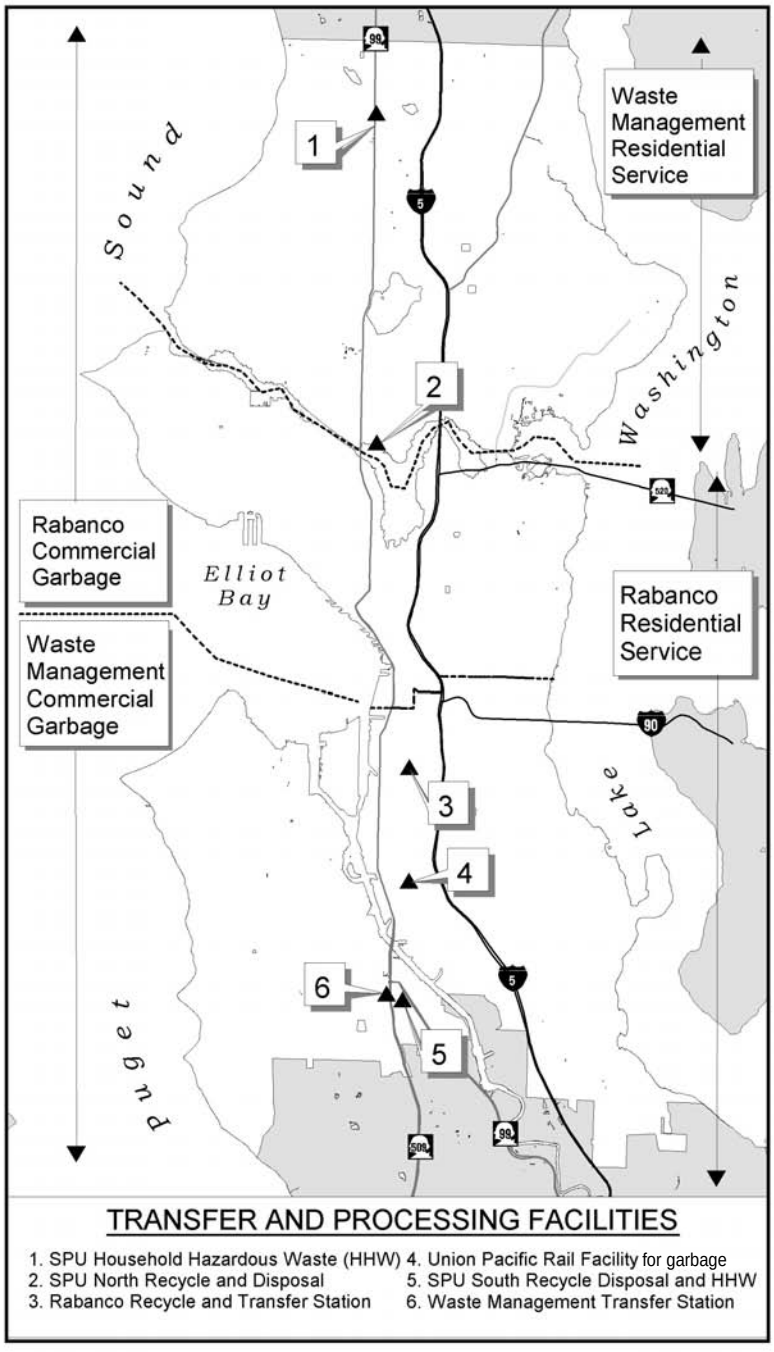
Disposal

SPU has an exclusive contract with Waste Management for disposal of all non-recyclable waste at its Arlington, Oregon landfill. The disposal contract ends in 2026 but SPU can opt out in 2009, 2010, 2011 and 2014. Municipal staff maintain two closed landfills at Kent Highlands and Midway.

Clean Neighborhoods

SPU monitors and removes graffiti, litter, illegal dumping, and litter cans in Seattle neighborhoods. Community and youth programs engage volunteers and students to conserve wastes and keep neighborhoods clean.

Solid Waste Facilities and Service Territories



Solid Waste Customers and Stakeholders

Customers	**Services**
Single family residents (142,000 accounts) Multi family residents (106,000 households) Multi family building owners (6,300 accounts)	• Garbage, recycling, yard waste and bulky item collection; customer service; and billing • Reuse events and Home Cleanup annual coupon for RDS • Master composter and Friends of Recycling volunteer programs Distribution of low cost containers for back yard composting • Information on sustainable lawn and gardening and least toxic products • Curb Waste and Conserve bulletin
Self-haulers (350,000 visits per year)	• Two locations for garbage, yard waste and recycling (curbside materials, clean wood waste, oil, nonferrous metals) drop off • Two Household Hazardous Waste collection sheds (LHWMP)
Businesses (10,000 accounts)	• Variable frequency garbage collection • Every other week recycling collection for small businesses • Technical assistance and information about waste reduction and recycling from the BIRV • Guidance, assistance and incentives for generators of small quantities of hazardous waste (LHWMP)
Neighborhoods	• Adopt a Street clean up program • Anti-Graffiti program • Illegal dumping community partnerships • Community Environmental Grants (Grant Central Station) • Use It Again Seattle events • Public Place Recycling Pilot
Targeted businesses Builders & designers Landscape professionals	• BIRV technical assistance • Information about sustainable lawn care and landscape maintenance • Soil development program • Self-haul yard waste transfer
City Departments	• Sustainable Building policy and Green Building Team support • Technical assistance for Environmentally Responsible Purchasing
Stakeholders	
Contractors – Collectors, Processors, Disposers	• Contract management
SWAC	• Meeting organization and staffing • Member selection
Environmental and Public Interest Community	• Environmental policies • Environmental and conservation programs
Manufacturers, Retailers, Distributors	• Product Stewardship programs
Regulatory Agencies (Ecology, Health, Fire, EPA)	• SW Plan preparation (every 5 years) • LHWMP planning • Minimum Functional Standards compliance (facilities) • Worker Safety compliance

Customer Expectations and Satisfaction

Customers expect reliable and convenient collection service, prompt and courteous customer service, and stable rates. The City's 2001 residential survey shows solid waste services are experienced as highly satisfactory – third only behind fire and emergency medical services. This has been typical for a number of years.

Resident Satisfaction 1-7

	1999	2001
Garbage	5.98	5.99
Recycling	5.81	6.03

Focus groups and surveys performed in 2000 also confirmed increased residential satisfaction with the implementation of the new residential collection contracts. Satisfaction with the new commercial garbage service, which started in 2001, has not yet been evaluated.

In terms of programmatic expectations, surveys and focus groups (involving residents and business representatives) carried out during the preparation of the 1998 Solid Waste Plan showed the following key results:

- 94% supported waste reduction and incentives to promote waste reduction.
- 92% agreed SPU should do more to increase multi-family recycling.
- 84% wanted to recycle more materials, especially plastics (prior to recent changes).
- 70% supported expanding self-haul recycling opportunities.
- 58% would participate in residential food waste collection, although some concerns about pests and odors.
- 94% supported working with producers to reduce packaging and encourage take-back of problem wastes.
- 80% supported increased market development.
- 54% thought banning recyclables from the garbage was a good idea.

Stakeholder Expectations and Satisfaction

The Solid Waste Advisory Committee (SWAC) represents interested residents, service providers, and other stakeholders. Interests and expectations of the SWAC vary with membership and current situations. At this time SWAC is particularly interested in commercial recycling, food waste diversion, waste reduction, product stewardship, and education.

SPU has a good relationship with Department of Ecology in terms of our planning process. SPU is also involved in the development of the Washington State Solid Waste Plan, which so far includes many of the same kinds of goals and objectives as Seattle's Plan.

SPU is in compliance with Minimum Functional Standards at the Recycling and Disposal Stations and HHW Sheds; rules which are enforced by Ecology and the Health Department. Some previous problems at the HHW sheds have been resolved. SPU has had mixed relationships with neighborhoods surrounding the two stations.

Citizen and environmental groups have expressed no dissatisfaction with solid waste services and programs. The emphasis on sustainability, waste reduction, recycling and landfilling reflects the interests of the environmental community strongly expressed in 1988.

3. Successes and Challenges

SPU has continued to advance and improve on a legacy of quality solid waste services and programs delivered to Seattle residents and businesses. This section provides status review of the seven Solid Waste program areas. The review draws from four key resources:

- Status of strategies adopted in the **1998 Solid Waste Plan**.
- Initiatives in the **2001 SPU Strategic Business Plan**.
- **Performance Measures** tracked by the Solid Waste Line of Business.
- Program strengths and weaknesses **from staff focus groups**.

Waste Reduction

Successes / Strengths

The Solid Waste Plan reestablished waste reduction as the top policy priority. Backyard composting and grasscycling have been the most successful efforts:

Households Practicing Waste Reduction		
	1995	**2001**
Grasscycling	28,000	59,000
Yard waste composting	64,000	72,000
Food waste composting	39,000	49,000

- ✔ Backyard composting and grasscyling increased by 40% since 1995, diverting 27,000 tons of yard waste from the landfill per year.
- ✔ Waste generation per capita has not increased over the last decade.
- ✔ Implemented or improved reduction and reuse programs as described in the Solid Waste Plan:
  - ➢ Integrated conservation outreach under Naturals and Soil Building programs;
  - ➢ Variable yard waste rate rewards organics reduction; Discount compost bin and mower distribution continues through regional partnerships.
  - ➢ Introduced reuse website and reuse events for home cleanup.
- ✔ Continued gains in residential toxics reduction with successful outreach from SPU conservation programs and Local Hazardous Waste Management programs.
- ✔ Began implementing green purchasing and reduced toxics used by City departments.

Challenges / Opportunities **[♦ = key challenge for 2001-05]**

There has been limited emphasis on reduction and reuse beyond backyard composting and grasscycling:

Non-organic residential reduction and reuse along with commercial reduction need attention. ♦

The Solid Waste Plan outlines additional opportunities for increasing other areas of waste reduction:

- ➢ Continue to increase and promote **re-use opportunities** and consider reuse space needs[1].
- ➢ Have not focussed on **top commercial waste generators**[1].
- ➢ Examine feasibility of **weight-based garbage rates**, especially for commercial accounts.
- ➢ Increase **residential paper reduction** outreach.

- ❑ Staff identified further challenges to advance waste reduction as the top solid waste priority:
  - ➢ Customers have limited **financial incentives** to reduce recyclables. SPU provides free disposal coupons for the transfer stations and does not have variable recycling rate[2]. ♦

[1] Colleges and universities could have strong potential for increasing re-use and recycling.
[2] Coupons also offer opportunity to expand waste reduction promotion.

- ➢ **Customers are not aware** of re-use and reduction as priority relative to recycling.
- ➢ Opportunities in outreach partnerships to **leverage conservation messages** to residents and businesses, including integration and alternative funding for hazardous waste outreach.
- ➢ Opportunity to promote more **holistic waste reduction** such as 'voluntary simplicity'.
- ➢ Need to ensure that **recycling goals** incorporate waste reduction.

Product Stewardship and Sustainable Building

Success / Strengths

SPU has supported and implemented a number of innovative sustainability initiatives from the Solid Waste Plan and has been a regional leader in sustainable building and product stewardship activities:

- ✔ Co-founded the regional Northwest Product Stewardship Council.
- ✔ Participant in regional dialogue with electronics manufacturers on product stewardship strategies.
- ✔ Supported product stewardship projects for tires and retail apparel stores.
- ✔ Progress on targeted 'take-back' initiatives includes computer and battery recycling.
- ✔ Established an aggressive goal for sustainable building (Silver LEED) in all new City projects greater than 5,000 square feet. Twelve projects in Silver LEED development.
- ✔ Increased technical resources for private sector construction, demolition and land clearing (CDL) recycling and sustainable building practices.

Challenges / Opportunities [♦ = key challenge for 2001-05]

Expanded implementation for these efforts will present new challenges:

- ❑ The City will need to continue to pursue opportunities to shift from wastes managed by rate payers and City services to resources managed by producers and consumers. Further efforts from the Solid Waste Plan include:
  - ➢ Increase responsibility of **producers and distributors**, including regional partnerships. ♦
  - ➢ Raise public and **consumer awareness** and demand for product stewardship practices.

- ❑ Limited progress has been made on **packaging reduction** - a strategy in the Solid Waste Plan

- ❑ Sustainable building is increasing and will require new resources as identified in the Solid Waste Plan and Sustainable Building Action Plan:
  - ➢ Increase **sustainable building** leadership and assistance. ♦
  - ➢ Internal **financial and technical** assistance to meet the City's new requirements.
  - ➢ Incentive barriers for **on-site recycling**.
  - ➢ Staff proposed exploration of sustainable building support from water or drainage funds.

- ❑ Staff identified **CDL recycling** and reuse as an area of limited focus by SPU.

Recycling

Successes / Strengths

Seattle has been a national leader in recycling with a history of effective outreach and services:

- ✔ Recycling programs saved the City more than $12 million over the last decade, with program savings increasing under new residential contracts.
- ✔ Support from committed citizens, executives and elected officials.

- ✔ Improved residential recycling services under new collection contracts (April 2000), incorporating many key strategies from the Solid Waste Plan such as expanded plastics collection, distribution of curbside bins to all can customers, and biweekly collection.
- ✔ Expanded multifamily recycling to 75% of apartment units due to SPU and contractor recruiting, but still below 80% target.
- ✔ Initiated free curbside recycling for small businesses.
- ✔ Continued business outreach and assistance partnership with Chamber of Commerce. Ninety percent of Seattle businesses report that they are now recycling some materials.
- ✔ Tested system and response to public place recycling and residential food waste collection.

Challenges / Opportunities [♦ = key challenge for 2001-05]

SPU will need to increase diversion through current services and new initiatives to meet program goals.

About 40% of materials in the garbage today are recyclable in current markets. Food waste and compostable paper account for another 30% of garbage. Opportunities identified in the Solid Waste Plan include:

- ❑ Get more **currently recyclable materials** out of garbage♦:
  - ➢ **Residential campaign** focussing on recyclables, such as mixed paper and cardboard[3].
  - ➢ **Add new materials** to curbside service as markets allow.
  - ➢ **Increase multifamily participation** incentives and outreach.
  - ➢ Provide more **commercial assistance** and incentives on current recyclables, such as paper, plastic film and wood waste.
  - ➢ Increase **commercial services**, such as promoting and expanding access to curbside service.

Recycling Rates

	2000	2008
Sector	Actual	Target
Single-family	60%	70%
Multifamily	31%	38%
Self haul	18%	40%
Commercial	NA	63%
Overall estimate	42%	60%

- ✔ **Increase food waste composting**. Resolve barriers and improve opportunities for commercial and residential **food waste collection, transfer, and processing**. ♦
- ✔ Boost **internal City practices** for purchasing, toxics and waste reduction, and recycling.[4] ♦
- ✔ Balancing financial and environmental priorities will become more challenging as SPU examines new services that are integral to recycling goals yet more expensive than avoided disposal in the short-term. ♦
- ✔ Implement **mandates or bans** if goals are not being achieved.
- ✔ Increase opportunities for **self-haul recycling and reuse** at south transfer.
- ✔ Expand **public place recycling**.

SPU's Strategic Business Plan highlights three recycling programs listed above as near-term priorities, **commercial recycling, public place recycling, and residential food waste diversion**.

[3] Additional opportunities for improved recycling education include:
- Internal and external presentation and timeliness of web resources.
- Internal and external materials such as employee resources, translations, bill inserts.
- Contamination tracking and response.
- Education on opportunities to recycle other materials - beyond SPU services.
- Transfer stations underutilized for outreach, either through staff reclassification and training or new resources for informing waiting customers.

[4] Opportunities for improving internal practices include SPU leadership and resources, OSE collaboration, management performance contracts, institutionalized systems, and link to green house gas emission reductions.

Collection Services

Success / Strengths

SPU initiated new residential and commercial contracts in the last two years, building on a history of successful collection services:

- ✔ Strong residential and commercial contracts in place through 2007, options for extension through 2009.
- ✔ The new residential contracts implemented all recommendations from the Solid Waste Plan.
- ✔ Residential garbage and recycling services received ratings of 6 on a scale of 1-7 in the 2001 residential survey, maintaining their position as the 3rd and 4th highest rated of 19 city services.
- ✔ The new residential contracts expanded recyclable materials, lowered the service cost to the City and generally reduced the number of collection misses and repeat misses, with some recent challenges in dumpster services.
- ✔ New commercial contracts were implemented with no disruptions and offered a reduced rate for most customers.

Challenges / Opportunities [♦ = key challenge for 2001-05]

The Solid Waste Plan provided guidance for the current contracts. ***Now SPU will need to focus on improving services under the current contracts and preparing for the next round of contracting:***

- ❑ SPU will need to develop comprehensive vision for the **next round of contracts (2009)**, test relevant services and develop appropriate infrastructure.♦
- ❑ Improve monitoring and **reporting of collection services**.
- ❑ Implement potential benefits from partial integration of **residential and commercial services**.
- ❑ Potential increased demand for backyard service with aging population.

Transfer and Disposal

Success / Strengths

SPU continues to perform essential transfer and hauling services, while physical assets are aging and no longer adequate for service needs:

- ✔ Continue to transfer 250,000 tons of garbage per year and 35,000 tons of yard and wood waste while keeping costs down, avoiding disruptions, and meeting all regulatory requirements.
- ✔ Under the new residential contracts, contractor yard waste transfer was reduced at NRDS and slightly increased at SRDS, as recommend in the Solid Waste Plan.
- ✔ Maintain efficient HHW services with strong customer education.
- ✔ Strong long-term disposal contract through 2036.

Challenges / Opportunities [♦ = key challenge for 2001-05]

SPU's two Recycling and Disposal Stations have struggled to keep pace with major system changes with only minor investments of resources:

- ❑ Municipal transfer facilities are **aging and not adequate** for current and future services ♦:
  - ➢ Space not sufficient for current self-haul flow and expanding services. Long wait times for self-haul customers.
  - ➢ No opportunity for comprehensive recycling and reuse services, as described in the Solid Waste Plan.
  - ➢ Traffic and transfer locations and flow are not optimal.
  - ➢ Office facilities are cramped and outdated.
- ❑ Limited **outreach and services for safe disposal** of hazardous wastes. ♦

- ❑ Need to continue **efficiency improvements** to handle more contractor and self-haul visits[5].
- ❑ Transfer **arrangements for residential contractors** have increased peak service challenges.
- ❑ Opportunities for regional **partnerships in long-term disposal** contracts.
- ❑ Staff have had limited involvement in new program development and implementation.

SPU has embarked on a new **Facility Master Plan** to identify the most productive opportunities for upgrading; a priority for programs in the Solid Waste Plan and SPU Strategic Business Plan.

Historic Landfills

Success / Strengths

SPU safely and efficiently monitors the closed Midway and Kent Highlands landfills:

- ✔ Continued maintenance and best practices at landfills with satisfaction of regulatory and local communities.

Challenges / Opportunities [♦ = key challenge for 2001-05]

The City has not developed a comprehensive strategy for the older historic landfills:

- ❑ Need to **assess exposure** from historic City landfills and develop strategic, proactive opportunities to reduce risk, especially for historic landfill property owned by other City departments. ♦
  - ➢ Maximize our current landfill assets.
  - ➢ Mixed relationships with regulatory agencies (Ecology and Health)

Clean Neighborhoods

Success / Strengths

Neighborhood and youth strategies from the Solid Waste Plan have been implemented including:

- ✔ Strong **volunteer stewardship** continues in community programs.
- ✔ **Environmental justice** outreach project implemented.
- ✔ Began **integration of schools** program.
- ✔ Coordination with neighborhood districts.
- ✔ Successful **graffiti removal** for public facilities.
- ✔ Strong **private partnership** for downtown graffiti removal on private buildings.

Challenges / Opportunities [♦ = key challenge for 2001-05]

Prevention of littering, dumping, and graffiti requires continuous outreach, education, and removal. The job is never done.

- ❑ Management identified need for clarity on the role of clean city services in our **core mission**. ♦
- ❑ Expand opportunities for **youth and minority outreach** and training, as described in the Solid Waste Plan.
- ❑ Pursue implementation of **integrated school resources** and increased private sector involvement in graffiti removal, as described in the Strategic Business Plan.
- ❑ **Illegal dumping** continues to be a problem.

[5] Opportunities for service improvements include:
- Change staff shifts to manage peak loads and moving to off-peak hauling and increase staffing and equipment and improve backup systems for emergencies.
- Improve coordination with contractors on service access and reduce simultaneous contractor and self-haul transfer.
- Reward staff innovation and best practices.
- Utilize operations data and reduce underweight hauling loads,
- Improve HHW access.

Department Services

Policy and Planning

Success / Strengths

- ✔ Strong **overall policy direction** with the adopted Solid Waste Plan that emphasizes progressive and sustainable solutions.
- ✔ Comprehensive **data collection and evaluation** over many years provides a good foundation for program development.
- ✔ **Recycling Potential Assessment** model offers a tool to evaluate program costs and benefits.
- ✔ Stakeholder and customer opinions included in development of Plan, new curbside contracts and new programs.

Challenges / Opportunities [♦ = key challenge for 2001-05]

- ❑ Programs are disconnected. Program review and approval should be more comprehensive. ♦
- ❑ Limited internal planning leadership and staff for implementing new waste reduction and recycling programs and capital projects.
- ❑ Need to envision the overall collection, transfer, recycling, and disposal system that will maximize both efficiency and dynamic diversion opportunities. Providing for short-term needs as well as a stepping stone to the long term future.
- ❑ Limited leadership for integrating major regional issues such as green house gas reduction.

Communications

Success / Strengths

- ✔ New Communications Plan with emphasis on integrating outreach across Lines of Business.
- ✔ Increased involvement in staff meetings and program delivery.

Challenges / Opportunities

- ❑ Increasing waste reduction and reuse and diversion of currently recyclable materials.
- ❑ Continued integration with other Water and Drainage initiatives.
- ❑ Limited solid waste emphasis and expertise.
- ❑ Increase opportunities for education through bill inserts and @Your Service.

Customer Service

Success / Strengths

- ✔ Respond to high volumes of calls and diversity of requests.
- ✔ Committed to providing good service, despite difficulties with new computer system.
- ✔ Improved integration with inspection services.

Challenges / Opportunities [♦ = key challenge for 2001-05]

- ❑ Most calls are forwarded to solid waste customer service staff. Call Center agents do not have efficient access to information for handling many of the customer issues and concerns, limiting the 'one-stop' response. ♦
- ❑ Calls are not getting answered promptly. Solid waste agents are receiving an increased share of calls with reduced access to customer information.
- ❑ Commercial customers are confused on customer service resources.
- ❑ Customer service staff could be more involved in program development, staff training, and customer feedback on current initiatives.
- ❑ Improved coordination between Call Center, Specialty Team, Contractors, and Field Staff.

Information and Technology

Success / Strengths

- ✔ New Commercial Solid Waste system provides comprehensive data tracking for new commercial contract services.
- ✔ Improved data connections at transfer stations.
- ✔ Staff well equipped with current hardware and software.

Challenges / Opportunities [♦ = key challenge for 2001-05]

- ❑ Need to improve and update CCSS functions and/or provide alternate software for solid waste services. CCSS implementation has been disruptive for solid waste services, with decreased speed and access to customer information. ♦
- ❑ Coordination and use of solid waste data resources. Integration of real time data at stations.
- ❑ Access to customer data for field staff through mobile technology.
- ❑ Coordination of customer data with service contractors.

Human Resources

Success / Strengths

- ✔ Highly skilled and knowledgeable workforce.
- ✔ Flexible use of temporary employees.

Challenges / Opportunities [♦ = key challenge for 2001-05]

- ❑ Potential new positions to manage new services, programs, and CIP projects. ♦
- ❑ Limited staff w/historical solid waste knowledge (such as finances, contracts, programs) and/or skills (such as heavy equipment operation).
- ❑ Limited support for staff to innovate and adopt best practices.
- ❑ Dependence on temporary employees.
- ❑ Reduced employee advisory opportunities. Staff anxiety and distrust in operational changes.
- ❑ No opportunities for all solid waste staff to meet.

Finance (see Chapter 6)

Success / Strengths

- ✔ Bond rating among the highest in the country.
- ✔ Stable rate path.

Challenges / Opportunities [♦ = key challenge for 2001-05]

- ❑ Revenues and reserves not sufficient to cover increased capital and program demands.♦
- ❑ Potential long-term needs to finance and manage major capital program.
- ❑ Opportunities to decrease expenditures through contract payment audits and to increase revenues through service level audits and enforcement of extra garbage and yard waste.
- ❑ Limited resources for managing new commercial sector finances.

4. Financial Condition

The Solid Waste System has some of the highest bond ratings of any Solid Waste Utility in the country. Among the strengths of the system cited by Moody's and S&P are a stable revenue base and strong financial operations. In addition, a strong economy, renegotiated collection and disposal contracts, and the efforts of SPU staff to control spending have allowed remarkable rate stability in the Solid Waste Fund (SWF) in recent years. In fact, many solid waste customers have seen no rate increase since 1994. However, increased CIP spending in the next two rate periods will likely require a larger reliance on debt financing and modest rate increases.

Financial Policies

The Mayor and Council have established financial policies by Resolution for the Solid Waste System. In accordance with these policies, solid waste rates are set to achieve generally positive net income, a year end cash balance of $3.5 million and debt service coverage of 1.5 times annual debt service. These financial policies are subject to change by the Mayor and Council.

Current Financial Performance

- **Net income**: SPU expects net income to be positive for 2001 and consistent with the rate study.
- **Cash balance**: Cash will be below the rate study forecast because of commercial contracts costs and final settlement with the Port of Seattle for work on Harbor Island and the West Seattle Landfill.
- **Debt service coverage**: Additional revenue from the commercial contracts will increase the already strong coverage of the system's $45M of outstanding debt.
- **Bond Ratings**: SWF bond ratings (A1/A+) are among the highest for solid waste utilities.

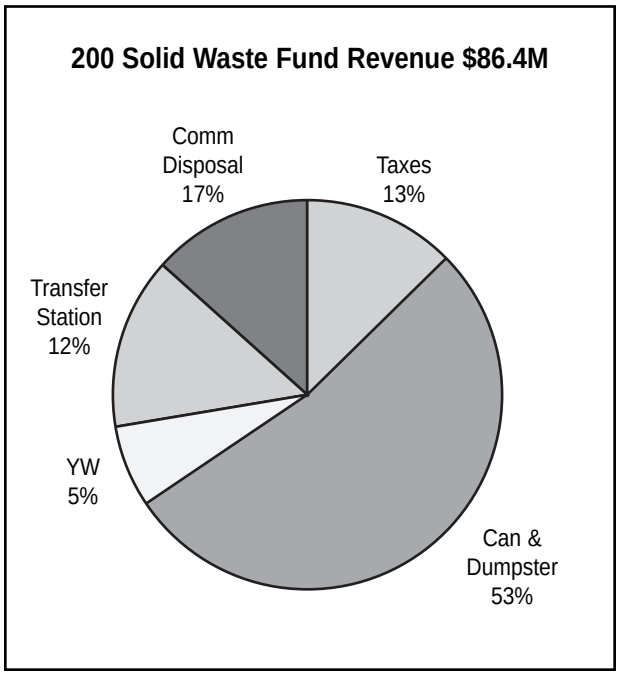
Major Financial Considerations for 2001 – 2006

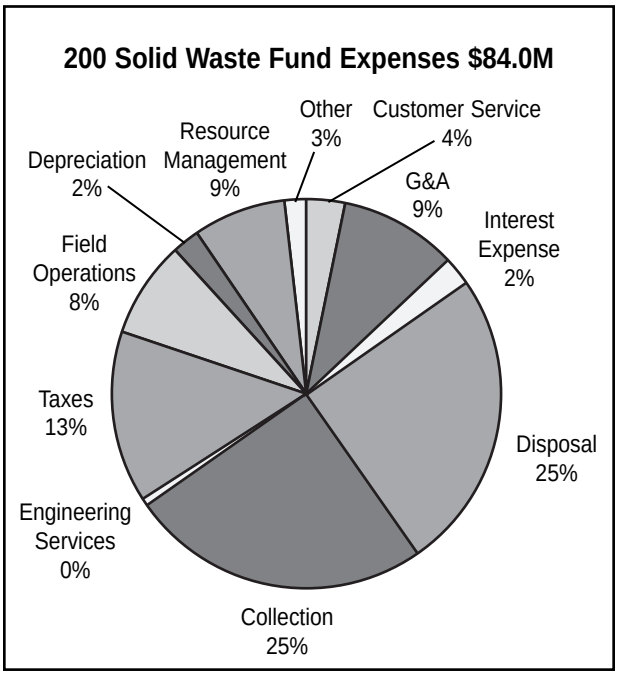
Financial considerations for the next five-years include:

- **Cash**: Cash is expected to be tight and below target for 2001. Cash will continue to be tight in subsequent years. As a result, the System will require another bond issue in 2002 and a modest rate increase in 2003.
- **Construction Fund Spending**: The SWF must complete spending of the 1999 bond issue no later than October 2002.
- **Facilities Master Plan Financing**: The facility master plan will significantly increase the size of the SWF CIP and will require new debt issuance and/or significant rate increases. A new financial policy, cash contribution to the CIP, should be considered. In addition, careful financial planning will be necessary to avoid rate spikes.
- **New programs**: Expanded services and environmental initiatives will need to be balanced with potential rate impacts.

Sources and Uses of Funds

There are four primary sources of solid waste revenue: residential collection revenue (can, dumpster and yard waste revenue), transfer station charges, commercial disposal fees, and taxes. Contract costs make up more than 50% of solid waste expenses. Field Operations, basically the operations of the recycling and disposal facilities and closed landfills, account for another 8% of expenses.

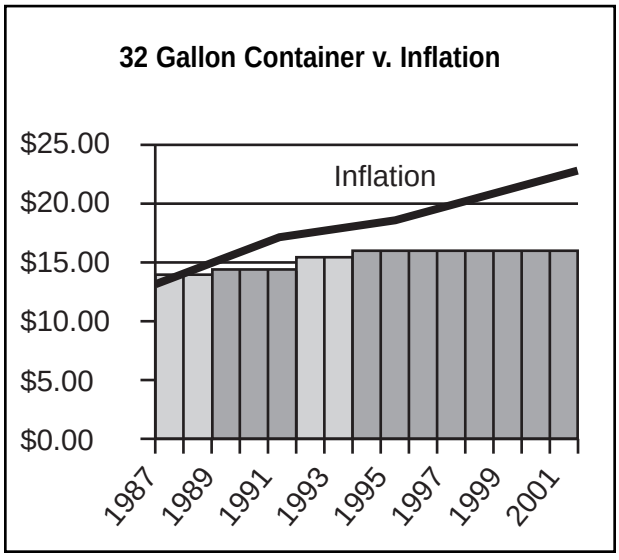


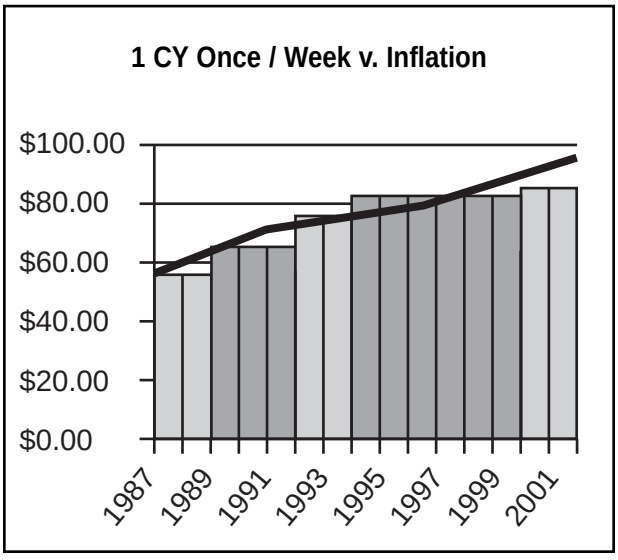


Other includes: amortization of landfill closure costs, expense offsets such as interest earnings, and grants. *Resource Management* includes: planning, community programs.

Rates v. Inflation

The rate for 32-gallon-container customers has not changed since 1994. Residential Dumpster rates increased by an average of 8% in 2000, the first rate increase for that class since 1994. In April 2001, the City assumed authority for commercial rate setting and rolled back those rates to 1994 levels.





Program Resources

The table below presents current solid waste resources for the primary program areas.

Solid Waste Fund Operations and Maintenance			
Program Area	**2000 Expenses**	**2001 Expenses**	**2002 Expenses**
Waste Reduction	$902,000	$821,000	$823,000
Product Stewardship & Sustainable Building	$695,461	$679,000	$683,000
Recycling	$5,646,797	$6,885,000	$6,998,000
Collection Services	$19,443,000	$30,985,000	$35,510,000
Transfer and Disposal	$27,515,000	$27,405,000	$26,816,000
Historic Landfills	$1,128,000	$1,221,000	$1,232,000
Clean Neighborhoods	$3,256,000	$3,083,000	$3,096,000
Department Services	$14,131,000	$14,810,000	$15,016,000
Debt Services	$5,374,000	$5,357,000	$5,350,000
Taxes	$11,168,000	$18,749,000	$20,880
Total	**$89,258,000**	**$109,992,000**	**$116,403,000**

5. Emerging Trends

Evolving Waste Management Paradigm

In the 1960's the City's solid waste mission was to collect, transfer, and dispose of garbage to protect public health. Today the mission of solid waste management entities around the world has expanded dramatically. We no longer think of waste management as a linear cradle to grave process, but as a cycle of renewal. While public health protection – from both pathogens and exposure to chemical hazards – remains critical, resource conservation and the reduction of environmental harm are recognized as equally important.

In the 1980s and 90s the focus was on the "three-legged stool" of waste reduction, recycling, and market development – symbolized by the familiar recycling icon. Through the development and implementation of the *1988 Solid Waste Plan: On the Road to Recovery,* Seattle became one of the earliest cities in the country to make recycling a programmatic priority. In the years following the initiation of Seattle's curbside recycling program, the City was recognized as the national leader. By the end of the century recycling had become a standard service and a fundamental customer expectation – not only in Seattle but also in most other U.S. cities.

The paradigm for the beginning of the 21st century has shifted even further away from the notion of "waste". Zero Waste, Waste Prevention, Sustainability, and Product Stewardship are the key concepts that drive the contemporary approach to solid waste management. The *1998 Plan: On the Path to Sustainability* incorporates these ideas, and reflects the City's broad overall commitment to sustainability. The role of recycling in reducing greenhouse gases and its beneficial contribution to climate change problems are being increasingly recognized. These and other "external benefits" (besides financial cost savings) will become more quantifiable and more important criteria for program implementation.

Solid waste management has become resource management. And the responsibility is shifting from the end of the product life cycle to the product conception and design stage.Today this change is well underway in Europe and Asia. In the United States it is less well-developed, and local as well as state and federal governments have an important role to play in facilitating or mandating strategies to promote its implementation. The challenge for Seattle over the next 10 years is to continue to play a leadership role as the new paradigm evolves.

Future Customer Base – Changing Demographics

Seattle's population has been relatively stable for over 10 years, and is not expected to grow significantly. However, the population in the Puget Sound region as a whole continues to grow, and this increases the potential tons of recyclable materials available, and may make investment in local and regional processing or re-manufacturing plants more attractive. To the extent that Seattle's population does increase, it will be mainly in multi-family dwellings, which create more difficult challenges for collection programs than single-family dwellings.

However, we can expect important changes in population demographics – both ethnicity and age. It is expected that the population in Seattle, as in other urban areas, will become more diverse, leading to the need for broad involvement in program planning to meet the needs of different communities, and more diverse outreach strategies to ensure that all citizens participate. The increasing numbers of elderly – as the baby boom generation ages – will also create the need for services and programs that respond to the expectations of this community.

Emerging roles for Seattle's Systems and Infrastructure

Seattle has been innovative and creative in establishing a collection and disposal infrastructure – through contracts with private sector service providers – to support the needs of changing goals. Collection services are efficient, cost-effective, and generally well regarded by customers, although the City's transfer stations are inadequate for current, and future needs, and badly in need of maintenance.

In the long term, as producers take on shared responsibility for managing products at the end of their useful life, SPU collection and transfer services may evolve very differently from the way they are today. In particular, the overall infrastructure will need to be designed for flexibility - to be able to respond quickly to evolving needs and priorities as new materials, new processes, and new roles develop. In the shorter term, existing facilities can be designed to provide a more efficient infrastructure to support upcoming disposal needs and to maximize waste reduction and recycling.

Prevention and Zero Waste

"It's not garbage anymore." Roughly one third of the material being landfilled (from residential and commercial generators) is food waste and compostable paper. Another third is recyclable paper and cardboard. Approximately 10% of the commercial garbage, and 56% of the self-haul garbage is recyclable construction debris – one of the most rapidly growing markets today.

Seattle's challenge is to take advantage of opportunities to implement effective programs for diversion of these streams, including possible cooperation with other private or public sector partners. There are also other products – notably electronics, which pose special problems in the garbage besides quantity. It is being confirmed that CRTs (from TVs and computer monitors) designate as dangerous waste, and regulatory agencies are unlikely to turn a blind eye to "business as usual" disposal in the garbage for much longer. The challenge for the City is to support programs for the management and reincarnation of electronics and other products, which ensure that producers take on a share of the responsibility.

Beyond diversion, waste prevention is given little tangible attention or resources. In the new waste management environment, Seattle has the challenge of identifying and implementing strategies which will lead to real changes in production or consumption behavior resulting in less waste. Identifying appropriate roles for governments, producers, and consumers will be an important aspect of effective waste prevention.

As local governments become more vocal about producer responsibility, it will be important to ensure that the City demonstrates leadership by taking its share of responsibility. This includes continued improvements in purchasing practices to support product stewardship and help increase markets for recyclable materials, as well as more visible and comprehensive City-wide waste prevention and diversion programs.

National and Regional Challenges and Opportunities

At the national level, the recent economic downturn is likely to result in reduced waste generation, and thus reduced revenues from garbage disposal.[6] It is also likely to affect market prices for recyclables (in fact, market prices have been declining for over a year), which will reduce the cost-effectiveness of Seattle's programs.

The federal administration's proposed energy policy offers tax credits for landfill gas recovery, and support and incentives for waste-to-energy. To the extent that these encourage increased landfill disposal and garbage incineration, they are counter to the larger goals of resource conservation. If there are any near-term

[6] This only emphasizes the importance of encouraging a shift in costs away from end of life management of garbage through rates, into the cost of the product.

renegotiations in our disposal contract, it will be important to maintain current policies and incentives for reduced rather than increased waste generation.

The IRS has issued a new rule which eliminates tax exempt bonds for recycling facilities. This reduces economic incentives for the development of recycling infrastructure, and may affect development of facilities for new materials in the Northwest.

Generally, the current federal climate creates barriers to sustainable resource management. At the state level however, things are more hopeful. The State Department of Ecology has developed Sustainability Principles, and is in the process of drafting a State Solid Waste Plan with a vision built in part on these principles. Local Solid Waste Plans are prepared within the context of the State Plan – Seattle's next Plan update will be due in 2003. Governor Kitzhaber of Oregon recently issued an executive order that "The State of Oregon shall develop and promote policies and programs that will assist Oregon to meet a goal of sustainability within one generation - by 2025."

Upcoming Regulatory Issues

Washington has recently funded a program to phase out PBTs (persistent bioaccumulative toxins) by 2020, including mercury. This will affect many mercury-containing products, including thermometers, fluorescent lights, thermostats, and so on. Ecology is expected to develop a Universal Waste rule regarding these products. Product Stewardship initiatives associated with mercury-containing products (essentially this means reformulations/redesigns that don't use mercury) are in place in the northeastern states, and moving westward.

Ecology is developing a special exclusion from its Dangerous Waste regulations to allow for recycling of certain products which designate as dangerous waste – specifically electronics. This will create an incentive for the development of the infrastructure for electronics recycling, currently in its infancy.

Progressive Strategies in Other Places

- Portland, OR has achieved a Citywide recycling rate of nearly 54% (including containers diverted through a bottle bill), and has a goal of 60% by 2005. Their programs include:
  - ➢ Requirement that the City's 20,000 businesses separate recyclable materials and set out at least 50% of their waste for recycling. In 1993, only 18% of businesses recycled four or more materials. By 1999, that number had jumped to 82%.
  - ➢ Requirement that multi-family complexes provide recycling service for at least 5 materials.
  - ➢ RFP for private development of a processing facility on public property for commercial food waste and other organics. Private haulers will collect and deliver food scraps.

- The State of California has a 50% recycling mandate. Cities have various strategies for achieving this requirement:
  - ➢ Residents and small businesses in the Richmond and Sunset districts of San Francisco can recycle food scraps and soiled paper with their yard trimmings. Small businesses are charged for organics collection but receive a 25% discount.
  - ➢ San Francisco screens loads for household hazardous waste and removes toxic materials from garbage.
  - ➢ San Jose has initiated a deposit on construction and demolition debris. As long as the debris is taken to a city-certified recycling facility, they will get the deposit back.

- Several American cities use mandates to ensure strong participation in recycling. Chicago and Philadelphia have commercial recycling ordinances requiring the private sector to report recycling efforts. This results in reliable data about commercial recycling – making for more effective program planning.

- Canadian Provinces and cities are very innovative in their approach to sustainable waste management:
  - ➢ Toronto, Canada is planning a three-sort single family residential program: garbage and recyclables every other week, yard debris and kitchen scraps weekly. Goal 60% by 2006.
  - ➢ Ontario, Canada has introduced product stewardship legislation which will require packagers, beverage producers and retailers to provide $14 million to fund local recycling efforts. This is expected to pay half the costs of residential recycling.

- In Iowa a $5.00 fee collected when motor vehicle titles are issued goes to a Waste Tire Abatement Fund, half of which goes for market development. End users receive 50% of the cost of purchasing processed tire products.

Twenty-five Year SPU Vision

SPU's vision for the future builds on emerging trends and includes:

- Zero waste is a reality. Garbage disposal is obsolete. All products are manufactured so that they can be composted at the end of their useful life, or so that the components/materials can be recovered for recycling or reuse

- **Financial infrastructure has shifted** to support management of product life-cycles. Costs are incorporated into product prices instead of into broad-based rates. Public/private partnerships provide the infrastructure for efficient product and material succession.

- **Local product and material reclamation is cost-effective** as a result of technological advances and increased costs of virgin resources. More processing and re-manufacturing is carried out locally in eco-industrial parks, reducing the impacts and costs of long-distance transportation and creating jobs.

- **Resource conservation is routine habit** for all City residents. Water, energy and material resources are used sustainably.

Appendix B

Public Involvement in the Development of the 2004 Solid Waste Plan Amendment

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Public Involvement in Development of the 2004 Solid Waste Plan Amendment

Public participation for the 2004 Solid Waste Plan Amendment was focussed around the two key initiatives that are driving the important programs for the future. These are

1. "Sustaining our Commitment", a package of programs projected to achieve the City's 60% recycling goal by 2010.

2. The Solid Waste Facilities Master Plan which identifies options for expanding and rebuilding current facilities and for new facility development.

In addition, the City's Solid Waste Advisory Committee (SWAC) – a citizens' advisory committee - has provided input to the Plan Amendment.

Sustaining our Commitment

In December 2001, SPU held a forum with fifteen representatives from a diverse group of Seattle businesses – including retailers, hotels and restaurants, manufacturing and high rise office buildings. Participants identified barriers and challenges to increased recycling, and commented on a list of program proposals for increasing commercial recycling and achieving the 60% recycling goal.

SPU also hosted a discussion with five key recycling service providers in the Seattle area to obtain feedback on program proposals.

Programs presented in this Plan Amendment incorporate modifications that reflect issues raised during these stakeholder meetings. Specific modifications include expanding the curbside recycling program to all business accounts, ensuring that disposal bans only apply to materials where viable, economic recycling options exist, and expanding technical assistance to property managers.

During 2003, SPU staff attended several meetings of the Greater Seattle Chamber of Commerce's Utilities Task Force to discuss concerns about the paper disposal ban. Committee members felt that business waste prevention activities were not adequately acknowledged by SPU. As a result, the Ordinance implementing the disposal ban also requires SPU to measure and give credit to businesses for waste prevention activities.

In October 2003 Councilmember Margaret Pageler hosted a series of Roundtables to identify concerns, solutions and alternatives to the proposed disposal bans. Input was received from hotels and restaurants, major

institutions, apartment owners and medical facilities. This input was considered in developing the Administrative Rule and strategies for implementing and enforcing the bans, and for identifying exceptions.

A 1999 Focus Group of Seattle residents identified barriers to increased recycling. Many mentioned lack of on-going information, education and promotion about recycling and its benefits. A strong emphasis on public education was incorporated into the 60% proposals as a result.

Solid Waste Facilities Master Plan

The preparation of the Draft Solid Waste Facilities Master Plan (SWFMP) included a public involvement strategy which engaged multiple stakeholder groups. The process included public forums, community group briefings, a customer survey, distribution of fact sheets, and on-line information. Details about the public involvement process are in Appendix B of the draft SWFMP, which can be found on-line at www.seattle.gov/util/About_SPU/Garbage_System/Plans/Solid_Waste_Facilities_Plan/

Solid Waste Advisory Committee (SWAC)

SPU provided regular briefings for the SWAC and its subcommittees during the development of the Plan Amendment. SWAC provided input to SPU on a preliminary draft. The final Plan Amendment includes revisions that reflect much of this input.

Key SWAC issues were

- To ensure that short term (5-year) actions described in the Amendment were consistent with a longer term sustainability vision,
- That proposed programs retained a strong focus on waste prevention and recycling, including incentives for waste prevention and recycling behavior,
- To strongly support the value of public place recycling, despite the high costs, and to support an on-going commitment to Clean City programs,
- To support an assessment of old in-City landfill status.

SWAC provided separate comments on the Facilities Master Plan.

Appendix **C**

Sustaining our Commitment – January 2003

Sustaining our Commitment:

Mayor Nickels' Plan to Reaffirm Seattle's Leadership in Recycling

January, 2003

SECTION 1 - INTRODUCTION

For the last 14 years, Seattle's recycling goal of 60% has been a cornerstone of the environmental ethic of its citizens and a foundation of our efforts to become a more sustainable city. Over the years, the City, in partnership with the private sector, has introduced innovative and convenient programs to reduce the amount of materials that are lost to the landfill each year. But recently calculated 2001 figures show a continuing drop in our recycling performance, from 40% in 2000 to 38% in 2001 (see Section 2). The City Council, by Resolution 30555 and Statement of Legislative Intent, has requested an Executive analysis and proposal of the future of recycling

This document, developed by Seattle Public Utilities and directed and endorsed by Mayor Nickels, serves three main purposes:

First, this document reviews the recycling performance by sector.

Second, the Executive recommends that the City recommit itself to the overall 60% recycling goal. In the 14 years since the goal was first established, we have developed a deeper understanding that long-term sustainability is built through systematic and consistent environmental improvements. The current assessment is a refinement of previous projections based on most recent data and expectations.
Third, the Executive proposes a specific set of ten programs, most of which would start in 2004 (see table in Section 3), that are projected to add over 20 points to our current 38% recycling rate, making tremendous strides toward our overall 60% goal.

This pragmatic, 10-point proposal:
- ✓ focuses on the commercial sector, where there is the greatest need for improvement,
- ✓ includes mandatory programs which divert the greatest number of tons for the least cost,
- ✓ recommends commercial food waste collection contingent on price proposals, and
- ✓ broadens the scope of waste reduction activities to incorporate additional product stewardship.

Together, the 60% goal and this set of programs will reconfirm Seattle's position as an international leader in recycling and sustainability.

SECTION 2 – HISTORY AND BACKGROUND

- ***1989 Solid Waste Plan: "On the Road to Recovery"***

The Plan
Seattle established the goal of recycling 60% of its municipal solid waste in 1988, and identified specific programs for achieving this goal in the 1989 Solid Waste Plan "On the Road to Recovery".

The goal was based on a detailed assessment of possible recycling programs and their performance potential. An econometric model, the Recycling Potential Assessment (RPA) model, was developed for this purpose. Resolution 27871, which set up the framework for the 1989 Plan stated –

"The City recycling goal shall be to recycle, compost or avoid production by 1998 of 60% of the total combined residential and commercial waste which would otherwise be generated within the City."

Resolution 27871 also listed criteria for designing recycling programs, which included:

- Maximum diversion.
- Long-term cost-effectiveness.
- Least environmental harm.

"On the Road to Recovery" also acknowledged waste reduction as the highest priority waste management strategy – reflecting the hierarchy established by the State.

The Plan proposed a series of consumer education programs and support for legislation, which would reduce the amount, or toxicity of wastes.

The Outcome
In the late 1980's and the early 1990's, Seattle implemented curbside recycling of paper, bottles and cans; curbside collection of yardwaste for composting; a backyard composting program; and several recycling improvements at our transfer stations. Between 1988 and 1995 Seattle's residential ratepayers saved $12 million by recycling instead of throwing everything in the garbage. The savings have continued since that time.

During that same period, the City's overall recycling rate increased from 25% to 44%. While this was an impressive achievement, it fell short of the goal of 60%.

Waste reduction programs were initiated, including the popular and successful

back yard composting program.

- ***1998 Solid Waste Plan: On the Path to Sustainability***

The Plan
In 1998 a new Solid Waste Plan "On the Path to Sustainability" was adopted. It was guided in part by the "Sustainable Seattle" principles of the recently adopted Comprehensive Growth Management Plan.

The principles of Sustainability recognize the long-term environmental benefits of conservation programs such as recycling, as well as the purely monetary benefits.

The 1998 Plan reaffirmed the goal of 60% recycling, and extended the date of accomplishing this goal to 2008. The goal was broken down by sector as follows, based on an assessment of programs proposed for each sector.

Sector	1995 Recycling	2008 Goal
Single family	60%	70%
Multi-family	13%	37%
Commercial	48%	63%
Self-haul	17%	39%

These goals were based on an analysis of current program performance, waste stream composition data, studies and surveys in the region and around the country about potential performance of new programs, and meetings with businesses, recyclers and other stakeholders.

The 1998 Plan adopted Zero Waste as a guiding principle – and proposed both "traditional" waste reduction programs as well as a new emphasis on product stewardship.

The Outcome

1. Recycling

Most of the programs proposed in the 1998 Plan have been implemented or initiated.

Since 1998 an improved curbside residential program was established, with new materials added. A hauler incentive to sign up multi-family premises was successful, and as of December 2002, 82% of multi-family premises are signed

up for recycling service. Small businesses were added to the residential curbside program, and 525 out of 1600 are currently participating.

A great deal of planning work has been done on development of an efficient self-haul Reuse/Recycling Center, especially for construction debris. A Facilities Plan is currently underway which will include options for optimizing self-haul recycling. Public place recycling has also been piloted.

Despite this, the City's overall recycling rate dropped to 38% in 2001. The decline was almost entirely due to commercial sector recycling which declined from 48% to 37%. This drop is probably due in large part to a decline in market prices for recyclable materials, which reached a high in 1995 and have dropped since. Not only does this reduce the prices that generators might receive for recyclables such as high grade paper thus reducing their incentive to recycle, but it also reduces the incentive for collection companies to promote recycling services as they have less to gain[1].

City of Seattle Recycling Rates

	Single Family	Multi Family	Total Residential	Self Haul	Commercial	Overall
1995	60.6%	13.1%	48.9%	17.2%	48.2%	44.3%
2000	58.0%	17.8%	47.8%	17.2%	41.6%	40.0%
2001	57%	22%	48.5%	17.8%	36.7%	37.9%
Goal	70.0%	37.0%	60.0%	39.0%	63.0%	60.0%

2, Waste Reduction

During the past four years, SPU has continued and expanded its popular back yard organics programs - back yard composting and natural lawns. These programs also promote reduction in the use of toxic products in our lawns and gardens, a key component of waste reduction.

Consumer education programs struggle against a culture that spends millions promoting consumption, makes "throw away" cheap and convenient, and where durability and reparability are increasingly hard to find. For this reason, SPU has significantly reduced its investment in waste reduction education, except for

[1] More detail on market prices can be seen on SPU's web page at http://www.ci.seattle.wa.us/util/solidwaste/docs/reports/CommRecyMrkt.PDF

organics. Instead, product stewardship programs have been implemented to address new strategies for reducing the quantity and toxicity of wastes.

- ***Opportunities for the Future***

  The following table shows generation, disposal and recycling in 2001, and the tonnage of new recycling needed to meet the recycling goals set in the 1998 Plan (in 2001 tons). The difference between current recycling and sector goals shows the greatest opportunity for increasing recycling is in the commercial sector, and least in multi-family.

Sector	2001 generation	2001 disposal	2001 recycling	Ultimate recycling goal per 1998 Plan	Difference between actual recycling and goals
SF residential	212,000	91,100	120,900	148,400	27,500
MF residential	68,600	53,500	15,100	25,400	10,300
Commercial	360,900	228,400	132,500	227,400	94,900
Self-haul	124,500	102,300	22,100	48,500	26,400
Totals	***766,000***	***475,300***	***290,600***	***449,700***	***159,100***

The next table shows tons of recyclables disposed in the garbage in 2001 based on recent waste stream composition studies[2]. This shows that the greatest opportunities for increasing recycling are

- recyclable paper from residential and commercial sectors,
- construction and demolition debris from commercial and self-haul sectors,
- food waste from businesses and residents.

[2] Commercial and self-haul waste stream composition study – 2000. Residential waste stream composition study – 1998/1999.

Materials	SF residential	MF residential	Commercial	Self-haul
Convenient recycling currently available				
Recyclable paper	15,200	14,200	38,800	4,200
Other "traditional" recyclables[3]	4,500	3,300	14,200	300
Clean wood			13,700	12,500
Ferrous metal			8,200	4,300
Yard waste			5,300	6,200
Other C&D and reusables				19,300
Totals	***19,700***	***17,500***	***80,200***	***46,800***

Potentially recyclable				
Food waste and compostable paper	34,100		70,800	1,200
Totals	***34,100***		***70,800***	***1,200***

In addition to the above quantities of paper in the garbage, more than twice as much is recycled. Paper reduction is an obvious opportunity, although finding user-friendly strategies may be challenging.

Other key waste reduction opportunities involve toxic and special wastes which are hard to handle safely, and may increase the City's liability when landfilled. These include electronics, mercury-containing products, pesticides, etc.

[3] Means – bottles and cans for residential sector, bottles and cans plus plastic containers and plastic film for commercial

SECTION 3 – THE PROPOSAL

This plan proposes the implementation of ten specific programs listed below, along with their projected contribution to the citywide recycling rate.

Sector	Program	New tons recycled - fully developed programs	Adds to % recycling[4]	Proposed start
Commercial	Expand curbside recycling to all businesses	4,900	0.6%	2004
	Paper disposal ban	33,100	4.1%	Phase in 2003-2006
	Food waste collection	31,800	3.9%	2004-05
	Commercial yard waste disposal ban	3,800	0.5%	2003
	Public Place Recycling City-wide – 300 high pedestrian sites	80	0.01%	2004
	Waste reduction and reuse	8,250	1%	On-going
Residential	Curbside materials disposal ban	36,300	4.3%	Phase in 2004-2006
	Back yard food waste composting	1,500	0.3%	2004
	Waste reduction and reuse	8,250	1%	On-going
Self-haul	Reuse/recycling center	39,000	4.7%	2008 (est)
Total		**167,000**	**20.4%**	

The following section provides descriptions of each program proposal and implementation strategies. It also identifies levelized cost/ton for each program averaged over 20 years, 2004 - 2024.

[4] When program fully ramped up. Percentages are percentages of total waste generation.

❑ Cost and Tonnage Calculations

The projected recycled tonnages, costs and benefits of the programs in this proposal are calculated for each individual program in the following way.

1. Tons

The solid waste stream is divided into four sectors: single family, multi-family, commercial and self-haul. Historical data from 1988 are kept for each of these sectors. The relevant numbers are waste generation, waste disposal, and recycling.

Waste generation = Waste disposal + recycling

SPU measures on an on-going basis, actual residential and self-haul waste disposal and recycling, from which generation is derived. SPU also measures actual commercial waste disposal. Commercial recycling (a service not fully provided by SPU) data are provided by annual Department of Ecology surveys. We work closely with DOE to assure that Seattle data are as accurate as possible.

Recycling rate means the percentage of total generation that is recycled. This can be expressed for the City as a whole, or for the separate sectors. For example in 2001 Seattle's recycling performance was as follows

475,300 disposed +	290,500 recycled =	765,800 generated
62%	38%	100%

Future waste generation is projected based on population and employment data from City Light and past trends.

Further, waste generation is broken down into its component materials (paper, glass, food, etc. etc.) for each sector based on waste stream composition studies.

In order to project how many tons would be recycled from a new program, we identify the sector(s) and material(s) that will be affected, and use assumptions about user behavior to determine anticipated diversion of each material from garbage to recycling. The basic behavior assumptions are participation and efficiency. For instance, if we have a residential food waste collection program, how many residents would participate, and what percentage of their food waste would they set out for collection (efficiency)? These assumptions are based on past experience, pilot projects, surveys, and data from other cities. This diversion assumption is then "run" against generation projections to determine how many tons will be diverted.

As a simple example, suppose in year 1 there are 100,000 tons of residential wastes generated, of which 38% is already recycled. Assume no food is currently recycled, but makes up 40% of garbage disposed. Further assume that 50% of residents will participate in a food waste program, and put out 75% of their food wastes.

Year 1
100,000 generated
38,000 recycled
62,000 disposed
62,000*40% is food = 24,800
24,800*50%*75% = 9,300

In this example, we project that 9,300 tons of food would be diverted to recycling in year 1 of the new program. The same projections are made for future years.

The Recycling Potential Assessment model is the primary tool for calculating these projections. The tonnage diversion figures shown in the appendices are derived in this way.

The performance of all the proposed programs added together provides the total projected recycling rate for any given future year.

2. Program Costs and Benefits[5]

Projected program costs include all new costs, including labor (additional customer service needs, for instance), promotion, collection and processing, special equipment, and so on. Program costs are shown in Appendices 2 and 3.

Program benefits are the avoided disposal costs of shifting tons away from garbage to recycling. These are the variable costs associated with garbage collection, transfer and disposal.

Net costs are the difference between program cost and program benefits. If the benefits are greater than the costs, then the program is a net savings. In the Appendices, this is shown by a negative number in the net cost line. If the benefits are smaller than the costs, then the program is a net cost. In the Appendices, this is shown by a positive number in the net cost line.

[5] For the purposes of this report, we have shown ONLY costs to SPU, as these are the costs that affect rates. We have not shown total system costs, that is, the costs to all parties whether SPU or private. In every case except for the commercial paper ban, SPU costs and system costs are the same.

SECTION 4 – INDIVIDUAL PROGRAM DESCRIPTIONS

❑ Waste Reduction

This section addresses both residential and commercial sector waste reduction. As always (with the exception of back yard composting), there are significant difficulties in measuring waste reduction. The programs described reflect what we judge to be a reasonable level of effort/cost. Similarly, we have reflected what we judge to be a reasonable level of tonnage diverted from the waste stream.

1. Back Yard Food Waste Composting

This program builds on the already successful back yard composting programs, with the goal of diverting more food waste, which is the largest single "recyclable" material currently going into the garbage.

SPU stopped distributing containers such as the Green Cone for back yard food waste composting in 2001, when the back yard organics program turned to other priorities such as grasscycling and natural lawns. However, a 2000 survey indicated that 25,000 non-composting households would be "extremely" or "very likely" to compost food waste. So as there is a large percentage of food waste tons in the residential garbage, expanding this program is a good opportunity to increase diversion, and survey data suggest it will be successful.

In this program, SPU would distribute 2,500 food waste composters every year for 8 years starting in 2004. Interested residents would pick up their containers at well-publicized events. Educational materials would be provided, and the existing compost hotline would be available to answer questions.

The annual tonnage diverted from the landfill in 2008 is projected to be 1100 tons, and would increase the citywide recycling rate by 0.1 %. The annual tonnage diverted from the landfill in 2010 is projected to be 1,500 tons, and would increase the citywide recycling rate by 0.3%. In 2000, Seattle residents composted an estimated 4,000 tons of food waste in their back yards. The net cost of this program to SPU is $11/ton averaged over 20 years. Other cost and tonnage data are in Appendix 3. Cost and tonnage data are planning estimates and therefore subject to a range of uncertainty.

2. Consumer education

This program will focus primarily on commercial office environments, with the goal of at least making double-sided copying and printing standard behavior. We will also investigate available tools for electronic filing and document storage, and

explore their potential for user acceptance. Effective strategies will be promoted.

Other outreach programs will target throw-away products, and less toxic products.

3. Product Stewardship

Advancing Product Stewardship is much more effective at a regional or national level, as opposed to a strictly local level. Accordingly, our strategy would build on the City's current efforts as part of the regional Northwest Product Stewardship Council, which is evolving as a national leader in this field.

It would involve continued development and support for pre-product stewardship programs, such as the regional Take It Back! Network for computers and TVs, as well as support for research and/or trial programs to help model effective implementation strategies. It would also include Seattle's share of responsibility if product stewardship programs are implemented. For instance, current state legislation for mercury products and electronics, as well as nation wide negotiations with electronics manufacturers may be successful. If so, our contribution could include assistance with planning, public education and possibly oversight.

Another way to encourage manufacturers to take back products at the end of their lives is for large purchasers to require take back in procurement specifications. We would develop model specifications for target products, and promote the concept to local businesses as a way to save money as well as promote an environmental program.

4. Reuse

Current activities such as "Use it Again! Seattle" and neighborhood yard sale incentives will be revised and expanded. Information about sources of reusable building materials will be promoted more widely, and projects for reusing office products will be encouraged by the business assistance program.

The annual tonnage diverted from the landfill in 2008 is projected to be 12,300 tons, and would increase the citywide recycling rate by 1.5 % . The annual tonnage diverted from the landfill by the above three programs in 2010 is projected to be 16,500 tons, and would increase the diversion rate by 2%. This is about 30 pounds per resident/year and about 30 pounds per employee per year. One CRT or about 10 reams of paper weighs about 30 lbs, The net cost of this program to SPU is $27/ton averaged over 20 years. Other cost and tonnage data are in Appendices 2 & 3. Cost and tonnage data are even more uncertain than for recycling programs.

❑ Recycling

Commercial

1. Expand Curbside Recycling to all businesses

Currently 1,600 small business accounts are eligible for the City's residential curbside recycling. As an incentive to participate, recycling collection costs are covered by garbage rates.

At stakeholder meetings, business representatives expressed interest in expanding this service to all businesses. It provides collection for small quantities (90-gallon toter) of material for which private sector services are less available.

This program could be provided through the City's residential or commercial contracts. In either case, the price will have to be negotiated.

The program will be an optional service available to all commercial garbage accounts. Implementation will depend upon negotiating a satisfactory contract amendment with our present curbside recycling contractors. Its primary function is to provide a cheap safety net service for businesses who produce small quantities of recycling, and to mitigate the impact of a paper ban on these customers.

The annual tonnage diverted from the landfill in 2008 is projected to be 4,600 tons, and would increase the citywide recycling rate by 0.5 % . The annual tonnage diverted from the landfill in 2010 is projected to be 4,900 tons, and would increase the recycling rate by 0.6%. This would divert less than 10% of the recyclable materials that are currently going in the garbage. The net cost of this program to SPU is $37/ton averaged over 20 years. Other cost and tonnage data are in Appendix 2. Cost and tonnage data are planning estimates and therefore subject to a range of uncertainty.

Paper Ban

In 2001, businesses put nearly 40,000 tons of recyclable paper – including cardboard - in the garbage. Private services are readily available for all kinds of paper, high grade, mixed office and cardboard. Depending on the quantity and quality of the material to be recycled, businesses may pay, or get paid, for recycling. Businesses that recycle more can also save by reducing garbage container size or collection frequency. Businesses that generate small quantities are more likely to have to pay to recycle through private collection. However, the proposed City-provided recycling collection (see above) will provide a safety net service for these generators.

In 2003, the Executive will submit an ordinance which would mandate the separation of all recyclable non-contaminated paper products – newspaper, cardboard, and all paper, from garbage disposal. The ban would be phased in over 4 years, starting with large garbage generators. The ban would be preceded by a year of education, technical assistance, and tagging (see table below). Customer participation in a recycling service (as shown by the presence of a recycling container) would be taken as an important first indicator of compliance. But, SPU inspectors or contractors would provide random garbage dumpster inspections as well. Notices would be sent to non-compliant generators, with information and resources for technical assistance. Penalties would be a last resort.

Commercial Paper Ban Phase-in

	Education & Tagging	**Paper Ban**
Large garbage generators (approx. 5% of businesses/40% of garbage)	2003	2004
Medium generators (approx. 20% of businesses/45% of garbage)	2004	2005
Small generators (approx. 75% of businesses/15% of garbage)	2005	2006

The annual tonnage diverted from the landfill in 2008 is projected to be 31,700 tons, and would increase the citywide recycling rate by 3.9% . The annual tonnage diverted from the landfill in 2010 is projected to be 33,100 tons, and would increase the citywide recycling rate by 4.1% . This is expected to divert over 75% of the commercial paper currently going in the garbage. High participation and efficiency rates are assumed with a mandate. The net ***savings*** *of this program to SPU are $72/ton averaged over 20 years[6]. Other cost and tonnage data are in Appendix 2. Cost and tonnage data are planning estimates and therefore subject to a range of uncertainty.)*

2. Food waste collection and processing

In 2001 businesses put over 70,000 tons of food waste and compostable paper in the garbage. Approximately 5,000 tons of food waste were collected for composting. Previous studies have shown that businesses would participate in food waste collection if it were less expensive than garbage collection.

[6] In this report, costs are presented as SPU costs, rather than total system costs, because SPU costs are directly related to the rates SPU must charge for garbage services. The overall cost effectiveness of a program is determined by total system costs which for this program would also include costs to commercial customers of obtaining recycling services to comply with the ban.

One of the critical challenges for private sector development of additional food waste composting capacity has been uncertainty about the on-going availability of sufficient material to make capital investment worthwhile.

This program aims to alleviate this uncertainty by offering a City-provided food waste collection program with incentive rates – that is, rates lower than garbage collection – to encourage participation. This would provide enough food waste to support the development of a processing facility As the program is expected to have a net cost, total program costs would be covered partly by the food waste rate, and partly by increased garbage rates.

At this time, the Executive proposes to release an RFP in 2003, for collection and processing of commercially generated food waste. Implementation of the program will depend on the costs of the proposals, and potential rate impacts. Any program would need separate ordinance authority to execute a service contract.

The annual tonnage diverted from the landfill in 2008 is projected to be 30,200 tons, and would increase the citywide recycling rate by 3.7 % . The annual tonnage diverted from the landfill in 2010 is projected to be 31,800 tons, and would increase the citywide recycling rate by 3.9%. The net cost of this program to SPU is $95/ton averaged over 20 years. Other cost and tonnage data are in Appendix 2. Cost and tonnage data are planning estimates and therefore subject to a range of uncertainty.

3. Yard waste disposal ban

Residents have been prohibited from putting yard waste in the garbage since 1989.

This program closes a loophole and provides for consistency with the residential system, now that the City collects commercial garbage.

Enforcement will be through the contractors, or through random inspections by SPU inspectors. Enforcement could be combined with inspections for the paper ban – see above #2. The Executive will submit an ordinance in 2003 to establish this requirement

The annual tonnage diverted from the landfill in 2008 is projected to be 3600 tons, and would increase the citywide recycling rate by 0.4 % . The annual tonnage diverted from the landfill in 2010 is projected to be 3,800 tons, and would increase the citywide recycling rate by 0,5%. The commercial sector already recycles approximately 90% of its yard waste. This program captures most of the remaining, and diversion rates are expected to be high with a mandate. The net ***savings*** *of this program to SPU are $77/ton averaged over 20*

years. Other cost and tonnage data are in Appendix 2. Cost and tonnage data are planning estimates and therefore subject to a range of uncertainty.

5. Public Place Recycling

Public place recycling has value as an overall recycling education tool, and is a good way to demonstrate Seattle's reputation as a recycling City. However, costs are relatively high for small quantities of material.

This proposal is to install recycling containers at approximately 300 high pedestrian sites. There will be one container for glass, and one for other recyclables. Recycling containers will be near existing litter containers to minimize contamination.

The annual tonnage diverted from the landfill in 2008 is projected to be 80 tons, and would increase the citywide recycling rate by only .01%. The annual tonnage diverted from the landfill in 2010 is projected to be the same. This results in a trivial increase in the recycling rate, but its primary purpose is education, not diversion. The net cost of this program to SPU is $2,777/ton averaged over 20 years. Other cost and tonnage data are in Appendix 2. Cost and tonnage data are planning estimates and therefore subject to a range of uncertainty.

Residential

1. Curbside ban on recyclable materials

Although residents continue to recycle enthusiastically, both single and multi-family sectors are still short of achieving recycling goals. In 2001 residents put over 37,000 tons (based on 1998 waste stream composition studies) of paper, bottles and cans in the garbage. About 80% of this was recyclable paper.

This program aims to capture the remaining "easy to identify" recyclables by banning the disposal of paper, cardboard, bottles and cans. The ban will be phased in over three years

2004 - education and outreach
2005 - warning tags put on garbage cans with recyclables (garbage picked up, but educational tag left)
2006 - ban implemented

Enforcement would be designed to be low key – focussing on blatant violations. It could be implemented through the contractors, who will not pick up garbage containing recyclables, as with the current yard waste ban. Alternatively, a system of random inspections by SPU staff could be implemented. Enforcement

procedures will be established, and a visual threshold of unacceptable amounts of recycling in the garbage decided on. Citizens will not be penalized for trivial violations.

The Executive will submit an ordinance by the fourth quarter of 2004 to establish this requirement.

The annual tonnage diverted from the landfill in 2008 is projected to be 36,000 tons, and would increase the citywide recycling rate by 4.3% . The annual tonnage diverted from the landfill in 2010 is projected to be 36,300 tons, and would increase the citywide recycling rate by 4.3%. This program is expected to divert most of the remaining recyclables from the residential garbage. In 2001 residents recycled nearly 136,000 tons. The net ***savings*** *of this program to SPU are $16/ton averaged over 20 years. Other cost and tonnage data are in Appendix 3. Cost and tonnage data are planning estimates and therefore subject to a range of uncertainty.*

Self-haul

At present, recycling at the transfer stations is very constrained by inadequate space. There is considerable potential for additional recycling, especially more construction debris such as wood, metal and gypsum scrap. There is also a sizeable quantity of reusable items in the self-haul waste that could be diverted. The key barrier is lack of sufficient space. In 2001 SPU was unsuccessful in its bid for the King County property next to the South Transfer Station. The current Facilities Plan is evaluating other opportunities for expansion of our overall operations, which would free up space at one or both our existing transfer stations for optimizing diversion.

A conceptual design for a prototype waste reduction/recycling center for self-haul customers was prepared for SPU in 2001. The prototype also assessed the optimum operation for such a facility, and the most cost-effective way to separate and handle in-coming loads. Tonnage assumptions were based on most self-haulers using the recycling center, and some continuing to use one of the existing transfer stations. The Facilities Plan will include more specific options for increasing self-haul waste reduction and recycling.

Tonnage assumptions for this program are included in the overall self-haul tonnage diversion projections in Appendix 1. They project that 15,000 tons will be diverted in 2008, which would increase the citywide recycling rate by 1.9%. 39,000 tons will be diverted in 2010, which would increase the citywide recycling rate by 4.7%. This assumes new facilities with new opportunities to recycle construction debris. Costs will be included in the Facilities Plan that will be presented this summer.

SECTION 5 – AGGREGATE TONNAGE AND COSTS

□ Tonnage

If all the proposed programs are fully ramped up, they are estimated to divert nearly 3,200,000 tons over 20 years from 2004 - 2024 (135,000 tons/year in 2008 and 167,000 tons/year in 2010). This would represent an increase in the City's overall recycling rate by 16.3 percentage points by 2008 and over 20 percentage points by 2010.. If we take the 2001 recycling rate of 37.9% as a baseline, the proposed programs will increase the City's recycling rate to 54.2 % in 2008 and to just over 58% in 2010[7]. While this is still somewhat short of our 60% goal, it represents a tremendous jump in recycling – as much as the increase following the introduction of municipal programs in the late 1980's. Recycling between 1988 and 1995 rose from 25% to 44%.

It is important to note that the program totals are projections – the actual performance rate may turn out to be different. Certainly the success of residential curbside recycling has outstripped the original planning projections. For this reason we are not prepared to adjust the target date, and certainly not the overall goal, despite these planning projections. However, we are recommending that the City continue to track program performance and the overall recycling rate. We further recommend a formal "mid-point assessment" in 2006 (based on 2005 data). This will allow the City to assess technological and market changes, and performance levels. If program performance is still trending short of the 60% goal, there will still be time to consider the modification of adopted programs as well as possible additional programs to meet the 60% goal. Slight modification of the target date may have to be considered at some point, but our strong recommendation is that the 60% goal itself be held constant.

□ Costs

Projected cost and tonnage data are shown in Appendix 1, and further details for each program in Appendices 2 and 3. While the levelized cost of each program has been presented individually, it is appropriate to consider the cost of the entire set of programs as a package. Our planning calculations show the overall cost of implementing these new programs to be greater than the strict financial costs of continuing to dispose of all of those tons of solid waste as garbage. The net levelized cost to SPU for the entire package (except for self-haul) is $5.40/ton diverted (averaged over 20 years)[8]. However, a few comments are in order here.

[7] Appendix 1 shows the recycling rate calculations. Generation is projected to grow slightly, and recycling from existing programs is assumed to continue. Increases above current rates depend on new programs.
[8] $12.54/ton commercial and -$8.23/ton residential.

First, as has been noted, these are planning level calculations. Real costs, just as real tons, may vary. (This is especially true given how low the projected net cost is.) Second, as an integral part of this proposal, we will be obtaining more accurate information about commercial food waste costs (one of the more expensive components of the package) by an RFP.

Finally and most importantly, these costs are only monetary costs. When waste reduction and recycling is evaluated in the larger context of sustainability, additional benefits to the global environment can be accounted, even if they are not entirely realized at the local level. These benefits include: reduction in greenhouse gas emissions, reduction in overall energy and water use, and conservation of virgin material resources. This proposal acknowledges the value of such long-term environmental benefits.

To put the cost of this overall package in perspective – the levelized $5.40/ton cost times 167,000 new tons recycled in 2010 comes to approximately $900,000, which is less than 1% of the Solid Waste Fund's annual O&M expenditure.

□ Rates

As all of these costs are general planning costs, they are not yet developed to the point of being able to predict their implications for the 2004 solid waste rates. This will be done in our 2004 rate study and submitted to City Council later this year.

SECTION 6 – ALTERNATIVES TO PROPOSAL

- **Maximum Recycling**

In order to maximize currently feasible recycling, two additional programs could be added: residential food waste collection and the addition of textiles to the curbside program.

Residential food waste would most efficiently be collected with yard waste. However, there are still concerns about every other week collection of food waste. Furthermore, the program is projected to be expensive. The Executive felt that this program was going too far too fast, and that it would be better to await our own experience with commercial food waste, and the experiences of some of the suburban cities with food waste collection before taking the plunge.

Residential food waste collection would add 1.4% to the overall recycling rate – nearly 12,000 tons/year. The tonnage assumes participation rates based on SPU pilot projects. It is projected to cost over $2,000,000/year, for a net cost of $182/ton averaged over 20 years. This is a very expensive program compared to the programs proposed in this package.

Adding textiles to curbside recycling would have minimal effect on the overall recycling rate – fewer than 1,000 tons/year, and would cost an estimated $35,000/year, or $42/ton averaged over 20 years. This is relatively expensive for a 0.1% increase in recycling.

Since this program was initially considered, we have noticed that drop boxes for textiles have been placed in many neighborhoods, which is a good alternative to curbside collection. Also, several charitable organizations depend on used clothing and other textile items, and there is concern that a curbside program would divert too many reusables.

Under a maximum scenario, Public Place Recycling could be considerably increased to include 1100 locations in parks and on street sides. It is estimated that this level of effort would divert nearly 300 tons/year for a cost of almost $650,000/year.

The main purpose of public place recycling is to reinforce the recycling message. A more expansive program would broaden the message, but there are other ways to spend this amount of money that could be even more effective.

A maximum effort could also include an increase in spending on waste reduction by delivering the programs described above more aggressively. However, our present projections for 2 percentage points of diversion from waste reduction are

very tentative in and of themselves, due to the difficulty of measuring gains from waste reduction. We believe it would be difficult to project with any confidence any larger returns from waste reduction even at considerably higher investment levels.

- **No cost increase**

Current waste reduction and recycling programs include curbside collection for residents, and for small businesses. The Business and Industry Recycling Venture offers education and assistance to businesses about waste reduction and recycling. The sustainable building program also provides assistance for construction activities, and we offer green purchasing advice to businesses.

SPU provides outreach and education about on-site organics management for residents and landscape professionals. Product stewardship efforts are well underway, and on-going education is included in *Curb Waste and Conserve* and *At Your Service.*

The only program for increasing recycling without additional costs is the commercial yard waste ban, which can be implemented with minimum staff time and outreach.

The commercial and residential bans are cost saving after the first few years, but their success depends on a significant amount of educational outreach, in order to minimize customer annoyance and enforcement actions, and to maximize the amount of true diversion. This would require a cost increase up front, as shown in the table in Appendix 1.

It would be possible to implement the commercial paper ban, and dedicate BIRV staff time to providing the up front education and support. However, other programs such as some of the sustainable building outreach and on-going assistance would suffer.

If we assume that the commercial paper ban is implemented without enforcement, and that some current BIRV activities are diverted to up-front education, a rough guess would be that 20% -30% of the total projected tonnage would be diverted.

If we assume that the residential ban is implemented without enforcement, and that current outreach efforts are used to get the message across, a rough guess would be that 10% - 30% of the total projected tonnage would be diverted.

If we assume implementation of the commercial yard waste ban, plus the residential and commercial recyclables bans at the levels described above, the three programs would increase the overall recycling rate by 2%-3% above the present 38%.

Sustaining our Commitment **Cost and Tonnage Data** The tonnage projections in this table are slightly different from the tonnages shown in the body of the text and in Table 4-1 of the Plan Amendment. This is because some programs that were originally projected to start in 2004 are now expected to start in 2005.

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Projected New Tons											
Expand curbside to all businesses	-	1,098	2,200	4,400	4,500	4,600	4,800	4,900	5,000	5,000	5,100
Commercial paper ban	-	7,900	23,300	30,400	30,900	31,700	32,500	33,100	33,500	33,600	34,200
Commercial food waste	1,000	10,000	15,000	25,000	30,200	31,100	31,800	32,300	33,000	33,400	33,900
Commercial YW ban	880	2628	3471	3,493	3,547	3,625	3,707	3,769	3,773	3,782	3,806
Public Place Recycling	80	80	80	80	80	80	80	80	80	80	80
Residential recyclables ban	9,000	18,000	27,000	36,000	36,108	36,216	36,325	36,434	36,543	36,653	36,763
Back yard food waste composting	270	510	720	900	1,050	1,260	1,470	1,680	1,680	1,680	1,680
Waste Reduction	4,010	4,030	8,101	8,141	12,273	16,446	16,528	16,610	16,693	16,775	16,857
Self Haul Recycling (est)	0	0	0	0	15,000	28,000	39,000	39,000	39,000	39,000	39,000
TOTAL NEW TONS	**15,240**	**44,246**	**79,872**	**108,414**	**133,658**	**153,027**	**166,210**	**167,873**	**169,269**	**169,970**	**171,386**
Generation	798,055	802,046	806,056	810,086	814,137	818,207	822,298	826,410	830,542	834,695	838,868
Existing Recycling	303,261	304,777	306,301	307,833	309,372	310,919	312,473	314,036	315,606	317,184	318,770
Total Existing + New Recycling	318,501	349,024	386,173	416,247	443,030	463,946	478,684	481,909	484,875	487,154	490,156
Recycling Rate	**39.9%**	**43.5%**	**47.9%**	**51.4%**	**54.4%**	**56.7%**	**58.2%**	**58.3%**	**58.4%**	**58.4%**	**58.4%**

Projected New SPU Net Costs - not including commercial food waste and self haul recycling

Expand curbside to all businesses	$54,000	$124,626	$125,400	$182,800	$166,500	$170,200	$189,600	$193,300	$185,000	$185,000	$188,700
Commercial paper ban	$200,000	($172,500)	($1,327,500)	($2,010,000)	($2,077,500)	($2,137,500)	($2,197,500)	($2,242,500)	($2,272,500)	($2,280,000)	($2,325,000)
Commercial Food Waste	depends on negotiated price										
Commercial YW ban	($48,121)	($13,753)	($48,430)	($48,813)	($49,753)	($51,111)	($52,539)	($53,618)	($53,688)	($53,845)	($54,262)
Public Place Recycling	$5,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000
Waste Reduction	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,001	$200,002	$200,003	$200,004
Net Commercial SPU Costs	**$410,879**	**$153,373**	**($1,035,530)**	**($1,661,013)**	**($1,745,753)**	**($1,803,411)**	**($1,845,439)**	**($1,887,817)**	**($1,926,186)**	**($1,933,842)**	**($1,975,558)**
Residential recyclables ban	$65,400	($99,200)	($303,800)	($693,400)	($696,575)	($699,760)	($702,954)	($706,158)	($709,372)	($712,595)	($715,827)
Back yard food waste composting	$133,843	$119,482	$106,915	$96,144	$87,168	$74,602	$62,035	$49,469	($90,531)	($90,531)	($90,531)
Waste Reduction	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000
Net Residential SPU Costs	**$399,243**	**$220,282**	**$3,115**	**($397,256)**	**($409,407)**	**($425,158)**	**($440,919)**	**($456,689)**	**($599,903)**	**($603,126)**	**($606,359)**
Total Net SPU Costs	$810,122	$373,654	($1,032,415)	($2,058,269)	($2,155,160)	($2,228,570)	($2,286,358)	($2,344,507)	($2,526,089)	($2,536,967)	($2,581,917)

Appendix **D**

Economic Analysis of New Waste Prevention and Recycling Collection Programs

Economic Analysis of New Waste Prevention and Recycling Collection programs projected to increase Recycling from 40% to 60%

Jeff Morris, Ph.D, Economist, Sound Resource Management Group, and Jenny Bagby Ph.D, Principal Economist, Seattle Public Utilities.

A package of programs designed to reach Seattle's 60% diversion goal has been previously approved and implementation is underway. Below is a summary of the economic analysis presented in "Sustaining our Commitment: Mayor Nickels' Plan to Reaffirm Seattle's Leadership in Recycling".

The analysis included in "Sustaining our Commitment" is the type of cost/benefit analysis that has typically been performed for recycling programs since 1988. This includes the following steps.

1. Detailed program costs - both capital and O&M, over the life of the program – are determined. These include direct costs to SPU such as labor to deliver programs, costs of public education materials, etc. as well as payments to contractors to implement the recycling programs.

2. Program benefits are identified based on the "avoided costs" of diverting a ton of material from garbage to recycling, or of not producing garbage or recycling at all (prevention). We have calculated the avoided costs as the "variable with tons" portion of the cost of handling the material as garbage (or in the case of a home organics program, the cost of handling as yard waste). These avoided costs include the variable portions of collection, transfer, truck transport and all of the rail haul plus disposal costs.

   The total direct cost of handling a ton of residential garbage is about $140 (collection, transfer, trucking, rail and disposal, but excluding SPU labor and other internal costs). In 2001, the avoided cost (benefit) for each ton of garbage that was diverted from garbage to recycling was about $50 per ton. The avoided cost for each ton of waste prevented is about $10 more.

3. The costs of the programs described in #1 above are then subtracted from the benefits (avoided costs). In the past, programs have been considered "cost-effective" if over a 20-30 year period the NPV (Benefits – Costs) is positive. A 3% discount rate has traditionally been used.

The analysis we have done in the past has not taken into account several items. These include:

1. Any additional costs imposed upon our customers for participating in our recycling programs.

   There are conflicting ideas on the magnitude of this number. For residential customers, one theory is that once the garbage and recycling containers are located in the dwelling, the additional amount of time it takes to "sort" is minimal. The reason is that you typically visit your recycling or garbage can with an item at a time and then you just must make a decision as to which container to put it in. There may be

additional minutes associated with taking two containers out of the house and then to the curb, however, you are moving around the same amount of waste, so again, it could be argued that this amount of time is minimal.

For businesses, there may be additional time associated with setting up recycling programs, training employees, organizing maintenance staff etc.

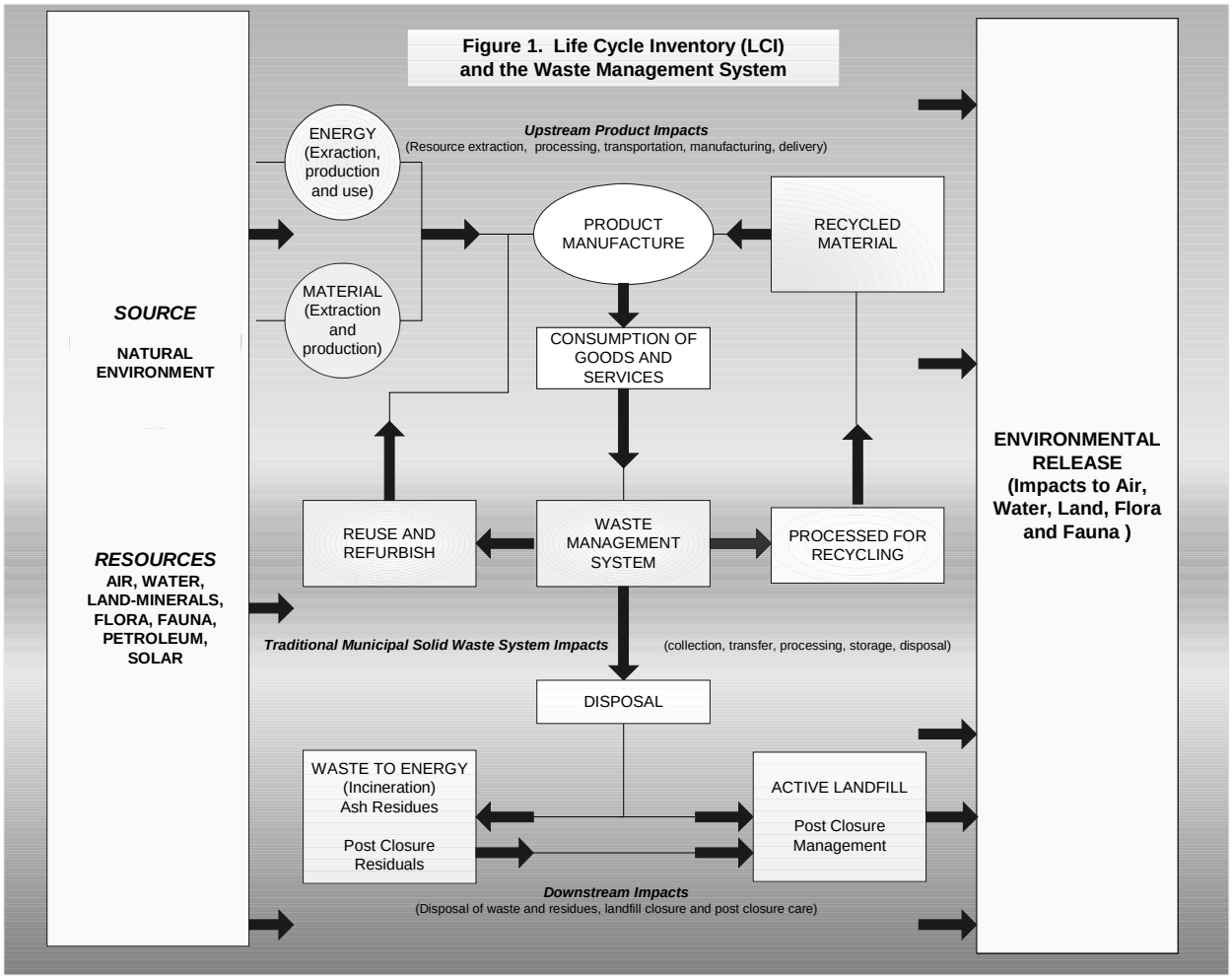
2. External environmental costs and benefits associated with the handling and disposal of waste. Externalities are impacts on the environment that are not "counted" in the price/cost of the activity.

   For example, there are quantifiable benefits associated with manufacturing paper or aluminum cans or tin cans when recycled material is used as a feedstock instead of virgin material. Many of these benefits are associated with the reduced use of energy in the production process and the associated avoided emissions. There are also quantifiable benefits of diverting organics from landfills. Organics that are landfilled 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 15 years. The effort really began with a seminal study done by the Tellus Institute, which attempted to look at both the upstream effects of using recycled material versus virgin material in the production of new products and 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 and has funded the development of a solid waste planning tool that allows you to optimize on either cost, recycling percentage or levels of pollution. SPU is currently installing and assessing the model for our use.

   The graphic below illustrates the material flow and the types of externalities associated with the life cycle of materials.



External Benefits Quantified

The current status of the art of quantifying external environmental benefits allows us to place values on 6 different types of environmental impacts so as to represent some of the upstream savings when material is recycled instead of disposed. The next section describes the various damages we have valued.

Life Cycle Impact Categories: Short Description & Estimates of Impact Cost

The following descriptions of impact categories are from Barbara C. Lippiatt*, Building for Environmental and Economic Sustainability (BEES) Technical Manual and User Guide*, National Institute of Standards and Technology, Technology Administration, U.S. Department of Commerce, October 2002.

1. ***Global Warming Potential:*** This index characterizes the increase in the greenhouse effect due to emissions generated by humankind. Life Cycle Analyses (LCAs) often use a 100-year time horizon to delineate which type emissions of greenhouse gases have a global warming potential. Carbon dioxide (CO2) from burning of 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. Estimates of the dollar cost of a ton of greenhouse gases, measured as CO2 equivalents, range between about $1 per ton CO2, which is a current price for emissions permits traded under voluntary greenhouse gas emission limitation agreements, and $36 per ton, which is Seattle City Light's impact cost estimate used in long range planning. For this evaluation $36 was used.

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 (HCL), and ammonia.

   For purposes of evaluating the economic benefit of recycling in terms of the resulting reductions in releases of acidifying compounds (due to decreased reliance on virgin materials in manufacturing products), we denominated the acidification potential index in tons of sulfur dioxide (SO2) equivalents. One estimate of the impact cost 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 March 2004 spot market auction for emissions permits resulted in a clearing price of $260 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 the soil or water. In both media, the addition of large quantities of mineral nutrients, such as nitrogen and phosphorous, results in generally undesirable shifts in the number of species in ecosystems and a reduction in ecological diversity. In water, it tends to increase algae growth, which can lead to lack of oxygen and therefore death of species such as fish.

   For purposes of evaluating the economic benefit of recycling in terms of the resulting reductions in releases of nutrifying compounds (due to decreased reliance on virgin materials in manufacturing products), we denominated the eutrophication potential index in tons 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. ***Disability-Adjusted Life Year (DALY) Losses:*** Criteria air pollutants are solid and liquid particles commonly found in the air, including coarse particles known to aggravate respiratory conditions such as asthma and fine particles that can lead to more serious respiratory symptoms and disease. In particular, air emissions included in the criteria air pollutants category that cause these human health effects are nitrogen oxides, sulfur oxides, and particulates. Disability-adjusted life years, or DALYs, have been developed to measure health losses from these air pollutants. They account for years of life lost and years lived with disability, adjusted for the severity of the associated unfavorable health conditions.

One of the economic benefits of recycling due to manufacturing products with recycled rather than virgin materials is a reduction in DALY losses. We measured the economic value of that benefit by the Seattle-Tacoma-Bellevue Metropolitan Statistical Area's average wage per job in 2002 of $44,050. (Bureau of Economic Analysis, U.S. Department of Commerce, CA34 Average wage per job for 2002.) Inflating this value to early 2004 yields our value for a DALY of $45,771.

5. ***Human Toxicity Potential:*** EPA in its TRACI software (Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts) developed toxicity equivalency potentials for a number of chemical compounds that measure the relative health concern associated with various chemicals from the perspective of a generic individual in the U.S. (*Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts (TRACI): User's Guide and System Documentation*, EPA-600-R-02-052, August 2002.)

   For purposes of evaluating the economic benefit of recycling in terms of the resulting reductions in releases of compounds toxic to humans (due to decreased reliance on virgin materials in manufacturing products), we denominated the human toxicity potential index in tons of lead (Pb) air emissions equivalents. We used a Minnesota Public Utilities Commission quantification of the externalized environmental costs of criteria air pollutant emissions, in particular lead, associated with electricity generation to measure the human health costs of toxics. The Commission's cost estimates, developed under direction of the Minnesota legislature, were challenged in court, affirmed by the Minnesota Court of Appeals, and Minnesota's Supreme Court in 1998 denied a requested review of the Appeals Court's affirmation. The MN PUC's externalized cost for lead in urban areas was $3,500 per ton in 1995 dollars. Inflating this estimate to early 2004 dollars yields our economic benefit value of $4,293 per ton for reductions in air emissions of lead.

6. ***Ecological Toxicity Potential:*** EPA in its TRACI software also developed toxicity equivalency potentials for a number of chemical compounds that measure the relative potential for chemicals released into the environment to harm terrestrial and aquatic ecosystems.

   For purposes of evaluating the economic benefit of recycling in terms of the resulting reductions in releases of compounds toxic to terrestrial and aquatic ecosystems (due to decreased reliance on virgin materials in manufacturing products), we denominated the ecological toxicity potential index in tons of 2,4-D emissions. We estimated the toxicity cost to plants and wildlife from application of a ton of 2,4-D herbicide at $3,280. This estimate is based on research work by Joe Kovach, Integrated Pest Management Program, Ohio State University. (J. Kovach, *et al*, A Method to Measure the Environmental Impact of Pesticides, available through Online Publications of the New York State Integrated Pest Management Program at http://www.nysipm.cornell.edu/publications/EIQ.html#table2. The cost estimate for 2,4-D shown in this publication was updated based on our recent email communications with Kovach.).

Impact Categories Not Yet Quantified, Material Types Not Yet Evaluated, And Externalized Costs Underestimated

The economic benefits estimated for SPU recycling programs do not include any benefit estimates for recycling of organic materials (other than for reductions in emissions of methane at landfills), wood, construction debris, or non-ferrous metals other than aluminum. At this point the DST database does not have complete life cycle emissions for recycling versus disposal of these materials.

The environmental impact and resource depletion categories developed for TRACI and BEES include the following categories that are at this point not included in our quantification of benefits. This is due mainly to the absence of emissions data for the specific pollutants tracked under many of these categories:

1. Fossil Fuel Depletion Potential
2. Habitat Alteration Potential
3. Smog Formation Potential
4. Ozone depletion Potential
5. Indoor Air Quality
6. Water Intake

Damage cost estimates may underestimate the actual costs to future generations of current releases of pollutants and depletion of resources (including ecosystems, airsheds and watersheds). 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 the 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 releases do not at present appear to adequately account for cumulative and interactive impacts from releases to the environment from usage in industrial processes and commerce of 75,000 to 100,000 chemical compounds. To put this into perspective, our six impact categories quantify releases to air and water for much less than a hundred 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 from recycled- versus virgin-content manufacturing (including the extraction and refining stages) for a number of other substances, but even there the number of substances tracked totals well under 100.

Other Benefits Not Quantified

Existence Value of Recycling: Reduction of waste disposal (and 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.

Triple Bottom Line Net Present Value of new diversion programs identified in "Sustaining our Commitment"

The following table shows the results when the additional environmental benefits are added to the traditional net present value analysis. The differences are significant with most of the savings coming from reductions in greenhouse gas emissions.

Program Name	"Traditional" NPV	Benefits of Reduced Environmental Impacts	Total NPV
Expand curbside to all businesses	($2,265,917)	$6,160,216	$3,894,299
Commercial paper ban	$10,682,682	$49,806,057	$60,488,739
Commercial food waste	($38,591,765)	Not Available	-
Commercial YW ban	$597,658	Not Available	-
Public Place recycling	($2,746,260)	$346,387	$2,399,873
Residential recyclables ban	$5,687,015	$52,656,798	$58,343,813
Back yard food waste composting	($324,216)	Not Available	-
Waste Reduction	$6,262,276	$15,624,898	$21,887,174

For purposes of this analysis, green house gas reduction has been valued at the current damage value that City Light uses for their planning.

The two charts which follow illustrate the magnitude of the additional benefits for two programs, the commercial paper ban (which is cost effective using the traditional analysis) and the expanded curbside program (which is not cost effective using the traditional analysis). The largest factor contributing to the environmental benefits is the reduced damages from greenhouse gas emissions.

Chart 1

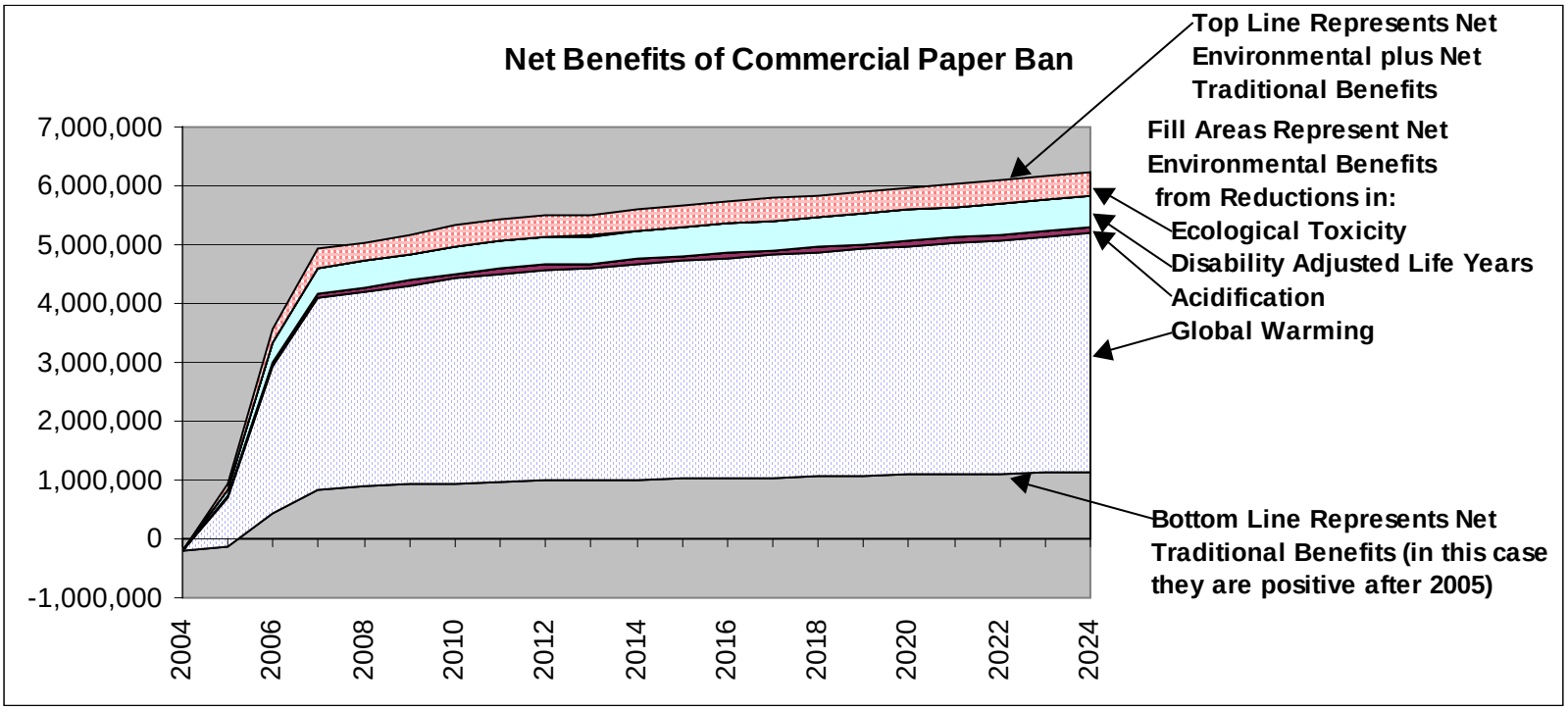
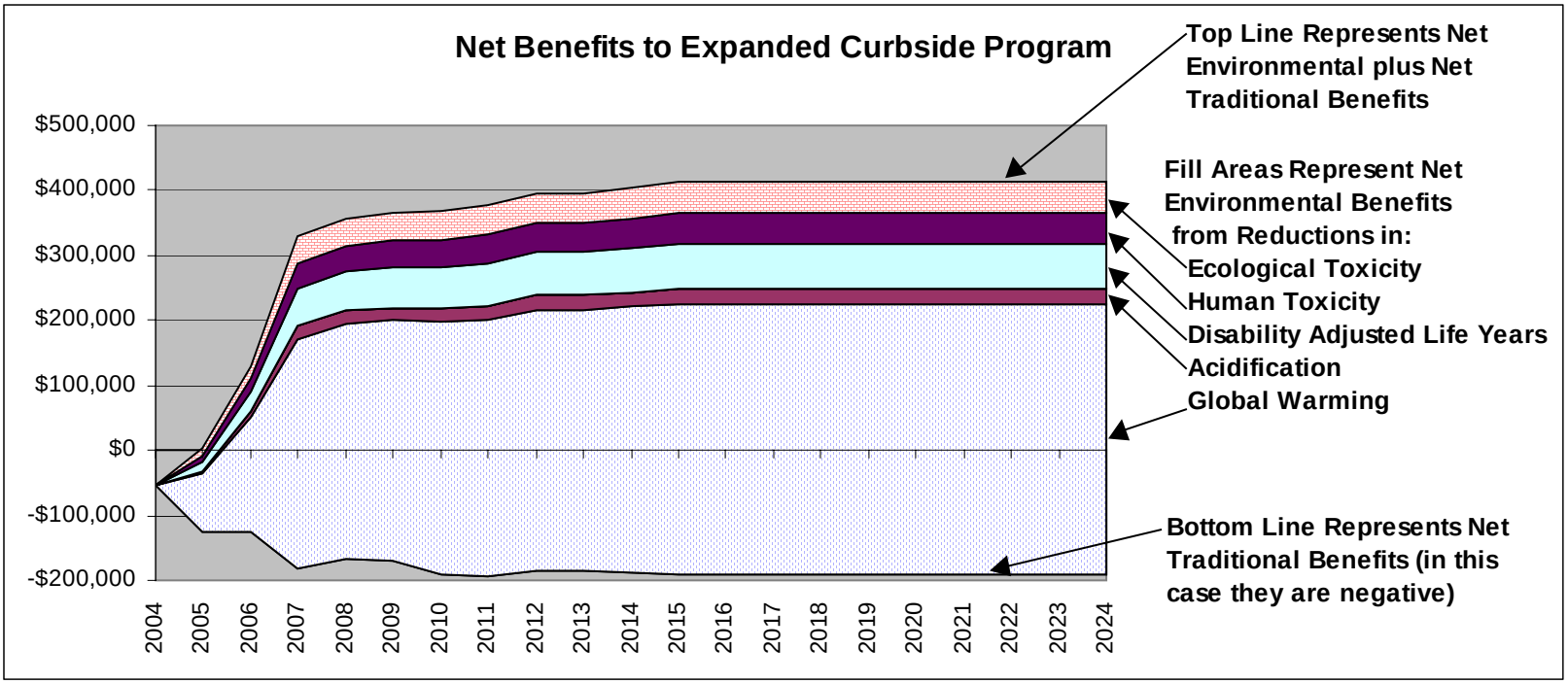


Chart 2



Appendix **E**

SEPA Compliance Memo

Seattle Public Utilities

Memorandum

Date: September 30, 2004

To: Solid Waste Management Plan Amendment
Project File

cc: Joy Keniston-Longrie, Responsible Official
Shanti Colwell, SEPA Administrative Coordinator (for SEPA File)

From: Chris Luboff
Solid Waste Planning Supervisor

Re: SEPA Compliance
2004 Solid Waste Management Plan Amendment

In 1998 Seattle adopted a Solid Waste Management Plan: "On the Path to Sustainability". This Plan (or 1998 Plan) was subject to environmental review, which resulted in the 1998 Programmatic Environmental Impact Statement (1998 EIS).

State regulations require that Plans be reviewed every five years, and then revised or amended as appropriate. SPU reviewed the 1998 Plan in conjunction with its current and anticipated solid waste services and determined that its current solid waste goals and program direction are the same as they were in 1998. Such consistency supports the preparation of a Plan Amendment rather than a Plan Revision.

The 2004 Solid Waste Management Plan Amendment (2004 Plan Amendment) includes actions which represent further steps in implementing the 1998 Plan, rather than new program efforts. Most of these actions were covered in the 1998 EIS. This memo summarizes proposed actions in the 2004 Plan Amendment, and how they are addressed by the 1998 EIS.

Waste Prevention

2004 Plan Amendment

The 2004 Plan Amendment proposes continuation of current programs but with increased emphasis and additional resources. These programs include:

- Natural Lawn and Garden programs – focusing on on-site organics management of food and yard debris, grasscycling, and reducing the use of chemical fertilizers and pesticides,

- Reuse events,
- Continued implementation of the Sustainable Building Action Plan,
- Development of Green Purchasing specifications for City purchasing,
- Product stewardship outreach, legislation and program support,
- General waste reduction promotion, education, and technical assistance for residents and businesses.

The 2004 Plan Amendment also identifies expanding back yard food waste composting efforts and increasing resources to support other waste prevention programs.

SEPA Compliance

All of these programs were addressed in the 1998 EIS (pages 1-5 and 1-16). Neighborhood reuse events were covered in the recycling section of the 1998 EIS under the heading "Home Clean-up drop sites" (page 1-21).

Solid Waste Collection, Processing and Disposal

2004 Plan Amendment

Continuation of current contracts for:

- residential recyclables, yard debris and garbage
- commercial garbage,
- yard debris and recyclables processing,
- rail haul and landfill garbage disposal.

The 2004 Plan Amendment also documents implementation of new programs designed to help the City reach its 60% recycling goal, and to improve customer service, including:

- Disposal ban on residential recyclables,
- Disposal ban on commercial paper, cardboard and yard debris,
- Collection of food waste from commercial customers,
- Expansion of curbside recycling to all commercial customers,
- Minor expansion of yard debris collection to every other week year round (three additional collections/year),
- Distribution of carts to all residents for yard debris.

The 2004 Plan Amendment also discusses the possibility of residential food scraps collection and composting as an additional recycling program.

SEPA Compliance

All but one of these actions discussed in the 2004 Plan Amendment were included in the 1998 EIS as the proposed action, or as alternatives to the proposed action (respectively, pages 1-22 – 1-28 and pages 1-29 – 1-30).

The 1998 EIS anticipated that commercial food waste collection would be provided by private services, whereas the 2004 Plan Amendment proposes offering this service through City-sponsored contracts in addition to privately provided services. This only changes the mechanism for providing the service and does not change the environmental effects. The 1998 EIS determined that increased truck traffic associated with a weekly residential food waste collection program would have insignificant impacts on street congestion (page 2-17).

Expanding the City's contracts to provide "curbside" recycling to all businesses likewise only changes the mechanism for service delivery by supplementing private service with City-provided service. It does not change expectations about quantities of material to be recycled.

The 1998 EIS did not address yard waste collection every other week year-round. However, this increased frequency only represents 3 additional collections per year. The 1998 EIS also did not address distribution of yard waste containers to yard waste subscribers. Collecting yard waste 3 more times per year and distributing yard waste containers (a one-time event) would not result in significant adverse environmental impacts.

Potential impacts of growth combined with the changing traffic flows to the various public and private transfer and processing facilities associated with implementing the proposed programs were identified in the 1998 EIS, but adverse impacts in general were not expected to be significant (page 2-23)

Facilities Development

2004 Plan Amendment

The 2004 Plan Amendment discusses the preparation of a Solid Waste Facilities Master Plan (SWFMP) to address facility improvements beyond those contemplated in the 1998 EIS.

SEPA Compliance

A separate EIS is currently being prepared to address potential environmental impacts of facility development proposed in the SWFMP. The refinements and programmatic actions described in the 2004 Plan Amendment are independent of the SWFMP and do not require new facilities.

Clean City

2004 Plan Amendment

The 2004 Plan Amendment proposes a status quo service level for litter, graffiti and illegal dumping abatement and the addition of public place recycling in high pedestrian areas, and increased event recycling.

SEPA Compliance

The new programs are not expected to have significant adverse environmental impacts.

Historic Landfills

2004 Plan Amendment

The 2004 Plan Amendment discusses continued management of closed Kent Highlands and Midway landfills in compliance with regulatory agreements. Periodic review of the status of old in-City landfills is required to determine any need for additional work.

SEPA Compliance

Activities at Kent Highlands and Midway are carried out under consent decrees with the Department of Ecology. Any environmental review requirements are carried out within these agreements and are independent of the 2004 Plan Amendment.

Old in-City landfills were not discussed in the 1998 Plan or EIS. If periodic review should indicate the need for further action at one of the old in-City landfills, SEPA review would be initiated at that time.

Conclusion – 2004 Solid Waste Management Plan SEPA Compliance

The combination of ongoing activities, slightly modified or refined programs, and minor additions as described in the 2004 Plan Amendment do not result in any new significant adverse environmental impacts. SEPA Compliance is provided by the 1998 EIS.

Jan Mulder, Environmental Science Associates, has reviewed materials in support of the 2004 Plan Amendment, as well as portions of the 1998 Plan and the 1998 EIS, and concurs that the environmental impacts of the 2004 Plan Amendment are adequately addressed by the 1998 EIS.

Appendix **F**

Plan Adoption Resolution