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RESOLUTION NO. 439

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SHORELINE, WASHINGTON, APPROVING THE 2019 COMPREHENSIVE SOLID WASTE MANAGEMENT PLAN FOR THE KING COUNTY SOLID WASTE SYSTEM

WHEREAS, the purpose of the 2019 Comprehensive Solid Waste Management Plan (2019 Plan) is to plan for solid waste and materials reduction, collection, and handling and management services and programs in the geographic area for which King County has comprehensive planning authority for solid waste management by law or by interlocal agreement, or both; and

WHEREAS, the 2019 Plan was prepared in accordance with RCW 70.95.080, which requires that each county within the state, in cooperation with the various cities located within such county, prepare and periodically update a coordinated, comprehensive solid waste management plan; and

WHEREAS, King County and all cities in King County except the Cities of Seattle and Milton have executed the 2013 Amended and Restated Interlocal Agreement ("the interlocal agreement"), and under the interlocal agreement, King County serves as the planning authority for solid waste; and

WHEREAS, King County worked with the city representatives serving on the Metropolitan Solid Waste Management Advisory Committee to develop the 2019 Plan; and

WHEREAS, the 2019 Plan updates and replaces the 2001 Comprehensive Solid Waste Management Plan approved by Shoreline City Council by Motion on March 25, 2002; and

WHEREAS, on April 17, 2019 the King County Regional Policy Committee, acting as the Metropolitan King County Council Solid Waste Interlocal Forum, recommended adoption of Ordinance 18893 for approval of the 2019 Plan; and

WHEREAS, on April 24, 2019 the Metropolitan King County Council adopted Ordinance 18893, which approved the 2019 Plan; and

WHEREAS, the interlocal agreement sets a 120-day period for cities to take action on the 2019 Plan; and

WHEREAS, the 2019 Plan cannot receive final approval unless cities representing at least 75 percent of the incorporated population of the cities that take action in the 120-day period approve the Plan; and

WHEREAS, the 120-day period runs from receipt by a city of the Plan recommended by the Regional Policy Committee and approved by the Metropolitan King County Council; and

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WHEREAS, after city approval, the 2019 Plan is further subject to final approval by the Washington State Department of Ecology;

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF SHORELINE, WASHINGTON, HEREBY RESOLVES:

Section 1. The 2019 Comprehensive Solid Waste Management Plan, attached hereto as Exhibit A, is hereby approved.

ADOPTED BY THE CITY COUNCIL ON AUGUST 12, 2019.

Will Hall

Mayor Will Hall

ATTEST:

J Simulcik

Jessica Simulcik Smith, City Clerk

King County
Department of
Natural Resources and Parks
Solid Waste Division

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Attachment A Updated April 17, 2019

2019 Comprehensive Solid Waste Management Plan

July 2018

King County
Department of
Natural Resources and Parks
Solid Waste Division

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2019 Comprehensive Solid Waste Management Plan

July 2018
Updated April 17, 2019

Alternate formats available
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Acronyms and Abbreviations, and Common Terms

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Acronyms and Abbreviations

2001 Plan . . . . . 2001 Comprehensive Solid Waste Management Plan
AD . . . . . anaerobic digestion
ADC . . . . . alternative daily cover
AMR . . . . . advanced materials recovery
BEW . . . . . Bio Energy Washington
C&D . . . . . construction and demolition debris
CERP . . . . . Capital Equipment Recovery Program
dBA . . . . . decibel
DNRP . . . . . Department of Natural Resources and Parks
Ecology . . . . . Washington State Department of Ecology
EIS . . . . . environmental impact statement
EECBG . . . . . Energy Efficiency and Conservation Block Grant Program
EPS . . . . . expanded polystyrene
FEMA . . . . . Federal Emergency Management Agency
GHG . . . . . greenhouse gas
HDPE . . . . . high-density polyethylene plastic
HHW . . . . . household hazardous waste
ILA . . . . . interlocal agreement
ITSG . . . . . Interjurisdictional Technical Staff Group
KCC . . . . . King County Code
KCSWD . . . . . King County Solid Waste Division
LDPE . . . . . low-density polyethylene plastic
LEED® . . . . . Leadership in Energy and Environmental Design™
LHWMP . . . . . Local Hazardous Waste Management Program
LRF . . . . . Landfill Reserve Fund
MFS . . . . . Minimum Functional Standards for Solid Waste Handling
MRF . . . . . materials recovery facility
MSWMAC . . . . . Metropolitan Solid Waste Management Advisory Committee
MTCO2e . . . . . metric tons of carbon dioxide equivalent
MW . . . . . megawatt
NWPSC . . . . . Northwest Product Stewardship Council
PET . . . . . polyethylene terephthalate plastic
PSCAA . . . . . Puget Sound Clean Air Agency
PSRC . . . . . Puget Sound Regional Council
Public Health . . . . . Public Health – Seattle & King County
PVC . . . . . polyvinyl chloride plastic
RAS . . . . . recycled asphalt shingles
RCW . . . . . Revised Code of Washington
SAC . . . . . Siting Advisory Committee
SEPA . . . . . State Environmental Policy Act

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Site Development Plan . . . Cedar Hills Regional Landfill Site Development Plan
SWAC . . . . . Solid Waste Advisory Committee
SWIF. . . . . Solid Waste Interlocal Forum
Transfer Plan . . . . . Solid Waste Transfer and Waste Management Plan
UASI. . . . . Urban Area Security Initiative
UTC . . . . . Washington Utilities and Transportation Commission
WAC. . . . . Washington Administrative Code
WPR. . . . . waste prevention and recycling

Common Terms

alternative daily cover – cover material other than earthen material which is placed on the surface of the active face of a municipal solid waste landfill at the end of each operating day to control vectors, fires, odors, blowing litter, and scavenging.

advanced materials recovery – uses manual methods and advanced technology to separate all usable, recyclable, and compostable material from the waste stream and ensure that these valuable materials are available for use and not sent to the landfill.

basic fee – the per-ton fee charged to customers disposing of municipal solid waste at transfer facilities.

biochar – charcoal produced from plant matter and stored in the soil as a means of removing carbon dioxide from the atmosphere.

biosolids – refers to treated sewage sludge that meets the Environmental Protection Agency pollutant and pathogen requirements for land application and surface disposal.

clean wood – unpainted and untreated wood, including pallets and wood from construction and demolition projects.

commercial collection company (hauler) – a private-sector company that collects garbage, recyclables, and organics from residents and businesses.

compost – the product resulting from the controlled biological decomposition of organic waste, including yard waste, food scraps, and food-soiled paper, which is beneficial to plant growth when used as a soil amendment.

construction and demolition debris (C&D) – recyclable and non-recyclable materials that result from construction, remodeling, repair or demolition of buildings, roads or other structures, and requires removal from the site of construction or demolition. Construction and demolition debris does not include land clearing materials such as soil, rock, and vegetation.

climate change – changes in the long-term trends in average weather patterns of a region, including the frequency, duration, and intensity of wind and snow storms, cold weather and heat waves, drought, and flooding; climate change is attributed primarily to the emission of greenhouse gases, including such compounds as carbon dioxide and methane.

debris management site – temporary site where debris can be taken after a major emergency, such as flood, windstorm, or earthquake, until it can be sorted for recycling or proper disposal.

diversion – any legal practice or program that diverts solid waste from disposal in the landfill.

drop box – scaled-down transfer facility, designed to provide cost-effective convenient drop-off services for garbage and recycling primarily for self-haulers in the rural areas of the county.

equity – when all people have an equal opportunity to attain their full potential. Inequity occurs when there are differences in well-being between and within communities that are systematic, patterned, unfair, and can be changed; they are not random, as they are caused by our past and current decisions, systems of power and privilege, policies, and the implementation of those policies.

G-certificate – a permit granting commercial solid waste hauling companies authority to operate in a specific area. The permit is issued by the Washington Utilities and Transportation Commission.

green building – the practice of creating and using healthier and more resource-efficient methods of construction, renovation, operation, maintenance, and demolition of buildings and other structures.

greenhouse gas – any gas that contributes to the "greenhouse effect" such as carbon dioxide, methane, nitrous-oxide, chlorofluorocarbons, chlorodifluoromethane, perfluoroethane, and sulfur hexafluoride.

host city – a city that has a county transfer facility within its incorporated boundaries.

industrial waste stabilizer – material which is mixed with industrial ash to structurally stabilize the ash. King County designates the use of construction and demolition debris residuals for industrial waste stabilizer at disposal.

interlocal agreement – an agreement between a city and the county for participation in the King County solid waste system.

landfill gas – gas generated through the decomposition of waste buried in the landfill, which consists of about 50 to 60 percent methane and about 40 to 50 percent carbon dioxide, with less than 1 percent oxygen, nitrogen, and other trace gases.

leachate – water that percolates through garbage at the landfill and requires collection and treatment before being sent to a wastewater treatment plant.

Leadership in Energy and Environmental Design™ (LEED®) – a recognized standard for measuring building sustainability; the rating system evaluates buildings in six areas: sustainable site development, water savings, energy efficiency, materials and resources selection, indoor environmental quality, and innovation and design.

materials recovery facility – uses manual methods and advanced technology to separate collected recyclable materials.

municipal solid waste or MSW – includes garbage (putrescible wastes) and rubbish (nonputrescible wastes), except recyclables that have been source-separated; the residual from source-separated recyclables is MSW.

non-residential generator – businesses, institutions, and government entities that generate solid waste.

organics – yard waste, food scraps, and food-soiled paper.

product stewardship or producer responsibility – an environmental management strategy whereby manufacturers take responsibility for minimizing a product's environmental impact throughout all stages of a product's life cycle, including end of life management.

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regional direct fee – a discounted fee charged to commercial collection companies that haul solid waste to Cedar Hills from their own transfer stations and processing facilities, thus bypassing county transfer stations.

self-hauler – anyone who brings garbage, recyclables, and/or yard waste to division transfer facilities except a commercial collection company.

social justice – encompasses all aspects of justice, including legal, political, and economic; it demands fair distribution of public goods, institutional resources, and life opportunities.

solid waste – all materials discarded including garbage, recyclables, and organics.

special waste – wastes that have special handling needs or have specific waste properties that require waste clearance before disposal. These wastes include contaminated soil, asbestos-containing materials, wastewater treatment plant grit, industrial wastes, and other wastes.

standard curbside recyclables – glass and plastic containers, tin and aluminum cans, mixed waste paper, newspaper, and cardboard.

sustainability – an approach to growth and development that balances social needs and economic opportunities with the long-term preservation of a clean and healthy natural environment. This approach to action and development integrates environmental quality, social equity, fiscal responsibility, and economic vitality.

tipping fee – a per-ton fee charged to dispose waste at solid waste facilities.

vector – is an organism that does not cause disease itself but which spreads infection by conveying pathogens from one host to another such as a mosquito or rat.

waste conversion technologies – non-incineration technologies that use thermal, chemical, or biological processes, sometimes combined with mechanical processes, to convert the post-recycled or residual portion of the municipal solid waste stream to electricity, fuels, and/or chemicals that can be used by industry.

waste generation – waste disposed plus materials recycled.

waste prevention – the practice of creating less waste, which saves the resources needed to recycle or dispose of it such as choosing to purchase items with less or no packaging.

waste-to-energy technologies – recover energy from municipal solid waste and include both waste conversion technologies and incineration with energy recovery, such as mass burn waste-to-energy, refuse derived fuel, and advanced thermal recycling.

zero waste of resources or zero waste – a planning principle designed to eliminate the disposal of materials with economic value. Zero waste does not mean that no waste will be disposed; it proposes that maximum feasible and cost-effective efforts be made to prevent, reuse, and recycle waste.

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Executive Summary

This Comprehensive Solid Waste Management Plan (Plan) sets strategies for managing solid waste in King County over the next six to 20 years. Required by the Revised Code of Washington (RCW) 70.95, this Plan will guide actions by King County, all cities in King County except Seattle and Milton, and private companies that provide curbside collection and processing of recyclable materials.

This Plan addresses the many public and private components of the regional solid waste system, including:

- The King County Solid Waste Division's (division's) operation of the Cedar Hills regional landfill, ten transfer facilities, nine closed landfills, and many programs to prevent and recycle waste;
- City efforts to promote recycling and provide for curbside pick-up of materials, either as a direct city service or through contracts with private haulers; and
- Private companies' collection of materials at the curbside and operation of processing facilities that convert recyclable and organic materials into marketable products.

Partnerships among system participants are key to the successful implementation of this Plan. In 2018, the final city signed the Amended and Restated Interlocal Agreement, securing participation of all 37 partner cities through 2040. This milestone reaffirms the county's responsibility to provide disposal through 2040, allows costs and risks to be shared across the large regional customer base, and strengthens opportunities to work together to achieve environmental goals.

This Plan benefitted from extensive public input including nearly two years of collaboration between the division and its two advisory committees. The input helped the Plan address time-critical service choices facing the regional system:

Recycling. Waste prevention and recycling are long-standing priorities. Much progress has been made through expanded recycling options and services, customer education, and other means. However the region's recycling percentage still hovers in the low 50s and stronger markets for recyclables are needed in light of factors such as China's recent import restrictions on recyclable materials. This Plan offers a variety of waste prevention and recycling approaches that allow system participants to tailor approaches to their jurisdiction's needs while working together to harmonize approaches to achieve better results for the region.

Transfer. This Plan recommends the continued modernization of the transfer system. Station upgrades are completed or underway in all urban areas (except for Northeast King County) to improve services and meet future needs. This Plan recommends that the 1960s era Houghton station in Kirkland be replaced with a modern station so that equitable levels of service are available throughout the urban area including the fast-growing Northeast part of King County.

Disposal. The Cedar Hills Regional Landfill has provided cost-effective, environmentally responsible waste disposal for more than 50 years. Built capacity at the landfill will be exhausted in 2028 however, leaving only ten years to put the next disposal method in place. To meet disposal needs, this Plan recommends further development of Cedar Hills to maximize disposal capacity, while affirming that garbage shall not be disposed of, nor shall soils be stockpiled, within 1,000 feet of the property line at the landfill, in accordance with the Settlement Agreement. To account for technological advances, this Plan does not specify the next disposal method after ultimate closure of Cedar Hills. Evaluation of future disposal methods will begin before the next plan update.

Although many challenges lie ahead for the regional solid waste system, working together under this Plan, system participants can achieve more through collective effort that continues the region's commitment to customer-oriented environmentally responsible solid waste services.

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1 Introduction

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Introduction

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This *Comprehensive Solid Waste Management Plan* (Plan) proposes strategies for managing King County's solid waste over the next six years, with consideration of the next 20 years. The Plan was prepared by the Solid Waste Division (the division) of the Department of Natural Resources (DNRP) and Parks in accordance with the Revised Code of Washington (RCW) 70.95 and in cooperation with its advisory committees - the Metropolitan Solid Waste Management Advisory Committee (MSWMAC) and the Solid Waste Advisory Committee (SWAC). MSWMAC represents the 37 cities in King County that are signatories to the Amended and Restated Interlocal Agreement (Amended and Restated ILA), the foundation of the King County solid waste system. This Plan revises the 2001 *Comprehensive Solid Waste Management Plan* (2001 Plan), and builds upon the 2006 *Transfer and Waste Management Plan* (Transfer Plan).

With this Plan, the division embraces the DNRP's mission to foster sustainable and livable communities by focusing on these critical areas: environmental quality, equity and social justice, fiscal responsibility, and economic vitality. The division is building upon past and current efforts to increase waste prevention and recycling while advancing green building practices in the region's communities and within its own operations. The division continues to refine operational practices and facility designs in ways that further reduce its carbon footprint and promote the greening of natural and built environments. The participants in the countywide solid waste management system – from the 37 cities within the county's borders to the private-sector collection and processing companies to individual businesses and residents – are contributing to these vital efforts in their own operations and practices.

Since its inception in 1969, the core mission of the division has been to ensure that residents and businesses in the county have access to safe, reliable, efficient, and affordable solid waste handling and disposal services. The last few decades have brought about significant developments in the management of solid waste, stemming not only from advances in technology and the changing marketplace, but from a widespread recognition of the importance of waste prevention, resource conservation, sustainable development and environmental stewardship.

Over time, the management of solid waste has evolved from a relatively simple system of garbage collection and disposal to a much more complex network of collection, transportation, and processing for garbage, recyclables, organics (yard waste and food scraps), and construction and demolition debris. This integrated network combines the infrastructure and services of both the public and private sectors to provide long-term capacity for solid waste management in the region.

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Summary of the Plan Organization

This Plan is organized to guide the reader through the major elements of the solid waste system. Within each chapter are elements as described below:

Goals reflect the long-term outcomes and aspirations for the regional system. Goals should not change through the life of the Plan.

Policies provide broad direction and authorization for services and system priorities. Policies should not change through the life of the Plan.

Actions are targeted, specific, and time-based to implement policies and could include: programs, studies, infrastructure improvements, and regulations. Actions are built on a foundation of daily service delivery by the county, cities, and other stakeholders. This Plan does not attempt to describe every solid waste task in the regional system. It lists only those that are particularly important to initiate or continue. Actions may be updated outside of the formal Plan update process to adapt to changing conditions. The Summary of Recommended Actions table in each chapter includes a page number to indicate where information related to each action can be found in that chapter.

Following the table of contents is a list of acronyms, abbreviations, and common terms used throughout the Plan. A list of the documents referenced in the Plan is provided in Chapter 8. Website addresses are provided for documents that were prepared by or for the division.

Six appendices are provided with the Plan:

- Appendix A is a cost assessment, as required by the Washington Utilities and Transportation Commission (UTC),
- Appendix B includes the six-year capital improvement plan required to be included in the Plan,
- Appendix C is the Amended and Restated Solid Waste Interlocal Agreement (Amended and Restated ILA),
- Appendix D shows assumptions used in the Waste Reduction Model (WARM) model of greenhouse gas emissions,
- Appendix E includes the division's responses to the comments and questions received during the public review period; the full text of each comment is also be available on the division's website,
- Appendix F includes detailed descriptions of the disposal alternatives that were analyzed, and
- Appendix G includes comment letters from Washington state agencies that are required to review the Draft Plan.

Review Process

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State law delegates authority to the county to prepare a comprehensive solid waste management plan in cooperation with the cities within its boundaries. An interlocal agreement is required for any city participating in a joint city-county plan (RCW 70.95.080(3)). This Plan was prepared in cooperation with 37 King County cities with which the county has interlocal agreements (all cities in the county except for Seattle and Milton).

This Plan builds upon the 2001 Plan and the Transfer Plan that was approved by the King County Council in December 2007. This Plan presents goals, policies, and actions in the following areas: the existing solid waste system, forecasting and data, sustainable materials management, the transfer and processing system, landfill management and solid waste disposal, and system financing.

On January 8, 2018, the Draft Plan and Draft Environmental Impact Statement (EIS), conducted according to the State Environmental Policy Act, were released for a 60-day public comment period. The public comment period ended on March 8, 2018. The division received 68 comment letters from 40 individuals, four organizations, five businesses, four agencies, one King County Councilmember and 14 cities. During the comment period, the division also held three open houses and participated in13 stakeholder meetings with varied audiences.

In addition, the division employed a variety of communications tools in the public awareness campaign during the 60-day public review and comment period. These included on-line and in-person opportunities to comment, as well as printed materials, a cable TV spot, press releases, and a PowerPoint presentation to support presentations to stakeholders to make people aware of the key topics in the Draft Plan and how they could comment. Key messages were developed early and were used in all awareness efforts. An on-line tool was also used to offer people a way to voice their opinions on the three key issues in the Draft Plan. A total of 487 respondents (486 in English, one in Spanish) participated in the informal on-line questionnaire (KCSWD 2018a).

The revised Plan, transmitted to the King County Council in July 2018, considers comments, preliminary review by the Washington State Department of Ecology (Ecology), review by the UTC and the Washington State Department of Agriculture, and incorporates the Executive's recommendations. The revised Plan must be adopted by:

- The King County Council,
- The Regional Policy Committee acting as the Solid Waste Interlocal Forum (SWIF), and
- Cities representing three-quarters of the total population of the cities that act on the plan during a 120-day adoption period.

After adoption and completion of the Final EIS the County/City-Approved Plan will be submitted to Ecology. The Plan becomes final upon Ecology's approval.

Following is the anticipated schedule for completion of the Plan review and adoption process:

Approximate dates	Action	Status
January 8 – March 8, 2018	Release Draft Plan and Draft EIS for 60-day public review and comment.	Complete
January 8 – May 7, 2018	Submit Draft Plan and Draft EIS to Ecology and UTC for up to 120-day review and comment.	Complete
May – July 2018	Revise the Draft Plan and Draft EIS to incorporate Ecology, UTC, and public comments and the King County Executive's recommendations. Issue Final EIS.	Complete
July 26, 2018	Submit the revised Plan to the King County Council (including the Regional Policy Committee) for adoption.	Complete
Late 2018/Early 2019	Submit County-approved Plan to the cities for adoption (120-day adoption period).	
Mid 2019	Submit County/City-approved Plan to Ecology for final approval (45 day period).	

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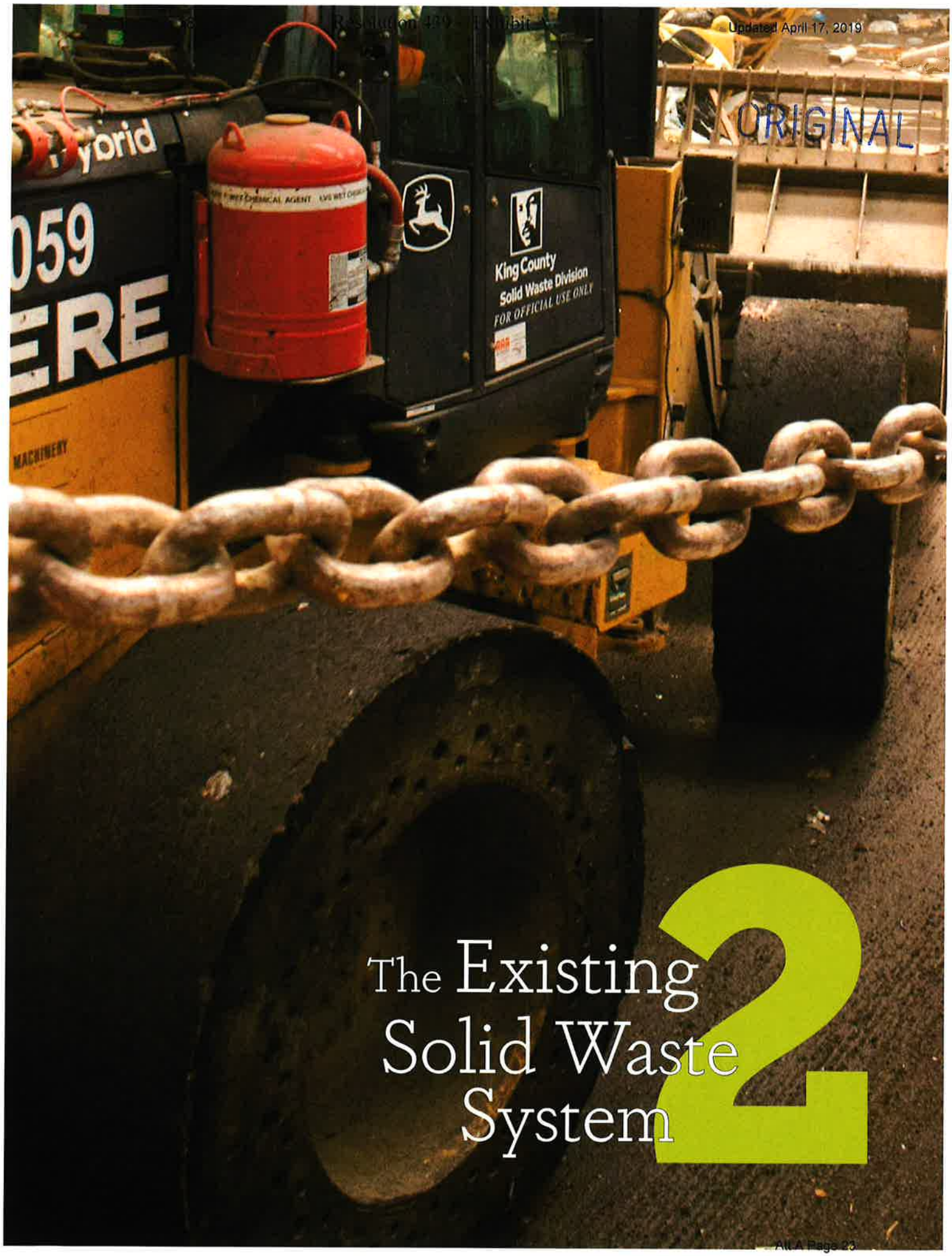

2 The Existing Solid Waste System

Policies

ES-1 Maintain a public and private mix of solid waste transfer and processing facilities.

ES-2 Work with the division's advisory committees, the cities, and the Solid Waste Interlocal Forum on solid waste management planning and decisions.

ES-3 Incorporate principles of equity and social justice into solid waste system planning.

ES-4 Consider climate change impacts and sustainability when planning for facilities, operations, and programs.

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The Existing Solid Waste System

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The solid waste management system has evolved from a relatively basic system of garbage collection and disposal to a much more complex network of collection, sorting, salvage, reuse, recycling, composting, and disposal managed by the county, area cities, and private-sector collection and processing companies. Initial improvements to solid waste facilities and operations have been developed further to incorporate waste prevention and recycling programs that strive to balance resource use and conservation with production and consumption.

Sign at Bow Lake Transfer Station encourages customers to recycle more

One of the early influences in the evolution of the system was the sweeping environmental legislation of the 1960s and 1970s, beginning in 1965 with the federal Solid Waste Management Act, which established strict regulatory standards for landfills and other solid waste facilities. Washington State subsequently passed its own waste management act, codified in Revised Code of Washington (RCW) 70.95, and established Minimum Functional Standards for Solid Waste Handling in the Washington Administrative Code (WAC) 173-304. In 1976, the federal Resource Conservation and Recovery Act set even more stringent standards for environmental protection, including requirements for the use of impermeable bottom liners and daily cover at landfills. In response to the more stringent regulations, the county began closing the unlined community landfills across the region, replacing many of them with the more environmentally protective and geographically dispersed transfer facilities that are still in operation today. With the development of the transfer network (eight transfer stations and two drop boxes) and technological advances at the county-owned Cedar Hills Regional Landfill (Cedar Hills), division facilities and operations were brought into compliance with the new environmental standards, and a safe, efficient, and sustainable system of solid waste management was created. The standards have continued to evolve over time, and transfer facilities and landfills now operate in accordance with the Solid Waste Handling Standards (WAC 173-350) and Criteria for Municipal Solid Waste Landfills (WAC 173-351).

Thirty-seven of the 39 cities in King County (all but the cities of Seattle and Milton) and the unincorporated areas of King County participate in the solid waste system. In all, the county's service area, shown in Figure 2-1, covers approximately 2,050 square miles. In 2017, there were almost 1.5 million residents and about 771,000 people employed in the service area, disposing over 931,000 tons of garbage at Cedar Hills. Studies show that even more can be done to reduce disposal through waste prevention, reuse, and recycling.

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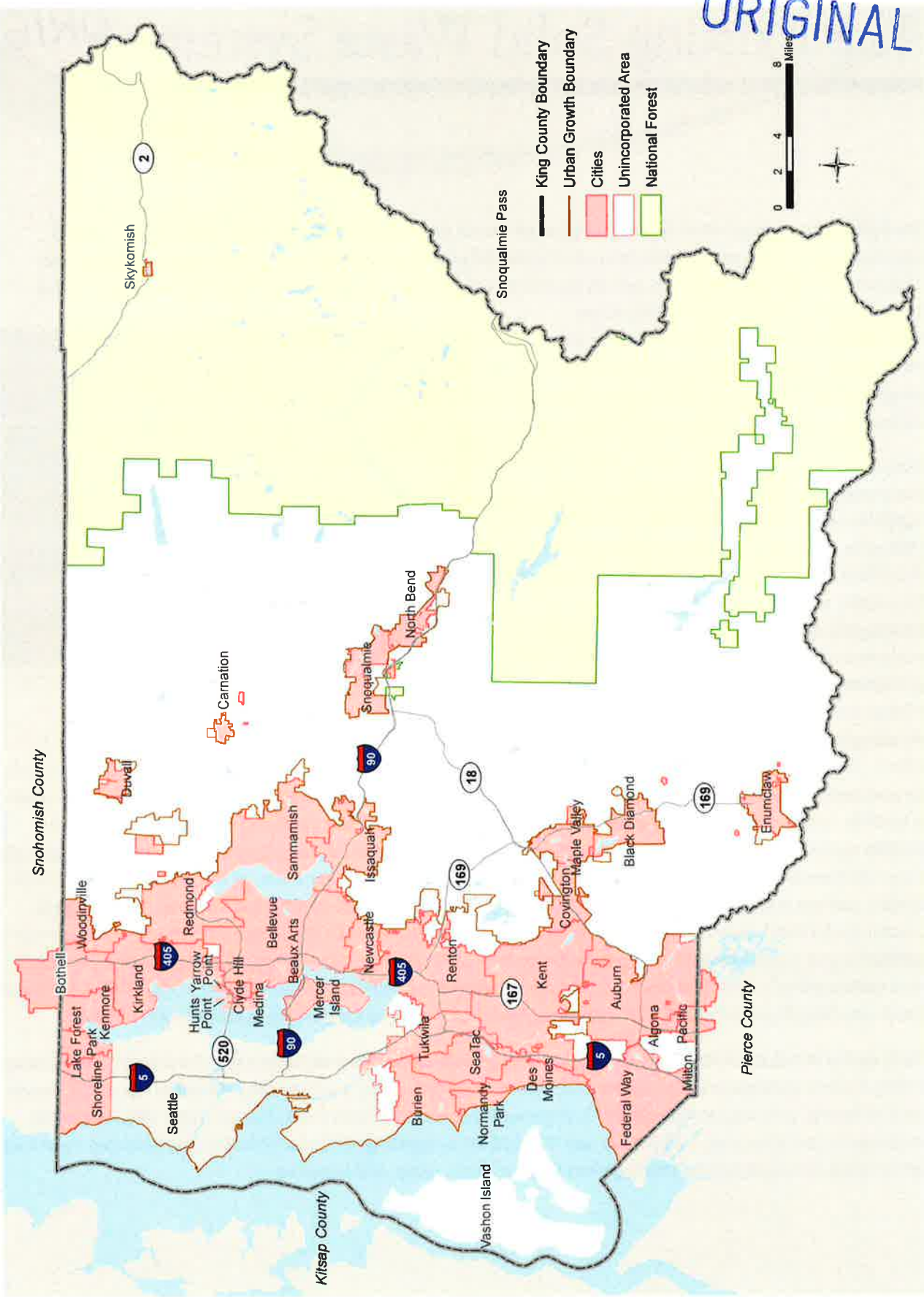
Figure 2-1. King County service area



The Solid Waste System

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Figure 2-2 provides a general overview of the collection, transfer, transportation, processing, and disposal systems for garbage, recyclables, organics, and construction and demolition debris. Garbage is transported to Cedar Hills for disposal, while recyclables, organics, and most construction and demolition materials are taken directly to processing or compost facilities where materials are prepared for sale to manufacturers and other users. As shown, these recycled or composted products eventually return to the market for consumer purchase.

As can be seen in Figure 2-2, this multi-faceted system uses the combined resources of the public and private sectors. Regulations and systems for collection, transfer, transport, processing, and disposal that come into play are complex, involving state, county, city, and private-sector responsibilities.

Collection of Solid Waste and Recyclables

In accordance with state law RCW 81.77.020 and 36.58.040, counties are prohibited from providing curbside garbage collection services. Legal authority for regulating collection is shared primarily between the state – acting through the Washington Utilities and Transportation Commission (UTC) – and the cities. The UTC sets and adjusts rates and requires compliance with the state and local adopted solid waste management plans and related ordinances. RCW 81.77 also includes a process for allowing cities to opt out of the UTC regulatory structure and either contract directly for solid waste collection or provide city-operated collection systems.

Most of the garbage, recyclables, and organics collection is provided by the private sector (Photo courtesy of Recology CleanScapes)

The county's 2001 *Comprehensive Solid Waste Management Plan* (2001 Plan) specifies that recycling should be included as part of the basic garbage rate for residents in most of King County. King County enacted a service-level ordinance (King County Code (KCC) 10.18) that includes this requirement for unincorporated areas, except Vashon Island, Skykomish, and Snoqualmie Pass. The UTC then required collection companies to develop tariffs that spread the cost and availability of recycling to all residential garbage customers. These tariffs and service-level requirements also apply to cities that have not opted out of the UTC regulatory structure.

Most of the garbage, recyclables, and organics collection in the county's service area are provided by four private-sector companies – Recology CleanScapes, Inc., Republic Services, Inc. (formerly Allied Waste, Inc.), Waste Connections, Inc., and Waste Management, Inc. Except for Recology CleanScapes, which only provides contracted services, these companies operate both through the UTC and service contracts with individual cities. Most of the 37 cities in the service area contract directly with one or more of these private companies for collection services. Eight cities (Beaux Arts, Black Diamond, Covington, Hunts Point, Kenmore, Medina, Woodinville, and Yarrow Point) and all of the unincorporated areas receive collection services from these private companies operating under certificates issued by the UTC. Two cities – Enumclaw and Skykomish – provide municipal collection services within their own jurisdictions. Enumclaw collects garbage, recyclables, and organics; Skykomish collects only garbage.

There is a fundamental difference in how the UTC regulates residential and non-residential collection of recyclable materials. The Federal Aviation Administration Authorization Act of 1994 prohibits regulation of price, route, or service

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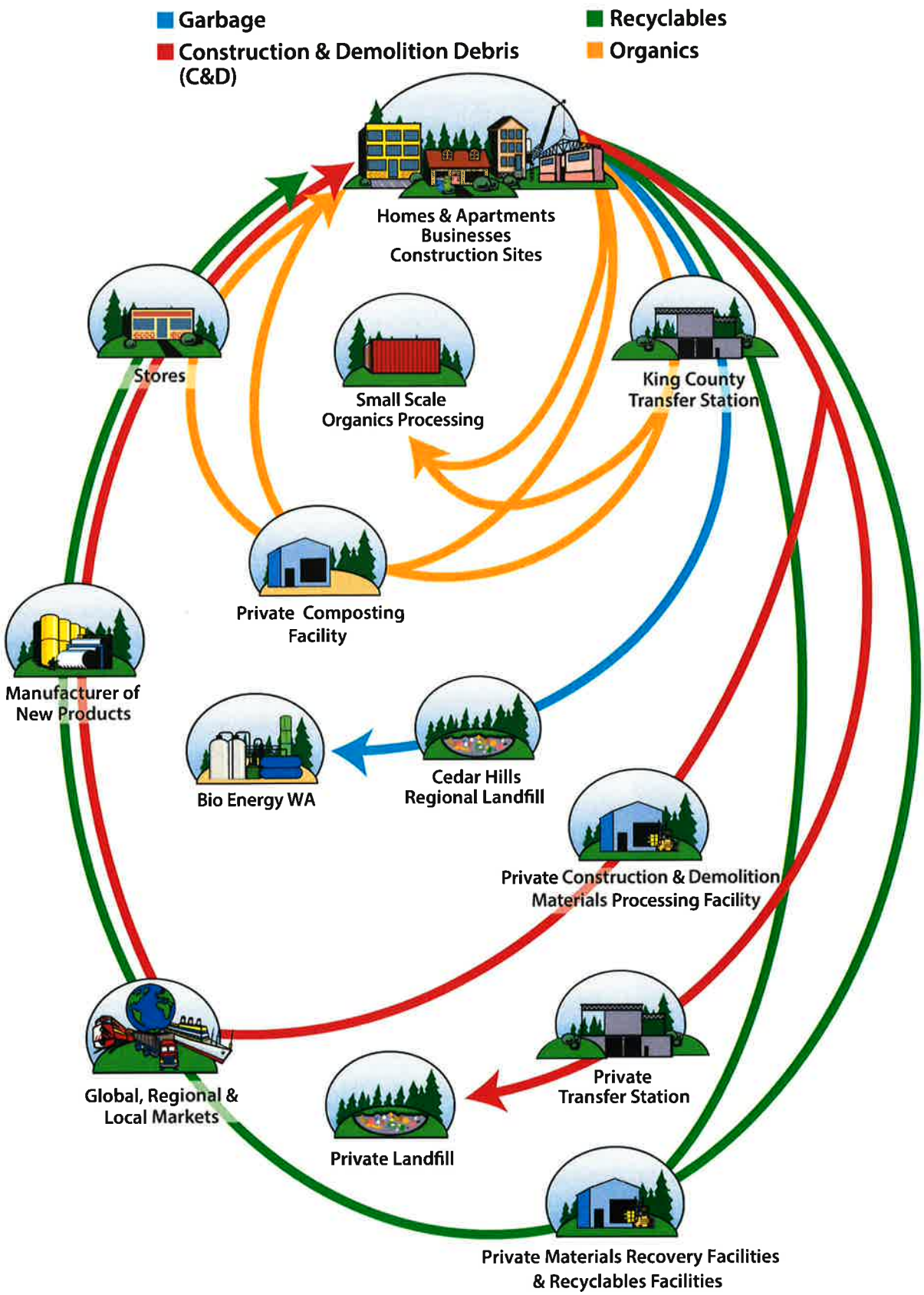
Figure 2-2. The Solid Waste System



of any motor carrier transporting property. While this provision does not apply to collection of garbage and recyclable materials from residents, recyclable materials generated by the non-residential sector are considered to be property and are subject to a different regulatory structure. King County cannot enact ordinances that require commercial garbage collectors to include recyclables collection as part of the non-residential collection service. Cities, on the other hand, may include recyclables collection as part of their non-residential collection service, but cannot prohibit businesses and other non-residential entities from choosing other vendors for this service.

Revenue Sharing Provides Incentive for Collection Companies to Enhance Recycling

In 2010, the state legislature amended statute RCW 81.77.185, allowing solid waste collection companies regulated by the UTC to retain up to 50 percent of the revenue paid to them for the recycled materials they collect from households (the statute does not apply to collection in cities with contracts for recyclables collection). The purpose of the statute is to provide collection companies with a financial incentive to enhance their recycling programs. Formerly, all revenues from the sale of residential recyclables were passed back to the households as a credit on their garbage bills.

To qualify for the revenue sharing, collection companies must submit a plan to the UTC that has been certified by King County as consistent with the current Comprehensive Solid Waste Management Plan. The Solid Waste Division Director has authority to make this certification.

To qualify for certification, the collection company's plan must:

- Be submitted annually for approval,
- Demonstrate how proposed program enhancements will be effective in increasing the quantity and quality of materials collected,
- Demonstrate consistency with the minimum collection standards,
- Incorporate input from the Solid Waste Division, and
- Be submitted to the Solid Waste Division with sufficient time to review prior to UTC deadlines.

Since January 2013, all UTC-regulated areas of King County, except Vashon Island, have certified revenue sharing agreements in place.

Curbside Collection in Rural Areas

When curbside recycling was initiated in King County in the early 1990s, the collection companies (operating under UTC certificates) serving unincorporated areas were required to provide curbside recycling services as specified in KCC 10.18 for most of the county. These requirements, consistent with the 1989 *Comprehensive Solid Waste Management Plan*, stated that curbside recycling would be offered to all households as part of the basic garbage service and that yard waste service would be available to all households as a subscription service. However, some rural areas were exempted from these requirements because their low population density or lack of participation in garbage collection services suggested that curbside recycling might not be cost effective.

Currently, three unincorporated areas are not included in the county's collection service-level standards as specified in KCC 10.18:

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Vashon/Maury Island – Historically, a comparatively high percentage of Vashon/Maury Island residents have chosen to self-haul garbage and recyclables to the division's Vashon Recycling and Transfer Station; however, the number of households subscribing to garbage service has increased over time. Waste Connections, Inc., the company providing garbage collection service on Vashon/Maury Island, also offers subscriptions to recyclables collection services. From a survey of Island residents (KCSWD 2016c), about 17 percent currently subscribe to curbside recycling services. Organics curbside collection is not available.

Skykomish Area – The area around Skykomish is remote and sparsely populated. Residents of Skykomish and some residents in surrounding unincorporated areas receive curbside garbage collection service from the Town of Skykomish. Skykomish does not collect curbside recyclables or organics. Customers may self-haul garbage and recyclables to the division's drop box facility located in Skykomish; however, separate organics collection is not provided at the facility.

Snoqualmie Pass – The Snoqualmie Pass area is also very sparsely populated. Residential garbage collection is available from Waste Management, Inc. of Ellensburg in Kittitas County. Curbside recycling is not available; however; the division does provide a site with collection bins for the standard curbside recyclable materials. Organics collection is not available.

Transfer

The division operates eight transfer stations and two rural drop boxes in the urban and rural areas of the county (Figure 2-3). In addition to meeting standards for the safe and environmentally sound transfer of solid waste, the transfer network reduces the amount of truck traffic on the highways by providing geographically dispersed stations where garbage collected throughout the region can be consolidated into fewer loads for transport to the landfill. Transfer facilities are the public face of the solid waste system. In 2017, county transfer facilities received about 917,650 tons of garbage and recyclables, through more than 952,360 customer visits.

Garbage and, at most facilities, recyclable materials from business and residential self-haulers are accepted at the transfer station and drop box facilities. The transfer stations also provide accessible drop-off locations for garbage picked up at the curb by the commercial collection companies. From these geographically dispersed transfer stations, garbage is consolidated in transfer trailers and taken to the county-owned Cedar Hills Regional Landfill in the Maple Valley area. Recyclable materials are transported to processing facilities throughout the region.

Entrance of Algona Transfer Station

Public Health – Seattle & King County (Public Health) is the primary regulatory and enforcement agency responsible for issuing operating permits for both public and private solid waste handling facilities. This includes solid waste, recycling, and composting facilities. Solid waste

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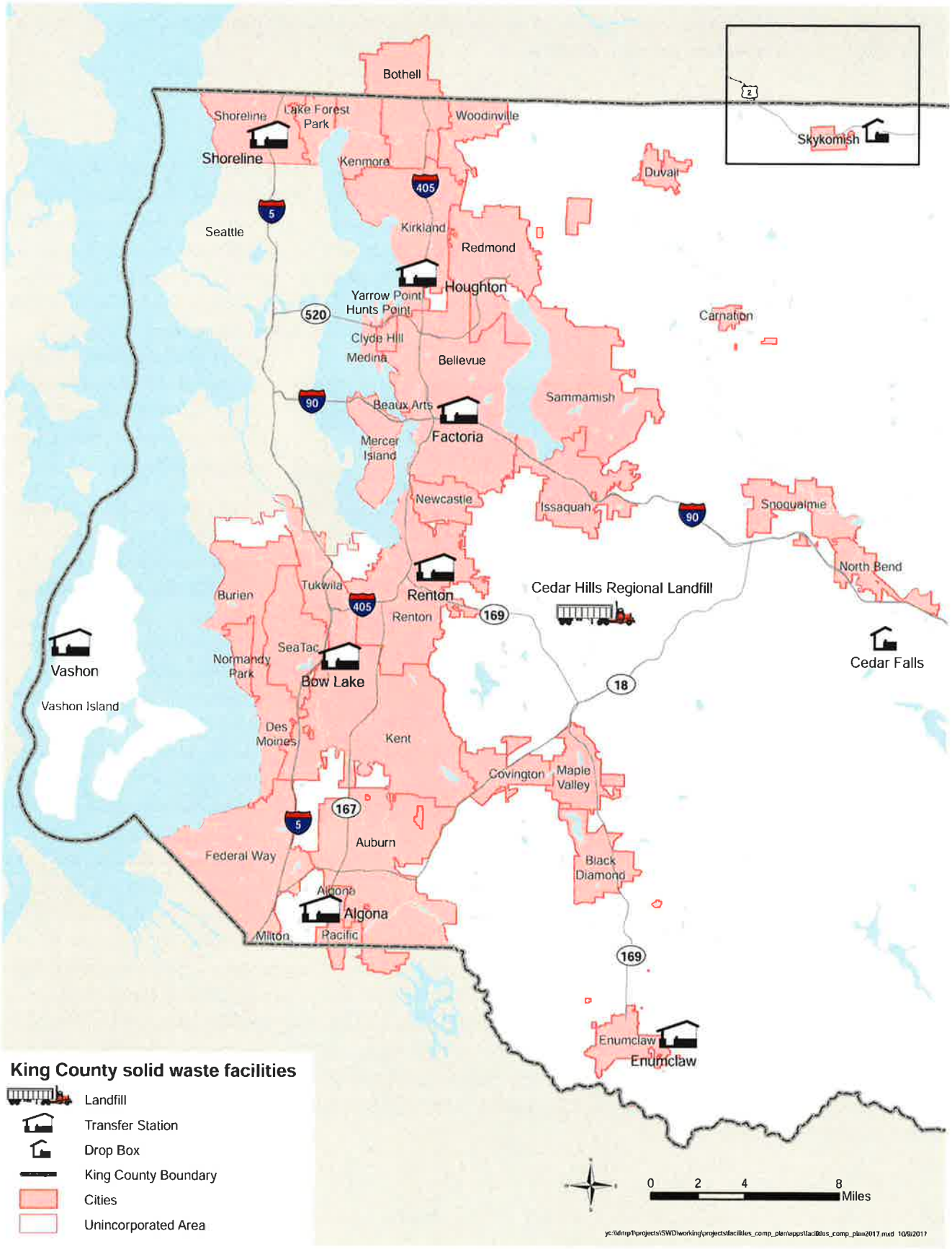
Figure 2-3. Map of transfer station locations



handling regulations are codified in the Code of the King County Board of Health, Title 10. The permitting process is the vehicle by which Public Health enforces the state's Solid Waste Handling Standards (WAC 173-350) and Criteria for Municipal Solid Waste Landfills (WAC 173-351). Public Health inspects solid waste handling facilities and has the authority to take corrective action for noncompliance.

Processing of Commingled Recyclables

While garbage picked up at the curb goes to the county's solid waste system, the collection companies take the recyclable materials picked up at the curb to their own facilities for processing. The processing of recyclable materials into new commodities begins at a materials recovery facility. Materials recovery facilities receive material loads from collection trucks, remove contaminants from the loads, sort materials to meet the specifications of the end users or markets, and compact or bale the material for efficient shipping. As the residential collection system has moved to commingled collection, materials recovery facilities in the region have upgraded their facilities to improve their ability to remove contaminants and sort materials into marketable commodity grades. Any residuals, or non-recyclable waste products, from materials recovery facilities within the King County service area must be disposed of at a King County solid waste facility.

Recology CleanScapes materials recovery facility

The processing of recyclables throughout the Pacific Northwest is currently handled through the private sector. Companies that collect recyclables curbside are required by contract or ordinance to deliver them to recycling facilities. Local facilities receive recyclable materials from the region as well as from other areas of the United States. These private-sector facilities have made necessary upgrades over time to expand processing capacity to meet demand. The three largest collection companies in King County – Recology CleanScapes Inc., Republic Services, Inc., and Waste Management Inc., each own a materials recovery facility located within the county , shown in Figure 2-4, to process most of the recyclable materials they collect. Recology CleanScapes' materials recovery facility in south Seattle opened in 2014. Republic's 3rd and Lander Recycling Center in south Seattle was substantially redesigned in 2007 to improve its ability to sort commingled materials and in 2008 was upgraded to expand capacity. Waste Management's Cascade Recycling Center in Woodinville opened in 2002 and was recently upgraded with a new sort line. Curbside recyclables collected on Vashon Island are processed at Waste Management JMK Fibers' Port of Tacoma facility, which was upgraded substantially in 2013. Table 2-1 shows the address for each facility as well as how many tons were processed in 2017.

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Figure 2-4. Locations of composting, materials recovery, and designated construction and demolition recycling and disposal facilities

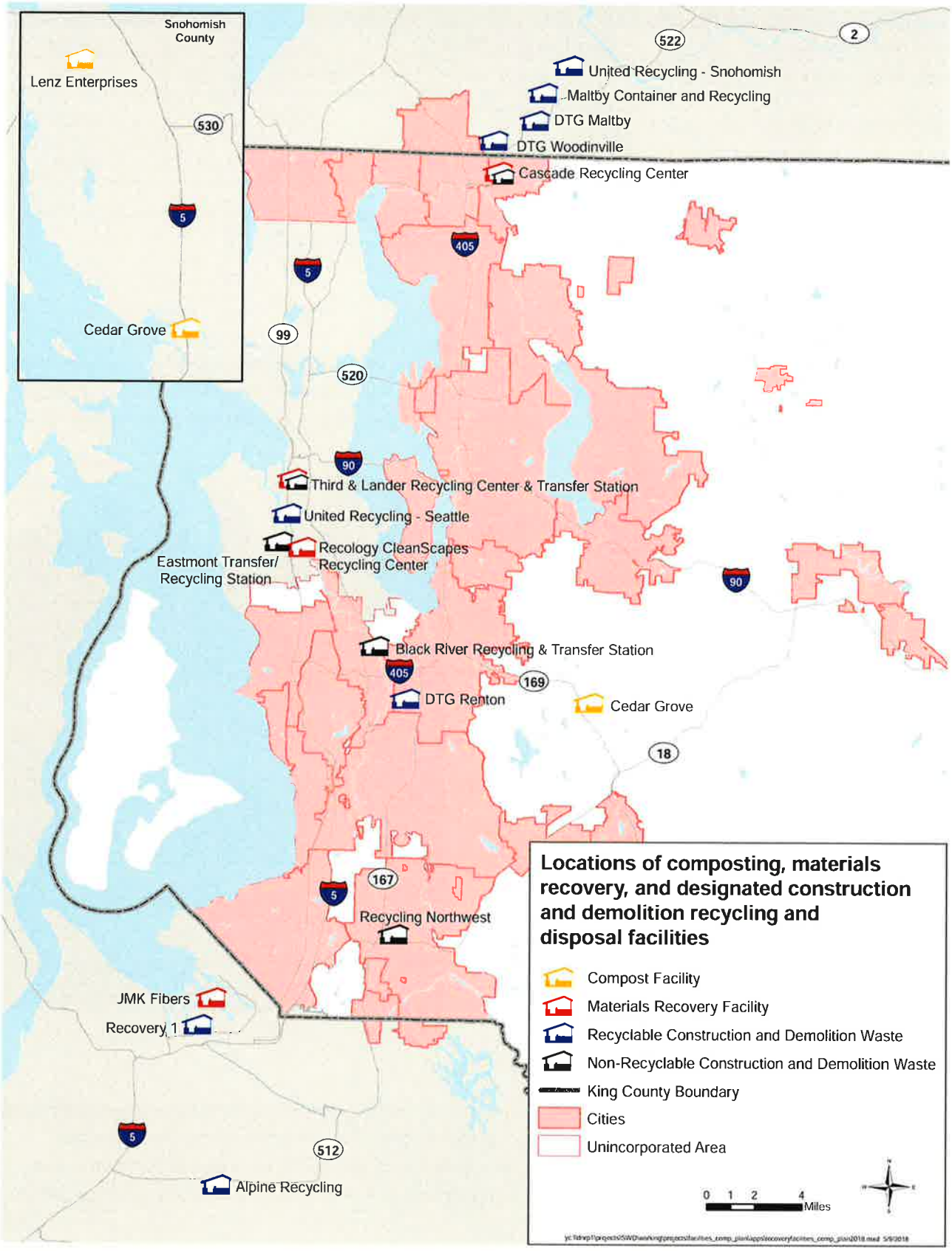

Table 2-1. Materials recovery facilities locations and tons processed in 2017

Materials Recovery Facility	Address	Tons from King County	Total Tons Processed
Recology CleanScapes, Inc.	7303 8th Avenue S., Seattle	73,121	92,038
Republic Services 3rd and Lander Recycling Center	2722 3rd Avenue S., Seattle	Data not broken out by jurisdiction	223,722
Waste Management JMK Fibers	1440 Port of Tacoma Road, Tacoma	55,144	167,394
Waste Management Cascade Recycling Center	14020 NE 190th , Woodinville	64,295	116,234

Facilities that process mixed recyclables in King County are subject to regulation by Public Health under the Code of the King County Board of Health Title 10.12, which adopts the standards of WAC 173-350.

Disposal

Solid waste generated in King County's service area is disposed at the Cedar Hills Regional Landfill – the only active landfill in the county. Located on a 920-acre site in the Maple Valley area, Cedar Hills has provided safe and efficient disposal of the county's solid waste since 1965. In 2017, the landfill received over 931,000 tons of municipal solid waste.

Cedar Hills was originally permitted in 1960, at a time when there were few regulations in place to govern the design and operation of landfills. Since then, environmental regulations have become increasingly rigorous, requiring the placement of an impermeable, high-density polyethylene liner and clay barrier at the bottom of the landfill, daily cover (using soil or other approved materials) over the waste, and frequent environmental monitoring, among other requirements.

A bulldozer compacts waste at the Cedar Hills landfill

Over time, Cedar Hills has been developed in sequential stages (or refuse areas) in accordance with the most current Site Development Plan. The division has invested considerable effort and resources to upgrade older areas of the landfill, while designing and operating new areas to meet or exceed regulatory requirements. Figure 2-5 shows the layout of the landfill, including the boundaries of the past and active refuse areas as currently permitted. As shown, Area 7 is the currently active refuse area, and is expected to operate through 2018 or early 2019. At that time, operations will transition to the newest refuse area, Area 8.

The landfill is bordered to the east by Passage Point, a transitional housing development, residentially zoned property on the east, north, and west, and by property to the south that is zoned for mining, other resource extraction, and similar uses. State regulation WAC 173-351-140(3)(b) requires a 250-foot buffer between the active area and residentially zoned property, and a 100-foot buffer between the active area and non-residentially zoned property.

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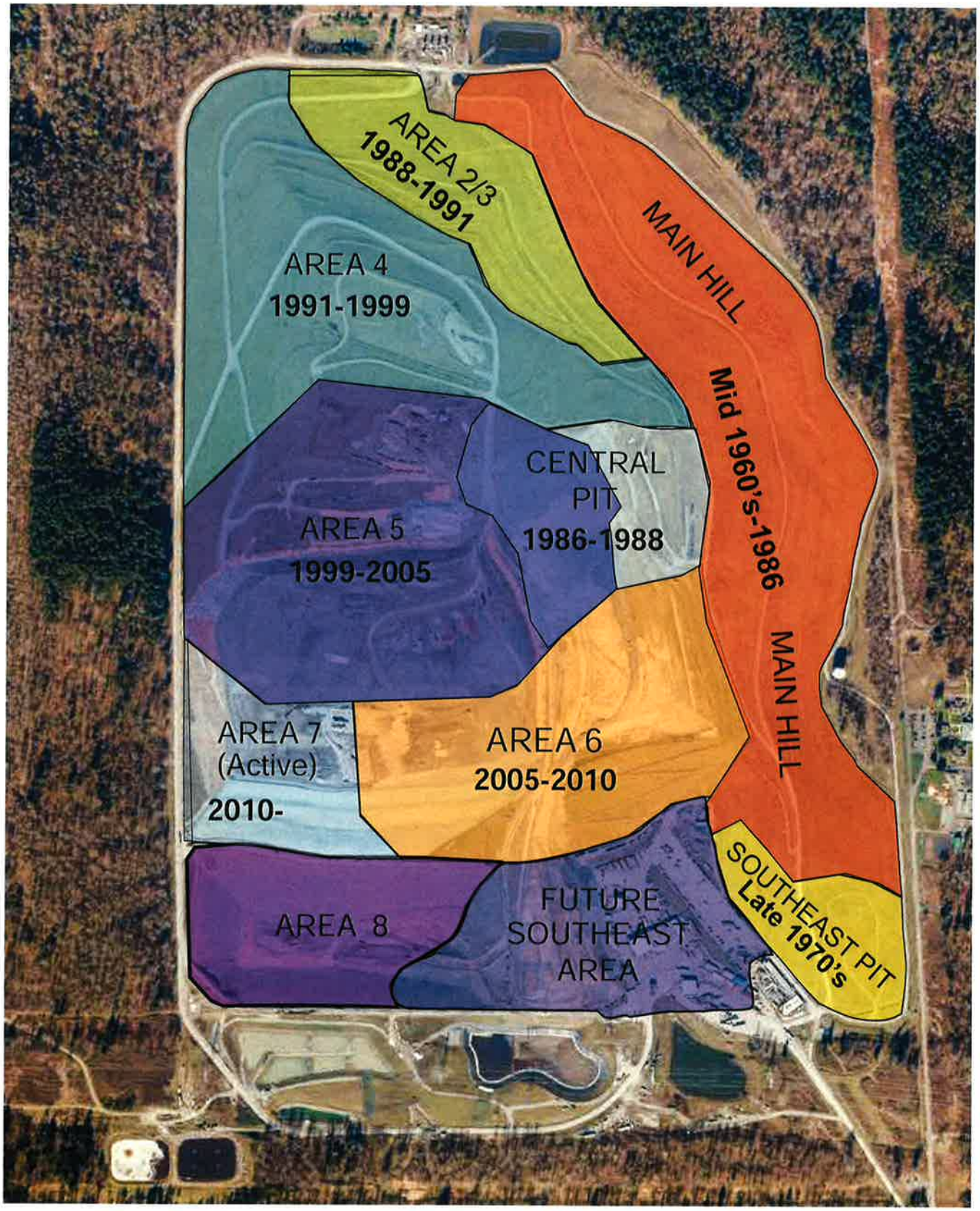
Figure 2-5. Current layout of the Cedar Hills Regional Landfill



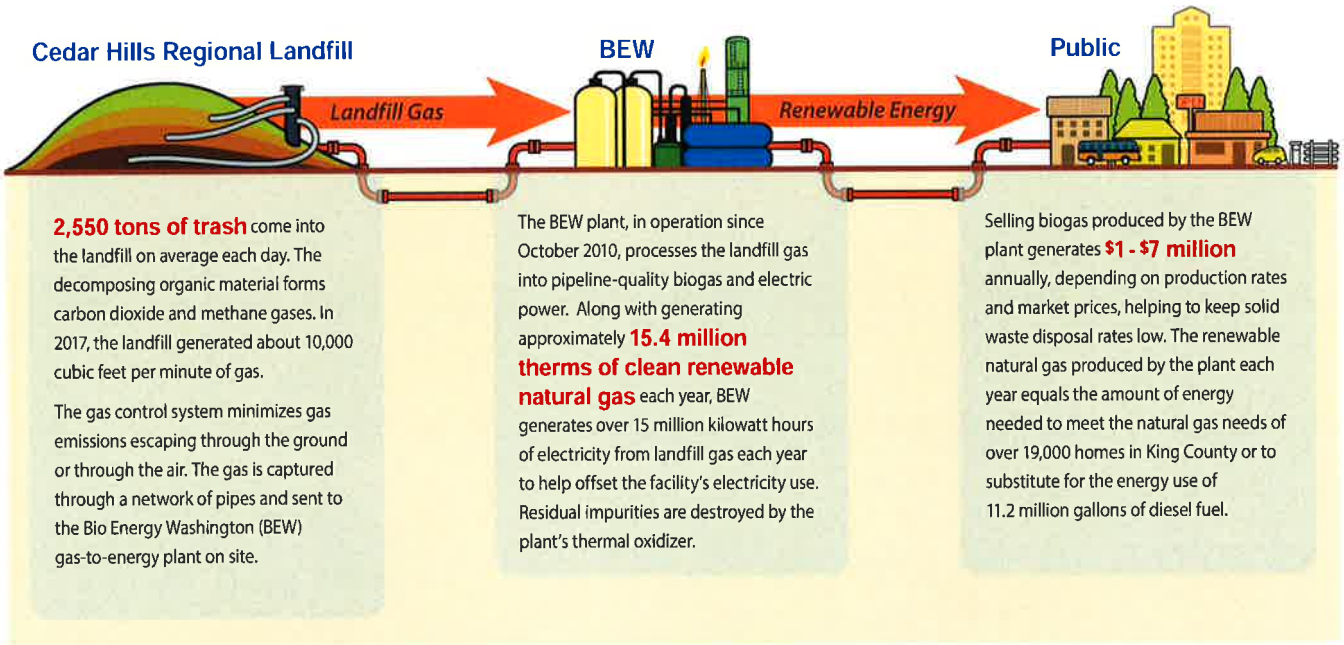
However, a special permit, approved by the King County Board of Commissioners in 1960, specified that a 1,000-foot buffer be established around the landfill. In the 1960s, landfilling inadvertently extended about 400 feet into a portion of the southeast buffer, but environmental regulations continue to be met in that area and opportunities to restore the buffer are being pursued. Active use of this buffer zone is currently limited to site access and other approved uses not directly related to land-filling operations, such as environmental monitoring and activities at Passage Point.

The landfill has received national recognition for its operations and environmental control systems, which meet or exceed the highest federal, state, and local standards for protection of public health and the environment. This complex network of environmental controls includes a collection of pipes, culverts, holding ponds, and other equipment to manage water and landfill gas, as described in more detail below.

Water at the landfill is separated into two categories for treatment. These are: 1) clean stormwater, and 2) contaminated stormwater, which includes leachate and other water that has potentially come into contact with garbage. Leachate is produced when water percolates through the garbage; it is collected in pipes within the landfill and diverted to lined on-site ponds. In the ponds, the leachate is aerated as a preliminary treatment before being sent to the King County South Wastewater Treatment Plant in Renton. The bottom liner and clay barrier beneath the landfill prevent leachate from seeping into the soil or groundwater. Stormwater that runs off the surface of active landfill areas is also potentially contaminated. It is collected in lined ponds before moving on to the treatment system. Clean stormwater is diverted to detention or siltation ponds to control flow and remove sediment, and is then discharged to surface water off-site.

Landfill gas is generated through the decomposition of waste buried in the landfill. The gas consists of about 50 percent to 60 percent methane, with the remainder made up of carbon dioxide and trace amounts of oxygen, nitrogen, and other gases. Landfill gas from Cedar Hills is collected by using motor blowers to create a vacuum in

Figure 2-6. Landfill gas-to-energy process



The gas collected from the landfill is sent to the Bio Energy Washington plant to be processed into pipeline quality gas

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perforated pipes within the solid waste. The gas used to be routed to high-temperature flares, where it was burned to safely destroy any harmful emissions. In a public/private partnership, Bio Energy Washington, began operating a landfill gas-to-energy facility at the landfill in 2010. The facility runs landfill gas through a series of processors that remove and destroy harmful components and convert the methane portion of the gas into pipeline-quality natural gas. The clean gas is routed through a nearby gas line into the Puget Sound Energy grid and is also used to power the facility (Figure 2-6). The division is also exploring other uses for the gas, such as producing compressed natural gas for operating vehicles. The flare system is kept in standby mode; during maintenance of the energy facility or in the event of an emergency, the flare system can be activated to manage the gas. Air emissions from the flare system are tested regularly and have consistently met or exceeded all applicable environmental regulations.

Solid Waste System Planning

In addition to regulating solid waste handling and disposal, state law also established a framework for planning, authorizing counties to prepare coordinated Comprehensive Solid Waste Management Plans in cooperation with the cities within their borders. While cities can choose to prepare their own plans, all of the incorporated cities within King County, except for Seattle and Milton, have chosen to participate in the development of this single, coordinated regional plan for the incorporated and unincorporated areas of King County. Since July, 1988, cities have entered into interlocal agreements (ILAs) with the county that establish the Solid Waste Division as the lead planning agency. By the time the first Comprehensive Solid Waste Management Plan was adopted by the Metropolitan King County Council in 1990, there were 29 incorporated cities participating in this coordinated effort. Since then, eight new cities have incorporated and joined the King County system – for a total of 37 cities.

To make sound planning decisions, it is important to understand how the solid waste system operates today and to identify changes that might affect it in the future. This information is critical to ensuring that plans for facilities, services, and programs meet the needs of the region in the years to come. Because the system is a combination of public and private entities, working with stakeholders in the early stages of system planning is essential. In addition to working with local jurisdictions and the private-sector collection companies, the division works closely with its two advisory committees – the Solid Waste Advisory Committee (SWAC) and the Metropolitan Solid Waste Management Advisory Committee (MSWMAC). For the preparation of this Plan, the division collaborated with the advisory committees through a process of presentations and discussions.

The next section identifies the participants in the planning process and describes the stakeholder process that guided the development of this plan. Also included is a brief description of the state, county, and city responsibilities in planning the solid waste system.

A Regional Approach

As partners in a regional system, cities share in the costs and benefits of King County's transfer and disposal system. The regional solid waste system was formally established in King County when the county and cities entered into the original Solid Waste Interlocal Agreement of 1988. In 2013, the county worked with the cities to amend the original ILA. The *Amended and Restated Solid Waste Interlocal Agreement* (Amended and Restated ILA) extends the original ILA by 12.5 years, from June 2028 through December 2040 (the full text of the ILA can be found in Appendix C). The longer term will keep rates lower by allowing for longer-term bonding for capital projects. All 37 cities have signed the Amended and Restated ILA. Cities in the regional system are on the following page:

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Algona	Des Moines	Maple Valley	Sea Tac
Auburn	Duvall	Medina	Shoreline
Beaux Arts	Enumclaw	Mercer Island	Skykomish
Bellevue	Federal Way	Newcastle	Snoqualmie
Black Diamond	Hunts Point	Normandy Park	Tukwila
Bothell	Issaquah	North Bend	Woodinville
Burien	Kenmore	Pacific	Yarrow Point
Carnation	Kent	Redmond	
Clyde Hill	Kirkland	Renton	
Covington	Lake Forest Park	Sammamish	

The Amended and Restated ILA includes several enhancements to the original ILA, including provisions for insurance and a potential reserve for environmental liabilities. Other changes include:

- Commitment to the continued involvement of the cities advisory group (to be renamed the Metropolitan Solid Waste Advisory Committee or MSWAC),
- An expanded role for cities in system planning, including planning for long-term disposal alternatives and in establishing financial policies,
- A dispute resolution process, which includes non-binding mediation, and
- Mitigation provisions for host cities and neighboring cities.

Issues specific to individual jurisdictions, such as the city of Bothell annexing areas in Snohomish County, may require an amendment to the ILA that addresses that particular concern.

Both the original and the new ILA assign responsibility for different aspects of solid waste management to the county and the cities. The county is assigned operating authority for transfer and disposal services, is tasked with providing support and assistance to the cities for the establishment of waste prevention and recycling programs, and is the planning authority for solid waste. Each city is designated the authority for collection services within its corporate boundaries and agrees to direct solid waste generated and/or collected within those boundaries to the King County transfer and disposal system.

Cooperation between the county and the 37 cities in a regional system of solid waste management has allowed the division to achieve economies of scale that translate into lower fees for system ratepayers. A significant benefit is the savings realized by being able to extend the life of the in-county landfill for solid waste disposal as a result of improved recycling rates. Economies of scale will continue to be beneficial once the Cedar Hills landfill reaches capacity and closes, and the region transitions to a new method of solid waste disposal. The benefits also extend to the network of recycling and transfer stations that provide convenient, geographically dispersed transfer points around the county. A regional system can operate with fewer transfer facilities than an aggregation of separate, smaller systems. The regional system also allows use of individual stations to be balanced to reduce over- or under-use of any one station. Examples of ways the division may influence station use are: 1) reader boards located at each transfer station that show what the wait times are at the two nearest stations and 2) the online information available for each station showing a picture of the inbound queue and the average disposal time after weigh-in at each station.

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Regional Authorities and Roles

As defined in RCW 70.95.030, solid waste handling includes management, storage, collection, transportation, treatment, utilization, processing, and final disposal. Responsibility for solid waste handling in Washington is divided among the state, counties, jurisdictional health departments, and the cities, as delineated in various legislation, regulations, and agreements. Table 2-2 lists the responsibilities for each entity, its role, and the guiding legislation.

As shown in the table, the state establishes authorities, minimum standards, and planning requirements, and delegates responsibility for implementation to the counties and cities.

Table 2-2. Roles in regional planning and administration

Entity	Role	Guiding Legislation, Regulation, or Agreement
Washington State Department of Ecology	Establish solid waste regulations for management, storage, collection, transportation, treatment, utilization, processing, and final disposal.	Revised Code of Washington (RCW) 70.95
	Delegate authority to the counties to prepare joint comprehensive solid waste management plans with the cities in their boundaries, and review and approve those plans.	RCW 70.95
	Set Minimum Functional Standards for implementing solid waste laws and establishing planning authorities and roles.	Washington Administrative Code (WAC) 173-304, 173-350, and 173-351
Washington Utilities and Transportation Commission	Review the cost assessment prepared with the Comprehensive Solid Waste Management Plan.	RCW 70.95.096
	Regulate solid waste collection services and rates in unincorporated areas and in cities that choose not to contract for solid waste collection services.	RCW 81.77
Washington State Department of Agriculture	Review the preliminary draft plan for compliance with RCW 17.24 and the rules adopted under that chapter.	RCW 70.95.095 and RCW 17.24
Public Health - Seattle & King County (as authorized by the King County Board of Health)	Permit solid waste handling facilities, including permit issuance, renewal, and, if necessary, suspension (handling facilities include landfills, transfer stations, and drop boxes).	Code of the King County Board of Health, Title 10
	Make and enforce rules and regulations regarding methods of waste storage, collection, and disposal to implement the state's Minimum Functional Standards.	Code of the King County Board of Health, Title 10
	Perform routine facility inspections.	Code of the King County Board of Health, Title 10

Entity	Role	Guiding Legislation, Regulation, or Agreement
Puget Sound Clean Air Agency	Issues air operating permits and enforces permit compliance.	RCW 70.94, WAC 173-401 and PSCAA Regulation 1, Article 7
Solid Waste Interlocal Forum (SWIF)	The Regional Policy Committee convenes as the SWIF to advise the King County Council, King County Executive, and other jurisdictions, as appropriate, on all policy aspects of solid waste management and planning, and to review and comment on alternatives and recommendations for the Comprehensive Solid Waste Management Plan and other planning documents.	King County Code (KCC) 10.24.020C, and Interlocal Agreements
King County Solid Waste Division	Provide transfer and disposal services for unincorporated King County and the 37 cities with Interlocal Agreements. Lead the development of waste prevention and recycling programs.	Interlocal Agreements
	Prepare the Comprehensive Solid Waste Management Plan and associated cost assessment.	RCW 70.95.080, KCC Title 10, and Interlocal Agreements
	Establish disposal fees at the landfill, transfer stations, and drop boxes to generate necessary revenue to cover solid waste management costs, including: • Facility operation, • Capital improvements, • Waste prevention and recycling programs, • Grants to cities for recycling programs and special collection events, • Self-haul and rural service, and • Administration and overhead.	RCW 36.58.040, KCC Title 10, and Interlocal Agreements
	Establish level of service and hours of operation for all King County transfer and disposal facilities.	KCC Title 10.10
	Amend hours at transfer facilities, as necessary.	KCC 10.10.020 and 10.10.025
	Designate minimum service levels for recyclables collection in urban and rural areas.	RCW 70.95.092, KCC Title 10.18
	Review impacts of the Comprehensive Solid Waste Management Plan on solid waste and recycling rates.	RCW 70.95
Cities	Participate in the planning process and jointly implement the Plan with the county, provide collection services and waste prevention and recycling programs.	RCW 70.95.080 and Interlocal Agreements

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Entity	Role	Guiding Legislation, Regulation, or Agreement
Solid Waste Advisory Committee	Advise the county in the development of solid waste programs and policies, provide feedback on proposed council actions involving solid waste issues, and comment on proposed solid waste management policies, ordinances, and plans prior to adoption.	RCW 70.95.165 and KCC 10.28
Metropolitan Solid Waste Management Advisory Committee	Advise the Executive, SWIF, and County Council in all matters related to solid waste management and participate in the development of the solid waste management system and waste management plan.	KCC 10.25.110 and Interlocal Agreements

Stakeholder Involvement in the Planning Process

In the development of the Comprehensive Solid Waste Management Plan, the division sought participation and input from many sources, including the cities, the division's advisory committees, the Community Service Areas (unincorporated area community councils), commercial collection companies, the County Council, division employees, labor unions, and the public.

In 2004, the Metropolitan King County Council adopted Ordinance 14971 to establish a process for the 37 cities in the county's service area to collaborate with the division in the early stages of long-term planning and policy development. It set the stage for creation of MSWMAC, which consists of elected officials and staff from participating cities.

MSWMAC and the long-standing SWAC, mandated by RCW 70.95.165, have been instrumental in the development of policies, goals, and recommendations presented in this Plan. SWAC has been an advisory group to the division since 1985, with a membership that is geographically balanced and includes King County residents and representatives from public interest groups, labor unions, recycling businesses, the marketing sector, agriculture, manufacturing, the waste management industry, and local elected officials.

A joint meeting of the MSWMAC and SWAC committees

Both SWAC and MSWMAC have been working with the division to create the

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building blocks that form the basis for this Plan. Collaborative efforts that have helped shape the Plan include:

- Establishing progressive goals for waste prevention and recycling that will further reduce solid waste disposal,
- Conducting in-depth analyses and evaluations of the solid waste transfer system that resulted in the development and adoption of a major renovation and replacement plan for the transfer system network,
- Conducting subsequent in-depth reviews of the renovation and replacement plan for the transfer network, and
- Evaluating strategies for extending the life of Cedar Hills and beginning to explore viable options for waste disposal once the landfill closes.

For the current planning cycle, the division met with SWAC and MSWMAC regularly to discuss their issues and concerns, and hear their perspectives on system planning. The contributions of these committees have been instrumental in developing the Comprehensive Solid Waste Management Plan. The division's SWAC and MSWMAC websites contain background on the committees as well as minutes from their meetings with the division (*http://www.kingcounty.gov/depts/dnrp/solid-waste/about/advisory-committees.aspx*).

Trends in Solid Waste Management

Leading the Way in Waste Prevention, Recycling and Product Stewardship

King County continues to gain distinction as a leader in waste prevention and recycling. Together, the division and the cities work with collection and processing companies and local, state, and national businesses and organizations to develop the innovative programs and services that give the county its leading edge. Some key program developments include:

- The addition of acceptable recyclable materials for collection at the curb and at division transfer stations,
- Growing markets for a wider array of materials for recycling and reuse,
- Successful promotions that encourage waste prevention,
- An increase in product stewardship, including optimizing/reducing product packaging and shipping materials, whereby manufacturers and retailers are assuming responsibility for recycling their products through take-back programs at selected collection sites across the region,
- Advances in the green building industry, including a focus on creating sustainable housing in affordable communities, and
- An increase in the number of organizations that accept materials for reuse, such as clothing and textiles, edible food, and reusable building materials.

With this Plan, the division and its advisory committees set goals to reduce, reuse, and recycle by focusing on specific waste generators and particular materials or products that remain prevalent in the waste stream. The division is also moving toward a sustainable materials management approach as a way to strengthen the economy while reducing the climate effects of materials and harm to the environment. This approach emphasizes the importance of looking at the full life cycle of materials: design and manufacture, use, and end-of-life. Sustainable materials management is being promoted by both the U.S. Environmental Protection Agency and the Washington State Department of Ecology and is discussed in more depth in Chapter 4.

Washington's legislated system for managing unwanted electronic products and mercury-containing light bulbs and tubes illustrates the successes that can be achieved when manufacturers, retailers, local governments, and nonprofit organizations work together on a major initiative. State legislation was passed in 2006 that requires manufacturers of computers, monitors, and televisions – referred to as e-waste – to provide for the recycling of these products beginning in January 2009. As a member of the Northwest Product Stewardship Council, the division helped draft the model legislation that led to formation of the E-Cycle Washington program, which implements this recycling service at no cost for Washington residents, small businesses, small governments, nonprofit organizations, and school districts. The division assisted businesses throughout the county to become authorized e-waste collection sites. Approximately 175,000 tons of e-waste have been collected since the program's inception. Likewise, the LightRecycle WA program, which recycles mercury-containing lights, went into effect in 2015.

Expanding the Collection of Recyclable and Degradable Materials

A change in the collection of curbside recyclables has been the transition to commingled (or single-stream) collection. With this system, all recyclables can be placed in a single, wheeled cart rather than the smaller, separate bins often used in the past. The single cart system not only makes recycling easier and more convenient for the customer, it is more efficient for the companies that provide collection service.

In addition, the division and cities have worked with the commercial collection companies to implement curbside collection of food scraps and food-soiled paper in the yard waste (organics) container. About 99 percent of single-family customers with curbside garbage collection have access to organics (yard waste and food scraps) collection service. Only Vashon Island and the Skykomish and Snoqualmie Pass areas, which house less than one percent of the county's residents, do not have this service. Studies estimate that over 50 percent of those who set out organics carts recycle some of their food scraps. The combined food scraps and yard waste are taken to processing facilities that turn the materials into nutrient-rich compost used to enrich soils.

Building a New Generation of Transfer Stations

Solar panels on the south roof of the Shoreline Recycling and Transfer Station, one of the many green features of the building

Since the approval by the King County Council in 2007 of the *Solid Waste Transfer and Waste Management Plan* (Transfer Plan), the division has been moving forward on the renovation and replacement of the division's urban transfer stations to update technology, incorporate green building features, increase recycling services, and achieve operational efficiencies. New recycling and transfer stations include a flat tipping floor, areas for the collection of a wide array of recyclables, design features that reduce water and energy use, and solid waste compactors. By compacting garbage prior to transport for disposal, up to 30 percent fewer truck trips are required to haul the same amount of garbage.

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In 2008, the division opened the first of five new state-of-the-art transfer stations – the Shoreline Recycling and Transfer Station. The station has exceeded all expectations for environmental excellence with its innovative design and green building features. It received the highest possible honor from the U.S. Green Building Council with a Leadership in Energy and Environmental Design™ (LEED®) Platinum certification. The station has also been the recipient of 15 recognition awards from national, regional, and local organizations, including the Solid Waste Association of North America, the American Institute of Architects, the American Public Works Association, and the Northwest Construction Consumer Council.

Public involvement was a crucial component of the successful design and construction of the Shoreline station. Throughout the process, the division worked closely with the City of Shoreline, neighboring communities, environmental groups, and local businesses and citizens to obtain their input on the project.

The facility design and public process for the Shoreline station have set the bar high for the other recycling and transfer stations approved for construction during this planning period, reflecting:

- How to approach the planning process – incorporating early community involvement,
- How to build them – using the greenest elements possible, and
- How to operate them – pursuing operational efficiencies that reduce fuel, energy, and water use; and increasing recycling opportunities.

Following the success of the Shoreline Recycling and Transfer Station, construction began on the new Bow Lake Recycling and Transfer Station. The design of the new Bow Lake Recycling and Transfer Station builds upon the environmental achievements of Shoreline, with compactors for improved efficiency, water re-use, energy efficient lighting, and solar panels. Providing capacity for about one third of the system's garbage, Bow Lake also offers expanded recycling opportunities. The new recycling and transfer station was completed in 2013 and also earned a Platinum LEED® certification, as well as other awards of excellence.

The most recent station to be completed, the Factoria Recycling and Transfer Station – opened in late 2017. This same year, a site was selected for the South County Recycling and Transfer Station (SCRTS) after completion of a Final Environmental Impact Statement. The selected site is just north of the existing station. Design and construction of the station will take place over the next several years, with an anticipated station opening in 2022.

All new recycling and transfer stations will meet green building, safety and environmental standards; accommodate projected growth in the region; incorporate best practices in transfer and transport operations; and offer a wide variety of recycling opportunities for residential and business customers.

The new Factoria Recycling and Transfer Station opened in late 2017

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Managing Solid Waste Disposal with an Eye to the Future

Cedar Hills is the only landfill still operating in King County. Because use of the county landfill is currently the most economical method for disposal of the region's wastes, the division has been extending its useful life. This strategy, recommended in the Transfer Plan, was approved by the County Council in 2007. In December 2010, the County Council approved a Project Program Plan enabling the division to move forward with further development of Cedar Hills. As approved in the Project Program Plan, a disposal area covering approximately 56.5 acres is being developed – this will extend the life of the landfill to about 2028 depending on a variety of factors, including tonnage received.

The 2001 Plan directed the division to "contract for long-term disposal at an out-of-county landfill once Cedar Hills reaches capacity and closes." With this Plan, the division explored a range of options for future disposal. The Plan's recommendation is to further develop Cedar Hills to maximize disposal capacity. The next disposal method to employ after Cedar Hills reaches capacity is not specifed in this Plan, so that the latest technological advances can be considered. Emerging technologies for converting solid waste to energy or other resources, such as fuels, are in various stages of development and testing in U.S. and international markets. Some of the technologies are capable of processing the entire solid waste stream, while others target specific components, such as plastics or organics. Regardless of which long term disposal option is selected, the transfer system will still be needed to efficiently consolidate loads. The division will continue to monitor emerging technologies and advances in established disposal methods, recycling, and waste prevention. Although the Amended and Restated Interlocal Agreement requires consultation with cities at least seven years before Cedar Hills closes, evaluation of the next disposal method should begin prior to the next plan update to ensure enough time for method selection, planning, and implementation.

Financing the Solid Waste System for the Long Term

As the division continues to modernize the transfer system, keeping fees as low and stable as possible is a fundamental objective.

While division revenues rely primarily on per-ton fees for garbage disposal, the current priorities are to increase recycling and prevent waste generation. Reductions in tonnage due to waste prevention and recycling have been gradual, and the system has adjusted accordingly. However, further reductions will continue to affect system revenues. The division will continue to identify new revenue sources, such as the sale of landfill gas from the Cedar Hills landfill and greenhouse gas offsets from this and other potential sources, and will explore sustainable financing options. The division will also work with its advisory committees and others to develop and/or revise financial policies, and address rate stabilization and cost containment. Policies, actions and more discussion can be found in Chapter 7, *Solid Waste System Finance*.

Protecting Natural Resources through Environmental Stewardship

Environmental stewardship means managing natural resources so they are available for future generations. It also involves taking responsibility – as individuals, employees, business owners, manufacturers, and governments – for the protection of public health and the environment.

Building an environmentally sustainable solid waste management system in King County takes a coordinated, region-wide effort. The division, the cities, and the collection and processing companies in the region are making concerted efforts to help make this happen.

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Waste prevention and recycling are just two of the ways in which the division and others are working to reduce wastes, conserve resources, and protect the environment. Other innovations and well-established programs that support environmental stewardship include collecting and selling landfill gas to be converted to pipeline quality gas, potential new composting and reuse facilities, and providing cleanup assistance for illegal dumping.

The division provides cleanup assistance for illegal dumping

Additional Planning Considerations

Climate Change

Climate impacts are considered by the division when planning for future programs, facilities, and operations, in accordance with Washington State's Solid and Hazardous Waste Plan, *Moving Washington Beyond Waste and Toxics* (Ecology 2015) and the county's *Strategic Climate Action Plan* (King County 2015b). Climate change is manifest in the long-term trends in average weather patterns, including the frequency, duration, and intensity of wind and snow storms, cold weather and heat waves, and drought and flooding. Climate change is attributed primarily to the emission of greenhouse gases (GHG), including such compounds as carbon dioxide and methane. Planning for climate change means taking into account both how we might reduce our effects on the climate, today and in the future, and how changes in climate might affect our facilities and operations.

Against a baseline set in 2007, the Growth Management Planning Council adopted a Countywide Planning Policy that targets a reduction in countywide sources of GHG emissions of 25 percent by 2020, 50 percent by 2030, and 80 percent by 2050. King County will be responsible for assessment and reporting.

At a regional level, the division and its planning participants continue to strengthen and broaden waste prevention and recycling programs to continually improve our long-term, positive effects on the environment (discussed in detail in Chapter 4, *Sustainable Materials Management)*. The benefits are tangible in terms of reductions in GHG emissions, resource conservation, and energy savings.

King County – Cities Climate Collaboration (K4C)

King County and thirteen cities — Bellevue, Burien, Issaquah, Kirkland, Mercer Island, Normandy Park, Redmond, Renton, Sammamish, Seattle, Shoreline, Snoqualmie, and Tukwila — are collaborating through the King County-Cities Climate Collaboration (K4C) to coordinate and enhance the effectiveness of local government climate and sustainability action. Through K4C, county and city staff are partnering on: outreach to engage decision makers, other cities, and the general public; coordination of consistent standards, benchmarks, and strategies; sharing solutions; funding; and shared resource opportunities.

All King County cities are encouraged to join this effort, which is supporting and enhancing projects and programs in focus areas such as green building, using and producing renewable energy, sustainability outreach and education, and alternative transportation.

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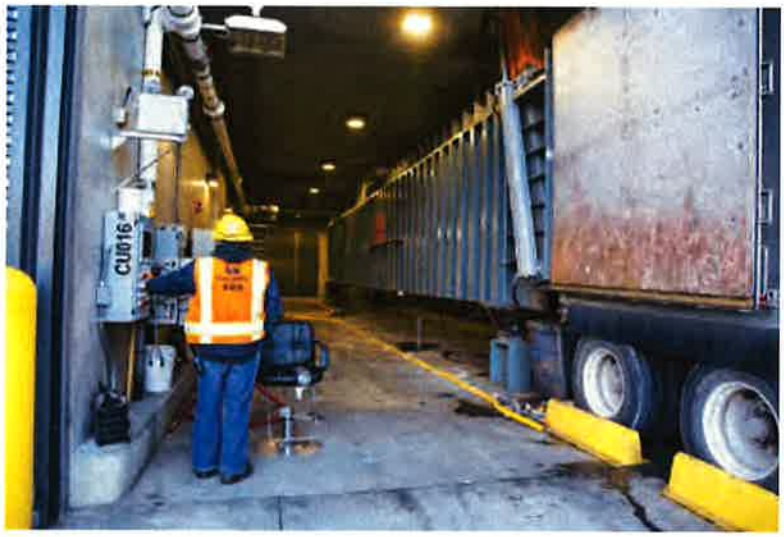
Considerations of how division activities and operations might affect climate change involve both positive and negative impacts on GHG emissions. If areas where GHG emissions can be expected to occur are identified, strategies to mitigate those emissions can be developed, for example:



Compactors at the Factoria Recycling and Transfer Station compact trash, reducing the number of trips that county transfer trucks make to Cedar Hills

- The division contracts with Bio Energy Washington to turn landfill gas into pipeline-quality natural gas for the energy market.
- The division builds facilities (such as the Shoreline, Bow Lake, and Factoria Recycling and Transfer Stations) that are more energy efficient to meet LEED® standards. As previously noted, two of the facilities have earned a Platinum rating.
- Garbage compactors, both for solid waste and recyclables, are being installed at all new urban transfer stations, which will decrease truck trips by up to 30 percent, saving fuel and decreasing emissions.
- In day-to-day operations, the division looks for ways to reduce resource use and increase the use of environmentally friendly products. Examples of operational practices that reduce greenhouse gas emissions include the use of compaction to reduce truck trips, reducing idling time, environmentally preferable purchasing, and exploring the use of compressed natural gas and other low-emitting technologies in trucks and equipment.
- The Food: Too Good to Waste program also helps curb the effects of climate change. Uneaten food accounts for 23 percent of all methane emissions – a potent climate change contributor. When food is thrown away, all the water and energy used to produce, package and transport that food is also wasted. The program educates people about how to plan and prepare meals to decrease the amount of wasted food.

food
TOO GOOD TO WASTE

- The division teamed up with the City of Seattle to produce *Greenhouse Gas Emissions in King County* (Stockholm Environment Institute 2012), a report that looked at greenhouse gas emissions from several different perspectives including undertaking a consumption-based inventory. The inventory offers a more complete picture of the county's environmental footprint, taking into account emissions associated with the production and consumption of food, goods, and services. The report's research shows that efforts such as reducing food waste or purchasing sustainable and low-impact products can help to create a broader and deeper impact on global greenhouse gas emissions.
- The division has planted deciduous and evergreen trees on the Duvall and Puyallup/Kit Corner closed landfills to create a carbon "sink" by capturing carbon dioxide through the process of photosynthesis.

The division also looks at the potential impacts of climate change on facilities and operations and determines strategies for adapting to those impacts. For example, the division is using more drought-tolerant plants in facility landscapes and identifying alternate transportation routes to avoid areas where there may be an increase in seasonal flooding.

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King County – Climate Change

Proper solid waste management plays a significant role in reducing GHG emissions. That role is recognized by both state and local governments in Washington. In 2015, the Washington State Department of Ecology (Ecology) issued its plan, *Moving Washington Beyond Waste and Toxics* (Ecology 2015), which presents a long-term strategy for systematically eliminating wastes and the use of toxic substances. The *2015 King County Strategic Climate Action Plan* (King County 2015b) synthesizes and focuses King County's most critical goals, objectives, and strategies to reduce GHG emissions and prepare for the effects of climate change. It provides "one-stop-shopping" for county decision-makers, employees, and the general public to learn about the county's most critical climate change actions. As documented in the *2011 King County Sustainability Report* (King County 2011), GHG emissions from county operations (for sources other than transit) have stabilized and begun to decline. Building on these successes, achievement of the county's long-term targets is ambitious, but achievable.

King County's overarching targets:

- Communitywide: King County shall partner with its residents, businesses, local governments, and other partners to reduce countywide GHG emissions at least 80 percent below 2007 levels by 2050.
- County operations: King County shall reduce total GHG emissions from government operations, compared to a 2007 baseline, by at least 15 percent by 2015, 25 percent by 2020, and 50 percent by 2030.
- Department of Natural Resources and Parks Carbon Neutral Commitment: The Department became Carbon Neutral in 2016. Both the Solid Waste Division and the Wastewater Treatment Division must be carbon neutral by 2025.

Factoria drought-tolerant plants and permeable pavement

Throughout this Plan, ways to reduce impacts on the climate and adapt to changes that occur are noted.

These actions are grouped in three primary strategies:

Mitigation – directly or indirectly reducing emissions. Examples include reducing energy use at division facilities, reducing fuel use, using hybrid vehicles, distributed composting facilities, using alternative fuels, and promoting waste prevention and recycling to reduce the mining of virgin resources and emissions from manufacturing and processing activities. Another example is the conversion of gas collected at the county's landfill into pipeline-quality natural gas.

Adaptation – modifying facilities and operations to address the effects of climate change. Examples include designing facilities for more severe weather systems (e.g., roofs designed for greater snow loads), using more drought-tolerant plants in facility landscapes, and identifying alternate transportation routes to avoid areas where there may be an increase in seasonal flooding.

Sequestration – removing carbon dioxide from the atmosphere and depositing it back into natural "sinks," such as plants and soils. Examples include planting more trees around facilities to remove carbon dioxide through photosynthesis, using biochar, and using compost to replenish depleted soils and promote plant growth.

Gas collection pipes at the Cedar Hills landfill

Equity and Social Justice

The division adheres to the *King County Equity and Social Justice Strategic Plan 2016-2022* (King County 2016b) which emphasizes that King County is committed to ensuring that equity and social justice are considered in the development and implementation of policies, programs, and funding decisions. **Equity** is achieved when all people have an equal opportunity to attain their full potential. Inequity occurs when there are differences in well-being between and within communities that are systematic, patterned, unfair, and can be changed. These differences are not random; they are caused by our past and current decisions, systems of power and privilege, policies, and the implementation of those policies. **Social justice** encompasses all aspects of justice, including legal, political, and economic; it demands fair distribution of public goods, institutional resources, and life opportunities.

In solid waste system planning, the division examines ways that it may affect equity and social justice through its programs and services.

- Fair distribution of transfer facilities, services at the facilities, and division resources, such as the community litter cleanup, school education, and green building programs, helps ensure that everyone has access to services that create safer and healthier communities.
- The division provides technical assistance to ensure that the benefits of green building strategies, such as lower energy costs and improved indoor air quality, are available to residents of affordable housing developments.
- In siting new transfer facilities, the division engages communities to ensure equal opportunity for involvement in the siting process. The division uses demographic data to ensure that these essential public facilities are distributed equitably throughout the county and that any negative impacts of the facilities do not unfairly burden any community.
- In addition to translating materials into multiple languages, the division has added a Spanish-language component to its comprehensive outreach programs. Rather than simply translate existing materials, the division has worked directly with the local Spanish-speaking communities to create new programs and materials in Spanish that respond to the questions and needs of these communities, an approach referred to as transcreation.

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Green Building and Equity

The goal of the county's Equity and Social Justice Ordinance is for all King County residents to live in communities of opportunity. To reach this goal, all communities must be equipped with the means to provide residents with access to a livable wage, affordable housing, quality education, quality health care, and safe and vibrant neighborhoods. Green building can play an important role in providing safe, healthy, and affordable housing, public infrastructure, and commercial facilities, which have historically not been built to the highest green standards.

There exists a variety of equity and social justice opportunities on any project including: education, training, apprenticeship, procurement, material selection, contracts, public outreach, public service, community amenities, communication, indoor and outdoor air quality, economic development, job creation, and more.

King County's Sustainable Infrastructure Scorecard, the green building rating system used for county-owned projects not qualified for the LEED® certification, contains a Social Equity Credit as an opportunity to address equity and social justice issues. The county's Green Building Team is also working on additional guidance for capital projects to utilize an equity impact review tool, designed to help project teams to evaluate how people and places are impacted by an action, and to take into consideration distributional, process, and cross-generational equity.

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Solid Waste Division

3 Forecasting and Data

Policies

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FD-1 Monitor and report the amount, composition, and source of solid waste entering the transfer and disposal system.

FD-2 Update the solid waste tonnage forecast to support short- and long-term planning and budgeting for facilities and operations.

FD-3 Monitor and report waste prevention and recycling activity, including the amount of materials recycled, programmatic achievements, and the strength of commodity markets.

FD-4 Continue to monitor new and emerging technologies to identify opportunities for their use in managing solid waste and recyclables.

Summary of Recommended Actions

The following table includes a menu of recommended actions that the county and the cities should implement. Under the responsibility column, the entity listed first has primary responsibility for the action, bold indicates that the entity has responsibility for the action, and a star (*) indicates that the action is a priority. If the responsibility is not in bold, the action has lower implementation priority.

Action Number and Responsibility	Action	Detailed Discussion
1-fd Cities, county, collection companies	Standardize the sampling methodology and frequency in tonnage reports submitted to the division and the cities by the collection companies to improve data accuracy.	Page 3-11
2-fd County	Perform solid waste, recycling, organics, and construction and demolition characterization studies at regular intervals to support goal development and tracking.	Page 3-12
3-fd County	Monitor forecast data and update as needed.	Page 3-1
4-fd County, cities, Ecology	Develop voluntary agreements with recycling companies that will improve data reporting and resolve data inconsistencies.	Page 3-12

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Forecasting and Data

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The monitoring of solid waste disposal, recycling, and waste prevention, and the forecasting of future trends are fundamental to system planning. The division routinely collects data about the amount and composition of waste and recyclable materials in the system, tracks demographic and economic trends that will affect the amount of solid waste generated in the future, and conducts focused studies to address specific topics, such as markets for recyclable materials, industry trends, and new technologies.

Forecasts are used to estimate the amount of material expected to be disposed and recycled in the coming years, incorporating expected growth in population and other demographic and economic trends. This information can be used to estimate the necessary capacity of division transfer and disposal facilities and associated private-sector recycling facilities and markets.

Existing data and forecasts form the basis for discussions with cities and other stakeholders about options for the future, answering questions such as:

Division staff review plans

- How much waste are system users currently generating and expected to generate in the future?
- How can waste generation be reduced?
- What materials can be separated from the disposal stream and turned into a resource through reuse and recycling?
- Who uses the solid waste facilities and curbside services, how do they choose those services, how often do they use those services, and what influences their choices?
- What is the best method to provide these services?
- What changes in markets and technologies need to be incorporated into our analysis of options for the future?

Forecasts, planning data, and studies used in the development of this Plan are discussed in the following sections.

Forecasting

The division uses a planning forecast model to predict future waste generation over a 20-year period. Waste generation is defined as waste disposed plus materials recycled. The forecast is used to guide system planning, budgeting, rate setting, and operations. The primary objectives of the model are to 1) estimate future waste disposal and 2) provide estimates of the amount of materials expected to be diverted from the waste stream through division and city waste prevention and recycling programs. The planning forecast model – a regression model - relies on established statistical relationships between waste generation and various economic and demographic variables that affect it, such as population, employment, consumption[1] (measured as retail sales, excluding sales), and the tipping fees for garbage at division facilities.

1 *The numbers for the sales tax base is taken from "The Puget Sound Economic Forecaster" which is published by Western Washington University. Sales tax base and price information are all adjusted for inflation.*

In late 2007, a nationwide financial crisis severely compromised the division's ability to forecast short-term trends in the economy. With the collapse of large financial institutions, a downturn in the stock market, a drop in housing prices and personal income, a jump in the unemployment rate, and a general slump in overall economic activity, the recession led to the bankruptcy of many businesses and home foreclosures. The effects of these dramatic events touched every sector of the economy including the solid waste industry.

In 2007, garbage tons received at Cedar Hills surpassed the one million mark, due primarily to steady economic growth and population increases in the region over the previous few decades. Between December 2007 and December 2012, however, garbage tons disposed at Cedar Hills declined 20 percent overall. Garbage tons dropped eight percent in 2008 alone. The City of Seattle, surrounding counties, and jurisdictions in Oregon and California reported similar or greater declines in tonnage, as did regional recycling firms.

The recession created a great deal of unpredictability in variables used in the division's forecast model to predict the short-term (one to five year) trends in solid waste generation. To respond to this uncertainty, the division has adjusted its approach to forecasting, using a more flexible system of ongoing monitoring. This evolving forecast method involves:

- Monitoring solid waste tons delivered to division transfer stations and the Cedar Hills landfill on a daily basis,
- Regularly checking regional and state-wide economic forecasts (local economic forecasts by the Western Washington University (former Dick Conway and Associates), King County's economic forecast, and forecasts by the Washington State Economic and Revenue Forecast Council),
- Monitoring state-wide tax revenue streams, particularly in the home improvement sector, furniture store sales, clothing sector, and other key markets, and
- Communicating regularly with other jurisdictions about the trends in their service areas.

This information has been used to forecast short-term tonnage and subsequent revenues for use in critical budgeting, expenditure control, and management of capital projects over the three-to five-year period.

With the new model established in 2018, the division is able to provide a prediction for disposal for the next ten years. After ten years, the tonnage forecast uses a long-term growth rate based on historical tonnage (described in further detail below). The new model also assumes that a years-long Ecology-reported recycling rate of 52 percent is sustained through 2040.

An additional feature the division included in the new model is an upper and a lower estimate for the tonnage to be disposed.

The main characteristics of the new model are:

- Main Model
  - This uses the tonnage forecast model output to forecast the next 10 years, out to 2028.
  - After 2028, a historical trend is used to generate the disposal tons for the years from 2029-2040:
    - This annual growth rate is 1.73 percent, and
    - This historical trend is based off the disposal growth rate from 1995-2007. This period covers years after some major changes in the system occurred during the early 1990s (Seattle leaving the system, recycling changes, etc.) but before the Great Recession so it's an appropriate time period to use as a steady-state historical trend.
- Upper Boundary
  - This incorporates the aggressive population growth rate provided by the Office of Financial Management (OFM) into our tonnage forecast model for the next 10 years, out to 2028.
  - After 2028, a high growth rate is used to generate the disposal for years from 2029-2040:
    - This annual growth rate is 2.91percent, and
    - This growth rate for disposal is based on the period from 2012-2017, which has been a period of high growth since the Great Recession.

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- Lower Boundary
  - This incorporates the conservative population growth rate provided by the Office of Financial Management (OFM) into our tonnage forecast model for the next 10 years, out to 2028.
  - After 2028, a low growth rate is used to generate the disposal for the years from 2029-2040:
    - This annual growth rate is 0.57percent, and
    - This growth rate is from 1995-2017, which is the historical trend line plus the Great Recession and recovery.

Increases in population, employment, and consumption lead to more waste generated. Studies indicate that for the long-term planning forecast through 2040, the following trends are expected:

- Population[2] is expected to grow at a steady rate of one percent per year. Population growth is directly correlated with the amount of waste generated; i.e., more people equal more waste generated. See Figures 3 -1 for estimates for population growth in each transfer station service area and Figure 3 -2 for the projected share of population growth in each service area.

- Employment is expected to increase at an annual rate of two percent. Increased employment activity typically leads to an increase in consumption and waste generation.

2 *Projections for population and employment are based on 2017 data from the Land Use Vision 2 model developed by the Puget Sound Regional Council (PSRC). Data provided by PSRC are based on U.S. Census and other data sources and developed in close cooperation with the county and the cities.*

Figure 3-1. Transfer station service areas population 2025-2040

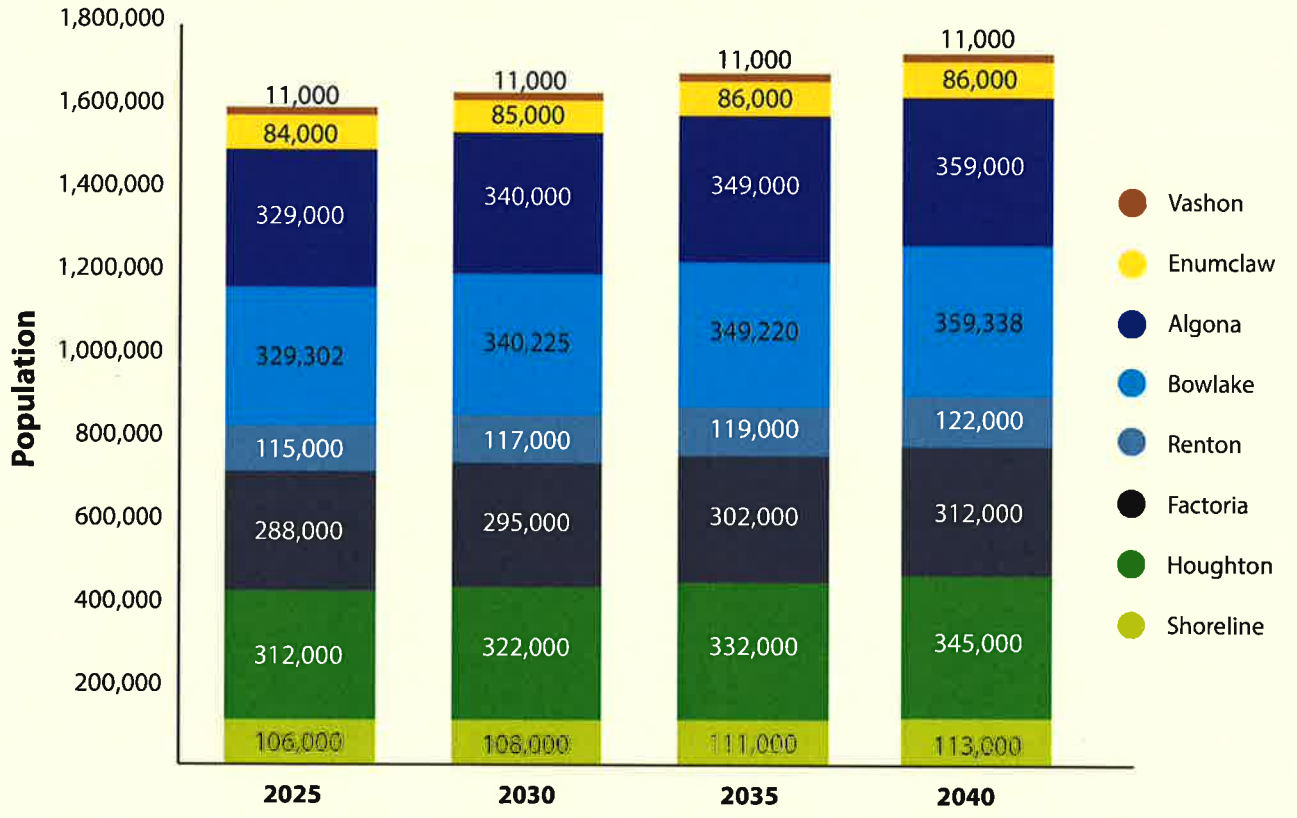
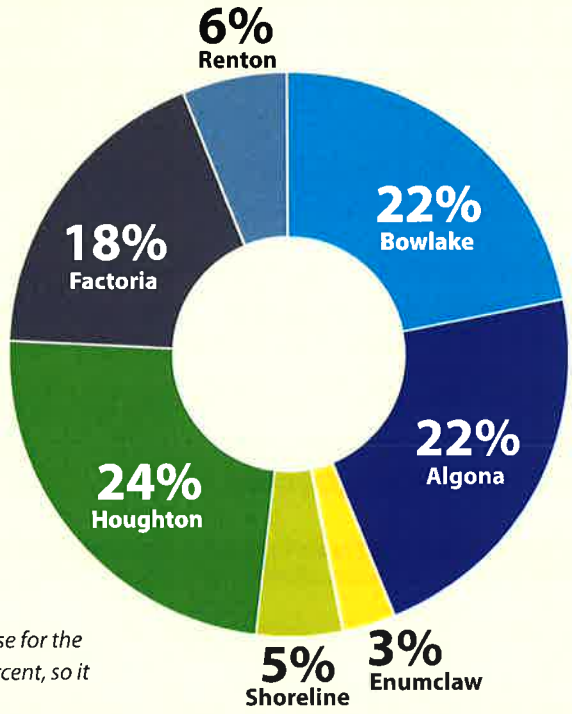


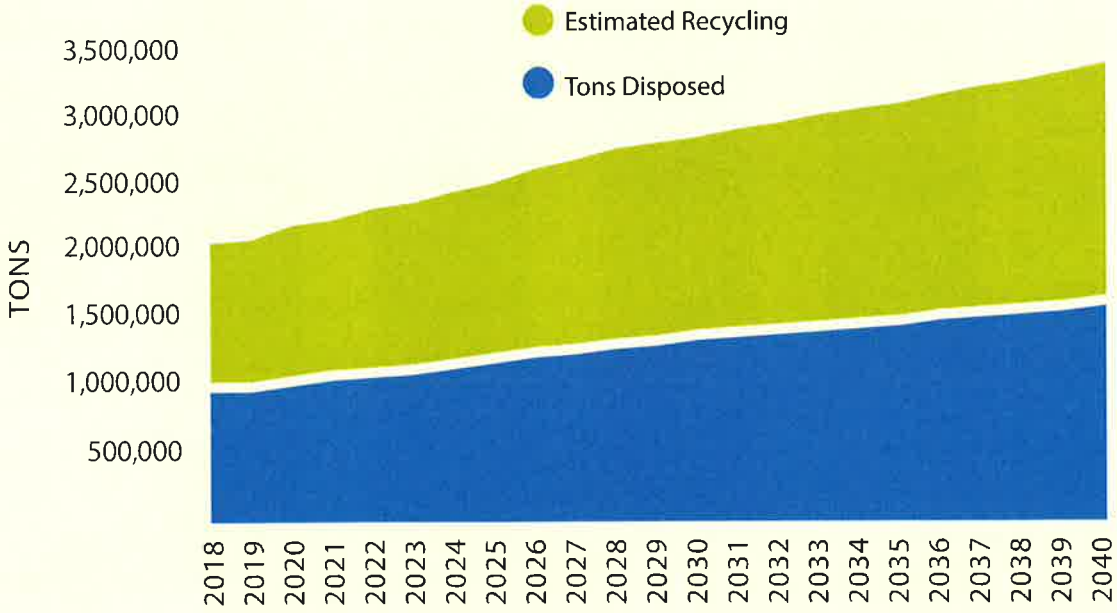
Figure 3-2. Estimated share of population increase 2025 - 2040 for transfer station service areas



Note: The share of population increase for the Vashon Service area is less than 1 percent, so it is not indicated in this figure.

The projections shown in Figure 3-3 are based on the 2018 forecast. The tonnage forecast will be routinely adjusted to reflect factors that affect waste generation, such as the success of waste prevention and recycling programs and future events that affect economic development.

Figure 3-3. Projection of solid waste recycled and disposed 2018 - 2040

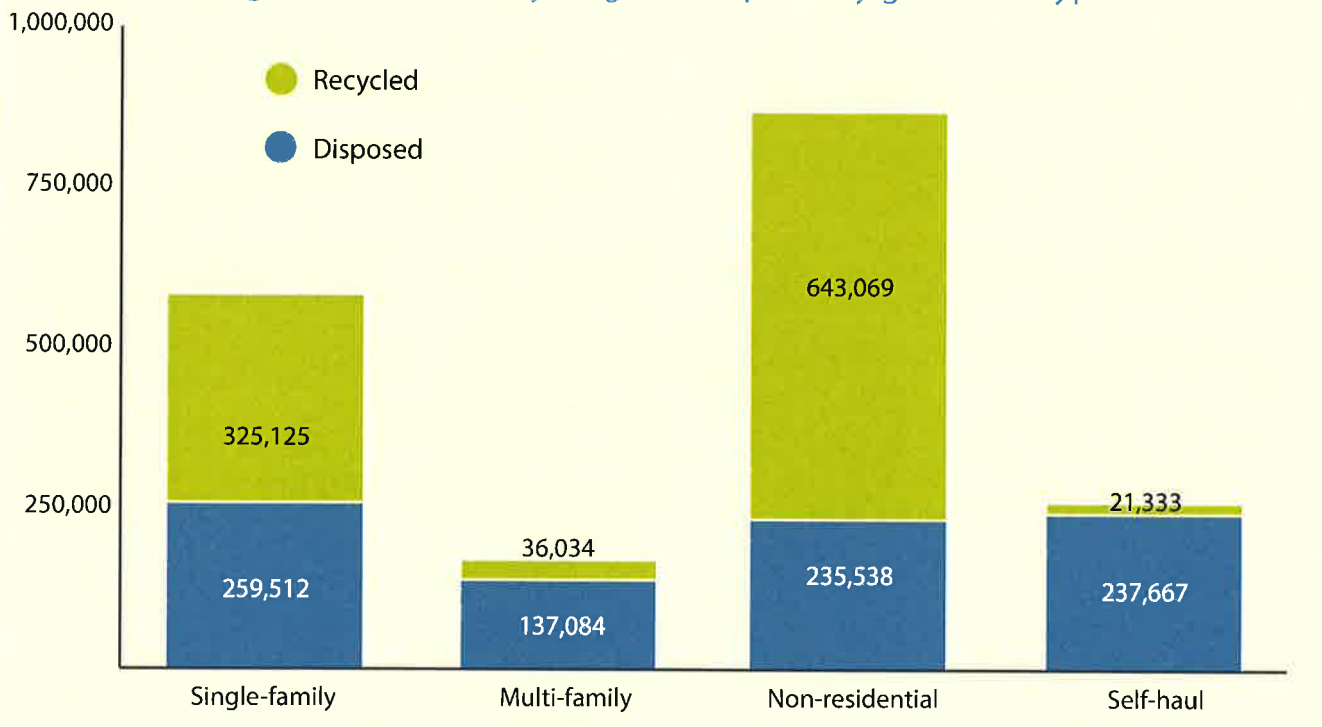


Current Data on Regional Waste Generation, Recycling, and Disposal

Measuring the results of waste prevention and recycling efforts is a complex process. Discussions and data often focus on recycling and recycling rates, when in fact waste prevention is the number one priority. While programmatic successes for waste prevention can be assessed qualitatively, it is difficult to measure directly how much waste is "not created" in terms of tons or percentages. What can be measured more accurately is recycling and disposal activities. Data for these activities are available through division tonnage and transaction records, reports from the curbside collection companies, the Washington State Department of Ecology (Ecology), and the division's waste characterization studies. Using data on the types and amounts of materials recycled, combined with measures of waste disposed, the division can evaluate its success in reaching the goals established with each successive comprehensive solid waste management plan.

Figure 3-4 shows the tons of materials recycled and disposed in 2015 (most recent data from Ecology) by category of waste generator – single-family residents; multi-family residents; non-residential customers such as businesses, institutions, and government entities; and self-haulers who bring materials directly to the division's transfer stations. More specific information on each generator type (including generators of construction and demolition debris for recycling and disposal) follows. Recycling data comes from numerous external sources. These are described in more detail in the section *Tracking Our Progress*. Note that the scale on each figure varies.

Figure 3-4. 2015 Recycling and disposal by generator type



While there has been considerable progress in waste prevention and recycling over the years, there is still room for improvement. As Figure 3-4 illustrates, the single-family sector provides the greatest opportunity to divert materials from disposal, with about 260,000 tons of materials disposed in 2015. Single-family residents are recycling more than

56 percent of their waste, but division studies indicate that a large portion of the disposed materials could be recycled or reused (as discussed in the next section). The multi-family sector generates the least amount of garbage and recycling of all sectors, but shows a need for improvement in recycling.

The data shows that self-haulers as a group are recycling the smallest fraction of their waste. That may be because at many of the older transfer stations there is limited or no opportunity to recycle. At this time, however, two of the division's urban stations are undergoing, or are being considered for, renovation. A major goal of the renovation plan is to add space for collection of more recyclables and to build flexibility into the design to allow for collection of additional materials as markets develop. Adding space for collection of greater amounts and a wider array of materials is expected to result in higher recycling rates at the transfer stations.

With studies indicating that 70 percent of the waste that reaches the landfill could have been recycled or reused, and specific data on what those materials are, we can focus on areas that will have substantial influence on the region's per capita disposal rate. The following sections address each category of generator and identify some of the more significant areas for improvement.

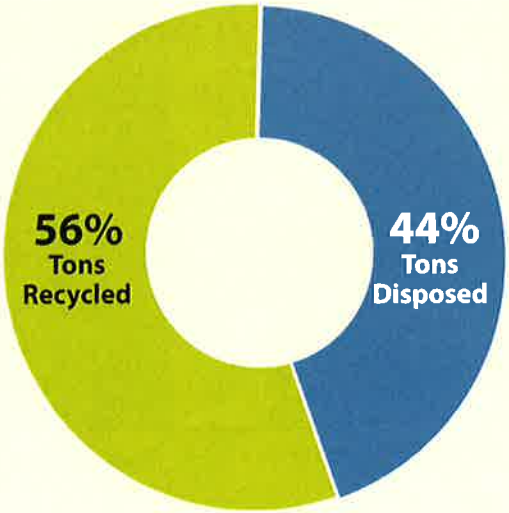
Single-Family Residents

Sixty-five percent of the households in the division's service area are single-family homes. In 2015, these single-family households recycled on average about 56 percent of their waste. Ninety-six percent of the yard waste and 79 percent of the paper generated were recycled by this sector in 2015 (Figure 3-5). While food scraps and food-soiled paper made up over 35 percent of the waste disposed by single-family residents in 2015, recycling of these materials has increased as participation in the curbside collection program for these materials continues to grow. Considerable amounts of the standard curbside recyclables – glass and plastic containers, tin and aluminum cans, mixed waste paper, newspaper, and cardboard – while easily recyclable, are still present in the waste disposal stream.

Figure 3-5. 2015 Recycling and disposal by single-family residents

Material	Tons Recycled	
Containers*	9%	30,666
Plastic bags & Wrap	1%	4,619
Mixed paper, newspaper, cardboard	32%	103,647
Food scraps & food-soiled paper	0%	293
Yard waste	49%	160,463
Scrap metal	5%	15,101
Other materials	3%	10,336

Tons Recycled: 325,125



Total Tons Generation: 584,636

Material	Tons Disposed	
Containers*	2%	5,740
Plastic bags & Wrap	8%	21,695
Mixed paper, newspaper, cardboard	10%	26,901
Food scraps & food-soiled paper	35%	89,848
Yard waste	3%	7,285
Scrap metal	3%	6,895
Other materials	39%	101,147

Tons Disposed: 259,511

*Tin, aluminum, glass, and plastic

Recommendations for improving and standardizing curbside collection for single-family residents are discussed in Chapter 4, *Sustainable Materials Management*. Other recyclables found in the single-family waste stream in smaller amounts include scrap metal, textiles, plastic bags and plastic wrap, and some construction and demolition debris, such as clean wood and gypsum wallboard.

If all recyclable materials were removed from the single-family waste stream, nearly one-third of the remaining, non-recyclable materials would be disposable diapers and pet wastes.

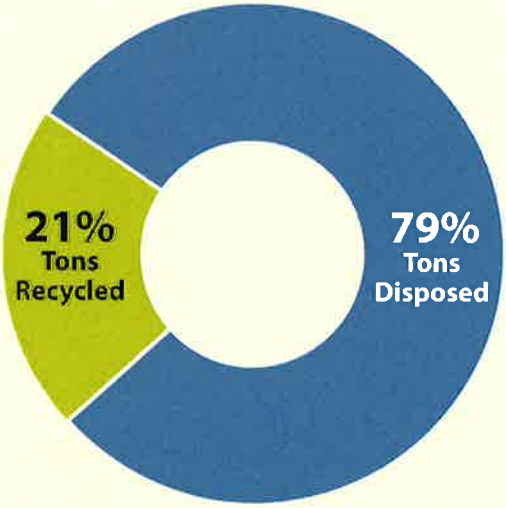
Multi-Family Residents

Thirty-five percent of the households in the service area are in multi-family complexes. In 2015, the average multi-family recycling rate in the county's service area was 21 percent. While this rate is considerably lower than the single-family rate, overall generation and disposal from multi-family residences is lower and the difference from single-family recycling rates is less when yard waste (which is minimal for multi-family) is removed from the calculation. As with single-family residents, the primary areas of opportunity are in recycling food scraps and food-soiled paper and the standard curbside recyclables, including paper and cardboard (Figure 3-6).

Figure 3-6. 2015 Recycling and disposal by multi-family residents

Material	Tons Recycled	
Containers*	20%	7,348
Plastic bags & Wrap	3%	1,014
Mixed paper	63%	22,752
Food scraps & food waste	0%	-
Yard waste	3%	1,206
Scrap metal	9%	3,315
Other materials	1%	399

Tons Recycled: 36,034



Total Tons Generation: 173,118

Material	Tons Disposed	
Containers*	3%	3,969
Plastic bags & Wrap	7%	9,007
Mixed paper	14%	18,872
Food scraps & food waste	32%	44,445
Yard waste	2%	3,157
Scrap metal	3%	3,733
Other materials	39%	53,901

Tons Disposed: 137,084

*Tin, aluminum, glass, and plastic

Other materials present in the multi-family waste stream, both recyclable and non-recyclable, are similar to those found in the single-family waste stream.

It is difficult to track multi-family recycling rates because of: 1) the varied nature of multi-family complexes, 2) the growth in construction of mixed-use buildings that contain both residential and non-residential units, and 3) the varied levels of recycling services provided. What is clear is the need to provide adequate space for garbage and recyclables collection at these complexes and to standardize collection across the county.

A detailed discussion of ways to improve recycling at multi-family and mixed-use complexes is provided in Chapter 4, *Sustainable Materials Management*.

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Non-Residential Generators

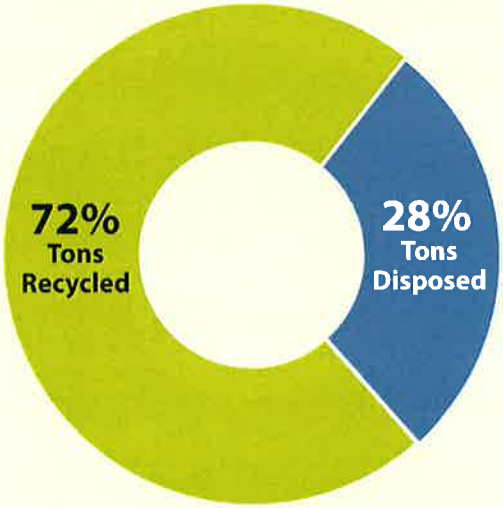
Nonresidential generators – businesses, institutions, and government entities – recycled an estimated 73 percent of their waste in 2015. Despite having the highest recycling rate of any sector, non-residential generators still present an opportunity for increasing King County's overall recycling rate (Figure 3-7). There are an estimated 771,000 employees in the service area working at an estimated 49,000 businesses and organizations. The make-up of the non-residential sector ranges from manufacturing to high-tech and retail to food services. The recycling potential for any particular business or industry varies depending on the nature of the business. For example, restaurants and grocers are the largest contributors of food waste, while manufacturers may generate large quantities of plastic wrap and other packaging materials. Because of the diversity of business and industry in the region, a more individualized approach is needed to increase recycling in this sector.

There are significant opportunities in the non-residential sector to increase the diversion of food scraps and food-soiled paper. The largest increase will be realized as more restaurants and grocers contract with private-sector companies to collect their food scraps for composting and more cities begin to offer commercial organics collection.

Figure 3-7. 2015 Recycling and disposal by non-residential generators

Material	Tons Recycled	
Containers*	4%	24,487
Plastic bags & Wrap	2%	10,733
Mixed paper, newspaper, cardboard	39%	237,893
Food scraps & food-soiled paper	18%	110,940
Clean wood	5%	27,186
Yard waste	2%	10,303
Scrap metal	14%	84,524
Carpet and pad, furniture, mattresses	0%	-
Other materials	16%	96,841

Tons Recycled: 602,907



Total Tons Generation: 838,444

Material	Tons Disposed	
Containers*	2%	5,726
Plastic bags & Wrap	10%	23,037
Mixed paper, newspaper, cardboard	17%	39,684
Food scraps & food-soiled paper	31%	72,920
Clean wood	4%	9,629
Yard waste	4%	8,614
Scrap metal	3%	6,895
Carpet and pad, furniture, mattresses	2%	4,748
Other materials	27%	64,284

Tons Disposed: 235,537

*Tin, aluminum, glass, and plastic

Another opportunity for reducing overall disposal is with commercially generated paper. While large amounts of paper are being recycled, almost 40,000 tons of recyclable paper were disposed by businesses in 2015. Paper may also provide an opportunity for waste prevention – not just moving from disposal to recycling, but aiming to reduce the generation of waste paper.

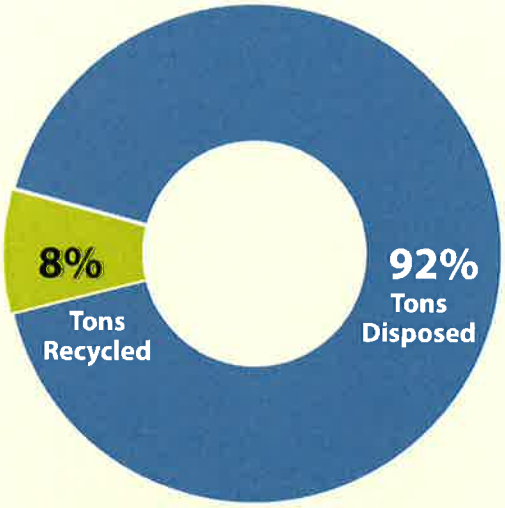
Self-haulers

Self-haulers are residential and non-residential customers who choose to bring garbage and recyclables to the transfer facilities themselves. According to on-site surveys conducted as part of the division's waste characterization studies, the two most common reasons given for self-hauling are: 1) having a large quantity of waste or large or bulky items to dispose, and 2) wanting to avoid the cost of commercial collection. About 37 percent of the materials disposed by self-haulers have the potential for recycling, most significantly clean wood, yard waste, scrap metal, and paper (Figure 3-8).

Figure 3-8. 2015 Recycling and disposal by transfer facility self-haulers

Material	Tons Recycled	
Curbside recyclables*	23%	4,781
Food scraps & food-soiled paper	0%	-
Clean wood	10%	2,096
Yard waste	55%	11,723
Scrap metal and appliances	12%	2,571
Carpet and pad, furniture, mattresses	0%	-
Other materials	0%	62

Tons Recycled: 21,233



Total Tons Generation: 258,901

Material	Tons Disposed	
Curbside recyclables*	9%	21,362
Food scraps & food-soiled paper	2%	5,168
Clean wood	14%	32,331
Yard waste	5%	11,322
Scrap metal and appliances	9%	21,521
Carpet and pad, furniture, mattresses	12%	28,712
Other materials	49%	117,252

Tons Disposed: 237,668

*Glass and plastic containers, tin and aluminum cans, mixed paper, newspaper, and cardboard

At the older stations and drop boxes where space is limited, the division provides collection containers for the standard curbside recyclables, which include glass and plastic containers, tin and aluminum cans, mixed waste paper, newspaper, and cardboard. No recyclables are collected at the Algona Transfer Station due to space limitations. At the stations that have been renovated and there is more space, additional materials such as textiles, scrap metal, used bikes and appliances are also collected. Other materials will be collected as markets develop. There are a number of materials still prevalent in the self-haul waste stream for which there are currently insufficient or no recycling markets, such as treated and painted wood.

Generators of Construction and Demolition Debris

In 2015, nearly 900,000 tons of construction and demolition debris were generated in King County. Debris from the construction, remodeling, repair, or demolition of buildings, other structures, and roads includes clean wood,

painted and treated wood, dimensional lumber, gypsum wallboard, roofing, siding, structural metal, wire, insulation, packaging materials, and concrete, asphalt, and other aggregates.

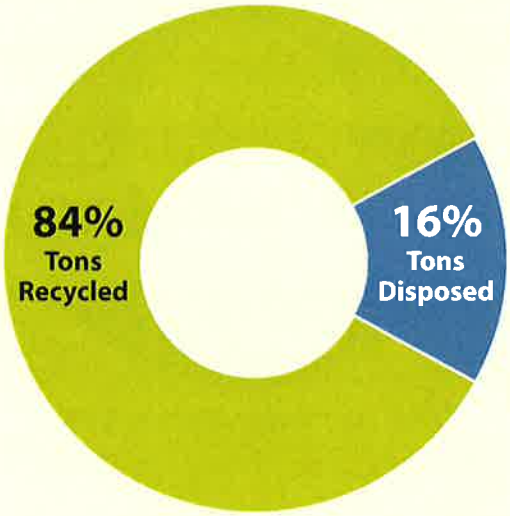
Clean wood makes up about 24 percent of the construction and demolition debris that is being disposed. Other recyclable construction and demolition materials that are being disposed include scrap metal, clean gypsum, and asphalt shingles.

Figure 3-9 shows the composition of construction and demolition materials diverted and disposed in 2015 based on reports from private processing facilities, Ecology data, and waste monitoring at the division's transfer stations (Cascadia 2012a). Most concrete, asphalt, and aggregates are source separated for recycling at jobsites and are not reflected in these numbers. For more information on construction and demolition debris collection and recycling see Chapter 4, *Sustainable Materials Management*.

Figure 3-9. 2015 Construction and demolition materials diverted and disposed

Material	Tons Recycled	
Clean wood	4%	35,245
Asphalt roofing	0%	2,432
Clean gypsum	5%	43,435
Metals	21%	186,680
Aggregates[a]	58%	507,583
Other recyclable materials[b]	0%	2,462
Materials with low recycling potential[c]	11%	99,594

Tons Recycled: 877,431



Total Tons Generation: 1,049,399

Material	Tons Disposed	
Clean wood[a]	24%	41,272
Asphalt roofing	17%	28,891
Clean gypsum	6%	9,802
Metals	4%	6,707
Aggregates[a]	6%	11,178
Other recyclable materials[b]	15%	25,451
Materials with low recycling potential[c]	28%	48,667

Tons Disposed: 171,968

[a]Diverted total includes only aggregate material (asphalt/concrete, brick and masonry) processed at mixed construction and demolition debris processing facilities; it does not include aggregate materials that are source separated at jobsites, which comprise approximately 450,000 tons of asphalt/concrete.
[b]Includes glass, yard waste, carpet and pad, textiles, plastics, and paper.
[c] Includes painted and treated wood, painted/demolition gypsum, plastics, and other mixed construction and demolition debris.

Tracking Progress

The division uses a wide range of available data, both qualitative and quantitative, to evaluate the success of waste prevention and recycling efforts. Over the years, the division has developed a robust collection of surveys and data from a variety of sources to track progress. In most cases, more than one source of data is needed to accurately quantify how well the region is doing in diverting materials from the waste stream. For example, to track progress toward a target of 4.1 or fewer pounds of waste per employee per week, the number of employees in the service area for a given year is divided into the annual tons of garbage generated by the non-residential sector, as reported

in customer surveys conducted at transfer stations and information submitted to the division by the collection companies. Using these data, pounds per week can be calculated. The targets are tracked using aggregate data for the service area, rather than using data by individual city or unincorporated area.

The following subsections provide information on the types of data collected, how those data are calculated, and how reliable the data are, as well as recommendations on how the data might be improved.

Tonnage and Transaction Data

An automated cashiering system is used to track data on the tons of garbage received and number of customer visits at division transfer facilities. In-bound and out-bound scales weigh loads for all vehicles except fixed-rate vehicles (as defined in KCC 10.04.020 MM), which are charged a minimum fee that assumes a weight of 320 pounds or less. These data are used to track overall garbage tonnage and transactions at individual stations. Data for recyclables accepted for a fee, such as yard waste, are also tracked by the cashiering system. For recyclables collected at no charge, data are provided to the division by the hauling company that is contracted to collect them.

Reports from the Commercial Collection Companies

The private-sector companies that provide curbside collection of residential garbage and recyclables throughout most of King County submit monthly tonnage reports to the division. These reports are also provided to the cities. Data for single-family households are the most complete, providing the following monthly information for each city and for unincorporated areas operating under a Washington Utilities and Transportation Commission tariff:

- Tons of garbage disposed,
- Tons recycled by material type,
- Tons of organic materials recycled (yard waste, including food scraps for most areas), and
- Number of garbage, recycling, and organics collection customers.

Generally, customer counts and tonnage numbers for single-family garbage, recycling, and organics are the most reliable because they are based on weights measured at the entrance scale of either county transfer stations (for garbage) or material recovery facilities (for recyclables). To estimate the tons of individual materials (such as newspaper, aluminum cans, and so on), collection companies take periodic random samples and determine the percentage of each material present in the loads. As overall recycling tonnage is weighed, tons for individual materials are allocated based on the percentages obtained in the random sampling. The county has worked with the haulers to develop and implement a standard protocol for sampling in order to provide reliable estimates of the component recyclables and contaminant materials.

The same information provided for single-family residents is provided for multi-family residents and nonresidential generators; however, the per capita data are less accurate because the number of apartment units and business customers is not provided. In some cases, the same truck collects multi-family and nonresidential wastes, so collection companies must estimate how much waste comes from each generator type. Even though some waste may be allocated to the wrong generator type, overall changes in recycling and disposal are reflected in tonnage totals, thereby providing a reasonable indicator of change.

Since non-residential recycling collection is open-market and because many companies besides the large hauling companies provide commercial recycling services, a non-residential recycling rate cannot be calculated from the collection company data. This means that an overall system-wide recycling rate cannot be calculated using these data alone.

Ecology Survey Data

Data on the total tons recycled come from the annual statewide survey of recycling companies conducted by Ecology. These data supplement curbside collection data by including recyclables collected by private sector companies across the region. Recycling companies are required by state law to report tonnage data on the survey, which asks for tons by material type, by generator type (residential or non-residential), and by the county in which the materials were generated. For King County, companies are also asked if materials were generated in the City of Seattle.

The division uses the Ecology survey data to estimate both non-residential and overall recycling rates. All of the recycling tonnage reported by Ecology is counted as non-residential except for tonnage that was included in residential collection company reports and recycling tonnage from transfer stations. Use of this accounting method means that recyclables taken by residents to privately owned drop boxes or recycling centers are included in the non-residential recycling tonnage. Ecology survey data are also used to estimate construction and demolition debris diversion.

While the Ecology data provide the status of statewide efforts, there are some limitations to the usefulness of the data for local planning and evaluation, including the following:

- Because data from Ecology is not immediately available, there is about a three-year lag before the county is able to finalize annual recycling rates,
- Data are self-reported by recycling companies, with few resources available to Ecology for checking accuracy,
- Companies make unverified estimates about the county in which the recyclables were generated, and the reporting for data between King County and the City of Seattle has been inconsistent, resulting in tonnage variations from year to year which seem unlikely,
- City-specific information, other than for the City of Seattle, is not available,
- The identification of residential versus non-residential sources is not reliable,
- The identity of some companies that report data is confidential, limiting the ability to verify the quantities reported, and some of the companies with confidential data report only statewide totals, which requires the county to estimate allocation based upon population percentages, and
- Significant amounts of metal are reported; it is difficult to determine how much of this metal should be counted as municipal solid waste, how much as construction and demolition debris, and how much as auto bodies, which the county does not include in its waste generation or recycling totals.

Improving the reliability of recycling data would greatly benefit our ability to evaluate progress in reaching our recycling goals. The division will work with Ecology and the cities to develop voluntary agreements with recycling companies that will improve data reporting and resolve data inconsistencies.

Waste Characterization Studies

Since 1990, the division has conducted a Waste Monitoring Program to understand who uses solid waste system facilities, what materials they bring to the stations, how and why they use our facilities, and how satisfied they are with the services provided. To answer these questions, the division retains consultants to conduct both waste characterization studies and customer surveys that analyze the municipal solid waste received at county facilities

for disposal at Cedar Hills. For these studies, the waste stream is examined by collecting and sorting sample loads delivered to transfer facilities in King County. These studies help the county and the cities understand the composition of both the overall waste stream and what is received from different types of generators, such as residents of single-family homes and apartments, non-residential customers, and self-haulers. Separate analyses are conducted of the construction and demolition debris and organics waste streams.

The waste characterization studies are designed to provide a statistically valid picture of what is being disposed by the different generator types. Samples are taken over the course of a full year to account for seasonal variations. The sampling method is designed to ensure that all generator types and geographical areas are sufficiently sampled. The studies provide a high level of confidence of what is in the waste stream. Each study, described below, is conducted by the division as necessary to provide up-to-date information for planning purposes.

Solid Waste Characterization Studies

The most recent study of solid waste destined for Cedar Hills was conducted in 2015 (Cascadia 2015a). For this study, 421 samples were collected on 28 sampling days. The waste stream was separated into 97 categories of material. For each material and generator classification, the study was designed to achieve a 90 percent confidence interval for the amount of waste disposed countywide. In other words, the study tells us that we can be 90 percent sure that the amount of cardboard disposed in 2015 was 3.1 percent (26,112 tons) of the total waste stream, plus or minus 0.3 percent.

These waste characterization studies are not designed to characterize each city's waste stream. However, based on sampling done in a variety of communities, the types of materials disposed by residents are similar, while the amounts may differ. For example, jurisdictions with food waste collection programs will have lower percentages of food in their garbage than those without. These differences are reflected in the recycling rates and pounds disposed per household for each jurisdiction.

Garbage at the Bow Lake Recycling and Transfer Station

In-person surveys are also administered to customers bringing materials to transfer facilities (Cascadia 2015a). Customers are asked about the types of wastes they are bringing, the origin of those wastes, reasons for self-hauling (rather than using curbside collection services), how often waste is self-hauled, and willingness to separate out various recyclable materials. These surveys provide a better understanding of the customers who visit the stations and, in turn, provide the proper levels of service. The surveys are also useful in informing programmatic decisions.

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Customer satisfaction surveys are also conducted at the stations to evaluate the level of satisfaction with customer service and the disposal and recycling services provided at division facilities (Cascadia 2016). The division uses this information to monitor its performance and identify areas where improvements can be made.

Organics Characterization Studies

Curbside yard waste collection services throughout King County accept food waste (food scraps and food-soiled paper), and the division is now working to measure how much food waste is actually collected from residential sources. Reports from the collection companies provide information about total tons of organics delivered to compost facilities, but do not differentiate between yard waste tons and food scrap tons. The solid waste characterization studies described above measure decreases of food scraps and food-soiled paper in the waste stream, but not whether the decreases result from curbside collection or from other diversion, such as home composting.

To improve our ability to measure progress in organics recycling and establish achievable goals, the division is conducting periodic characterization studies of organics collected at the curb from single-family households. The division conducted its fourth organics waste characterization in 2017 (Cascadia 2017b) and plans to conduct studies every two to three years. The study looked at total organics generation, assessing how many food scraps were disposed in the organics cart and the garbage can. The division has started planning for discussions with stakeholders to ensure there is adequate organics processing capacity for the materials now being disposed to be processed more sustainably in the future.

Construction and Demolition Debris Characterization Studies

In 2001, the division began to conduct periodic characterization studies of construction and demolition debris disposed at select private facilities by commercial and self-haulers, as well as small quantities delivered to division transfer stations by self-haulers. The studies measure the composition of construction and demolition debris that continues to be disposed instead of recycled. Three studies have been conducted to date, with the last study completed in 2011 (Cascadia 2012a). Information from the waste composition studies helped to inform what materials would be designated as readily recyclable under the new construction and demolition debris recycling ordinance (see Chapter 4, *Sustainable Materials Management* for more information).

Planning Tools

To support overall system planning and determine appropriate rates, the division conducts focused studies to evaluate elements of the solid waste system and its operations, emerging technologies and industry challenges, and private-sector markets for recycling and reuse. The division will conduct additional planning studies as needed to explore a variety of topics including best practices in solid waste management, alternative disposal technologies, and sustainable financing.

Major studies used in development of the Plan are listed on the next page. Plans or studies approved by Council action are noted.

Plans and Studies

- *2001 Comprehensive Solid Waste Management Plan* (KCSWD 2002) - This is the last adopted plan. The 2001 Plan was approved by the King County Council in 2002.
- *Solid Waste Transfer and Waste Management Plan* (KCSWD 2006b) – Provides recommendations to guide the future of solid waste management, including the renovation of the urban transfer system and options for extending the life of the Cedar Hills Regional Landfill. The plan was approved by the King County Council in December 2007.
- *Final Environmental Impact Statement for the Cedar Hills Regional Landfill 2010 Site Development Plan* (KCSWD 2010a) – Identifies development alternatives for the landfill, outlines the environmental impacts of each alternative, and identifies potential mitigation measures, and recommends a preferred alternative.
- *Project Program Plan: Cedar Hills Regional Landfill 2010 Site Development Plan* (KCSWD 2010b) – Summarizes the preferred alternative for development of the landfill based on environmental review, operational feasibility, cost, stakeholder interest, and flexibility to further expand landfill capacity if future circumstances warrant. The plan was approved by the County Council in December 2010.
- *Solid Waste Transfer and Waste Management Plan Review* (KCSWD 2013) - The division conducted this review in response to a budget proviso in Ordinance 17619. The purpose of the review was to assess transfer station options and resulting impacts to cost, service and the environment. The recommendations helped inform changes to the plans for the Factoria, South County, and Northeast County recycling and transfer station projects.
- *DRAFT 2011 and 2013 Comprehensive Solid Waste Management Plan* (KCSWD 2013c). The draft updates of the 2001 Comprehensive Solid Waste Management Plan were used as the basis for this Plan update.
- *Sustainable Solid Waste Management Plan* (KCSWD 2014) - Evaluates operational and strategic planning options and provides recommendations on implementation approaches. The study focuses on five areas: resource recovery at division facilities; construction and demolition debris management; organics processing; disposal alternatives and technologies; and sustainable system financing.
- *Solid Waste Transfer and Waste Management Plan Review Part II* (KCSWD 2015) - In response to Council Motion 14145, the division, in collaboration with stakeholders, continued to evaluate a mix of capital facilities and operational approaches to address system needs over time, including potential demand management strategies (such as peak hour pricing or controlled access hours) that could motivate changes in how customers use transfer stations, thereby potentially reducing the need for added transfer station capacity in the northeast county.
- *Cedar Hills Site Development Alternatives Final Report, Volumes 1 and 2* (KCSWD 2017a) - Summarizes the options for continued development of the landfill based on operational feasibility, cost, stakeholder interest, and flexibility to further expand landfill capacity if future circumstances warrant.

Division staff review plan for centralized project management unit

- *Executive Proposed Solid Waste Disposal Fees 2017-2018* (KCSWD 2016c) – Rate study that examines four key inputs that determine solid waste disposal fees – financial assumptions, tonnage forecast, revenue and expenditures projections, and required target fund balance. Fees are calculated to ensure that revenues are sufficient to cover the costs of operations and services; funds are available for landfill closure and maintenance and capital investment projects for the transfer and disposal system; and a reserve Operating Fund balance is maintained. The 2017-2018 *Proposed Solid Waste Disposal Fees* were approved by the King County Council in September 2016.

- *Executive Proposed Solid Waste Disposal Fees 2019-2020* (KCSWD 2018b) - Rate study that examines four key inputs that determine solid waste disposal fees – financial assumptions, tonnage forecast, revenue and expenditures projections, and required target fund balance. Fees are calculated to ensure that revenues are sufficient to cover the costs of operations and services; funds are available for landfill closure and maintenance and capital investment projects for the transfer and disposal system; and a reserve Operating Fund balance is maintained. The 2019-2020 *Proposed Solid Waste Disposal Fees* were transmitted to the King County Council in July 2018.

Evaluation of Technologies

- *2006 Material Recovery Facility Assessment* (Cascadia 2006) – Provides an assessment of four materials recovery facilities where commingled recyclables collected at the curb are sorted and processed. The purpose was to quantify and characterize materials processed at the materials recovery facilities. Materials recovery facilities activity and capacity will continue to be tracked as necessary to monitor the need for improvements and to ensure there is processing capability for additional materials diverted from disposal in the future.

- *Comparative Evaluation of Waste Export and Conversion Technologies Disposal Options* (R.W. Beck 2007) – Provides a planning-level assessment and comparison of various solid waste conversion technologies and waste export.

- *Anaerobic Digestion Feasibility Study* (HDR 2017) – Assesses the viability of several different scenarios using anaerobic digestion to process organic materials collected in King County.

Cedar Hills Regional Landfill

- *King County Waste to Energy Study* (Normandeau 2017) – Evaluates waste-to-energy technologies and recommends the technology that best matches King County's circumstances.

Waste Prevention and Recycling Studies

- *Sustainable Curbside Collection Pilot* (KCSWD et al. 2008b) – Presents results of a pilot study to test the feasibility and public acceptance of every-other-week curbside garbage collection. Conducted in the City of Renton, the pilot study was performed in conjunction with Public Health – Seattle & King County and Waste Management, Inc. and was permanently implemented in 2009.

- *Greenhouse Gas Emissions in King County: An Updated Geographic-plus Inventory, a Consumption-based Inventory, and an Ongoing Tracking Framework* (King County 2012) - Presents results from two different, but complementary, inventories of GHG emissions associated with King County, Washington.
- *Optimized Transfer Station Recycling Feasibility Study* (KCSWD 2013) - Evaluates methods to optimize County resources being dedicated to recycling activities at division transfer facilities.
- *Waste Monitoring Program: Market Assessment for Recyclable Materials in King County* (Cascadia 2015a) – Helps identify opportunities and establish priorities for market development and increased diversion of recyclable materials from the waste stream. Data from the market assessment are used to guide the direction of future recycling programs and services recommended in this Plan.

Other Plans Considered

The Comprehensive Solid Waste Management Plan is just one component of regional planning for land use, development, and environmental protection in King County. The division considers plans developed by the state, the county, and the City of Seattle in its own planning process to ensure consistency with other planning efforts in the region. The following list was used in the development of this Plan; in future planning efforts, the division will refer to the newest version of these plans.

- *On the Path to Sustainability and 2011 Plan Amendment-Picking Up the Pace to Zero Waste* (City of Seattle 1998/2011) – The City of Seattle's solid waste management plan, including goals for recycling and waste prevention.
- *2010 Local Hazardous Waste Management Plan Update* (Watson et al. 2010) – Presents plans for managing hazardous wastes produced in small quantities by households and businesses and for preventing these wastes from entering the solid waste stream.
- *The State Solid and Hazardous Waste Plan: Moving Washington Beyond Waste and Toxics* 2015 Update (Ecology 2015) – Presents the state's long-term strategy for systematically eliminating wastes and the use of toxic substances. The plan includes initiatives that focus on expanding the recycling of organic materials and advancing green building practices.
- *King County Strategic Plan* (King County 2015a) – Presents countywide goals for setting high standards of customer service and performance, building regional partnerships, stabilizing the long-term budget, and working together as one county to create a growing economy and sustainable communities. This Plan supports each of the primary goals of the King County Strategic Plan, with particular emphasis on environmental sustainability and service excellence.

Division staff conducting sampling

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- *Strategic Climate Action Plan* (King County 2015b) – Synthesizes King County's most critical goals, objectives, strategies and priority actions to reduce greenhouse gas emissions and prepare for the effects of climate change. It provides a single resource for information about King County's climate efforts.
- *2016 King County Comprehensive Plan (2016 Update)* (King County 2016a) – The guiding policy document for all land use and development regulations in unincorporated King County, as well as for establishing the establishment of Urban Growth Area boundaries and regional services throughout the county, including transit, sewers, parks, trails, and open space. Updates to the 2016 plan were adopted by the County Council in December, 2016.
- *King County Equity and Social Justice Strategic Plan 2016-2022* (King County 2016b) - The county's blueprint for change that will guide policies and decision-making, design and delivery of services, and workplace practices in order to advance equity.

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Sustainable Materials Management

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Policies

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Goal Achieve Zero Waste of Resources – to eliminate the disposal of materials with economic value – by 2030, with an interim goal of 70 percent recycling through a combination of efforts in the following order of priority:

a. Waste prevention and reuse,
b. Product stewardship,
c. Recycling and composting, and
d. Beneficial use.

S-1 Set achievable targets for reducing waste generation and disposal and increasing recycling and reuse.

S-2 Enhance, develop, and implement waste prevention and recycling programs that will increase waste diversion from disposal using a combination of tools:

a. Infrastructure,
b. Education and promotion,
c. Incentives,
d. Mandates,
e. Enforcement, and
f. Partnerships.

S-3 Advocate for product stewardship in the design and management of manufactured products and greater responsibility for manufacturers to divert these products from the waste stream.

S-4 Prevent waste generation by focusing on upstream activities, including encouraging sustainable consumption behaviors, such as buying only what one needs, buying durable, buying secondhand, sharing, reusing, repairing, and repurposing.

S-5 Work with regional partners to find the highest value end uses for recycled and composted materials, support market development, and develop circular supply loops to serve production needs.

S-6 Strive to ensure that materials diverted from the King County waste stream for recycling, composting, and reuse are handled and processed using methods that are protective of human health and the environment.

Policies

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S-7 Provide for efficient collection of solid waste, recyclables, and organics, while protecting public health and the environment, promoting equitable service, and maximizing the diversion of recyclables and organics from disposal.

S-8 Promote efficient collection and processing systems that work together to minimize contamination and residual waste, maximize diversion from disposal, and provide adequate capacity.

Summary of Recommended Actions

The following table includes a menu of recommended actions that the county and the cities should implement. Under the responsibility column, the entity listed first has primary responsibility for the action, bold indicates that the entity has responsibility for the action, and a star (*) indicates that the action is a priority. If the responsibility is not in bold, the action has lower implementation priority.

Action Number and Responsibility	Action	Detailed Discussion
	Regional Leadership	
1-s Cities, county	Lead by example by improving waste prevention and recycling in public-sector operations, facilities, and at sponsored events, as well as through the purchase of sustainable products.	Page 4-7
2-s County, cities, collection companies*	Form a regional responsible recycling forum to work with public and private partners to address production, use, and end-of-life management of goods. The forum will identify ways to strengthen recyclables markets, reduce contamination, and improve the quality and quantity of recyclable materials through more uniform city/county recycling approaches, education and outreach, and other means.	Page 4-15
	Education, Outreach and Technical Assistance	
3-s County, cities, and other stakeholders*	Provide regional education outreach support and incentive programs to overcome barriers for residents and businesses to effectively prevent waste. Emphasize the primary importance of purchase and product use decisions that prevent waste, and secondary importance of recycling items/materials that couldn't be prevented. Work in partnership with other governments, non-governmental organizations, and the private sector to maximize the effectiveness of these efforts.	Page 4-8
4-s County	Provide waste prevention and recycling education programs in schools throughout the county, and help schools and school districts establish, maintain, and improve the programs.	Page 4-11
5-s Cities, county, collection companies	Continue to educate customers on proper recycling techniques to reduce contamination of recyclables and organic feedstocks going to the materials recovery facilities and compost facilities.	Page 4-8

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Summary of Recommended Actions

Action Number and Responsibility	Action	Detailed Discussion
6-s Cities, county*	Increase educational outreach and promotion to single-family, multi-family, and non-residential customers to encourage recycling and reduce waste.	Page 4-19
7-s County, cities	Increase single-family food scrap recycling through a three-year educational cart tagging program.	Page 4-16
8-s Cities, county*	Continue to develop infrastructure and increase regional and local educational outreach, incentives and promotion to increase recycling of food scraps and food-soiled paper. These efforts should target single-family and multi-family residential developments, as well as non-residential buildings such as schools, institutions, and businesses.	Page 4-16
9-s County	Provide information and technical assistance to external agencies, such as local governments, schools, colleges, and other public and private organizations to increase their purchase of sustainable products. Support implementation of the county's Sustainable Purchasing Policy through waste reduction, recycling, use of recyclable products, and green building.	Page 4-20
	Policy and Infrastructure	
10-s County*	Work with public and private partners to support the development of reuse and recycling value chains, including markets, for target products and materials. Employ incentives and material-specific projects that reduce or eliminate barriers to reuse and recycling.	Page 4-18
11-s County*	Pursue product stewardship strategies through a combination of voluntary and mandatory programs for products that contain toxic materials, are difficult and expensive to manage, and/or need sustainable financing, including, but not limited to, paint, carpet, fluorescent bulbs and tubes, mercury thermostats, batteries, unwanted medicine, mattresses, e-waste, paper and packaging, plastic bags and film, and sharps. Strategies may include Right to Repair legislation and framework legislation for addressing producer responsibility.	Page 4-12
12-s County	Explore options to increase recycling and resource recovery through innovative methods and technologies.	Page 4-15 and 6-3

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Summary of Recommended Actions

Action Number and Responsibility	Action	Detailed Discussion
13-s County, cities	Assess and develop options if selected actions are not enough to achieve an overall 70 percent recycling rate.	Page 4-3
14-s Cities, county	Reduce consumer use of common single-use items – for example, promote reusable shopping and produce bags.	Page 4-10
15-s County, cities	Work with food producers, grocers, restaurants, and schools to prevent food waste and to increase food recovery through donation of surplus meals and staple food items to local food banks.	Page 4-11
16-s County, cities	Develop a process and criteria to amend the designated recyclables list if conditions warrant adding or removing recyclables.	Page 4-13
	Measurement	
17-s County	Use the following targets to measure the progress toward the goal of zero waste of resources: 1. Generation rate target: • Per capita: 20.4 pounds/week by 2030, and • Per employee: 42.2 pounds/week by 2030. 2. Recycling rate target: Interim goal of 70 percent. 3. Disposal rate target: • Per capita: 5.1 pounds/week by 2030, and • Per employee: 4.1 pounds/week by 2030. These targets should be evaluated at least every three years when data becomes available from the waste monitoring studies.	Page 4-5
18-s County	Develop a target for reducing greenhouse gas emissions from disposed waste by 2030, with 2007 emissions used as a baseline for comparison.	Page 4-12

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Summary of Recommended Actions

Action Number and Responsibility	Action	Detailed Discussion
	Grants	
19-s County	Continue to support the cities' implementation of the Plan through the county waste reduction and recycling grant program and allocation of Local Solid Waste Financial Assistance funds from the Washington State Department of Ecology. The county should strive to maintain the level of funding to cities, increasing waste reduction and recycling grant amounts as Local Solid Waste Financial Assistance funding decreases; and should revise or amend grant criteria to reflect priority Comprehensive Plan actions.	Page 4-19
20-s County	Work collaboratively with cities and other stakeholders to develop a new competitive grant program funded from the tip fee that would be available to private entities, non-profits, and cities to support innovative programs that help meet plan goals.	Page 4-20
21-s Cities, county	Evaluate options to transition away from recycling collection events as enhanced recycling services are provided at renovated transfer stations, improved bulky item collection becomes available and cost effective curbside, and product stewardship programs emerge.	Page 4-19
22-s County, cities	Develop a list of effective waste prevention and recycling efforts that can be implemented using existing and new grant funds.	Page 4-19
	Green Building	
23-s Cities, county	Adopt green building policies and regulations that support the design of buildings and structures that are carbon neutral, are energy efficient, and use recycled materials.	Page 4-1
24-s County	Assist cities in developing green building policies and practices; encourage green building through Leadership in Energy and Environmental Design™ (LEED®), Built Green™, Living Building Challenge, and other certification programs.	Page 4-32
25-s County	Provide technical assistance and promote proper deconstruction, building reuse, and reuse of building materials.	Page 4-35

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Summary of Recommended Actions

Action Number and Responsibility	Action	Detailed Discussion
	Construction and Demolition Materials Recycling	
26-s County, cities*	Work collaboratively with cities to implement building codes that require compliance with construction and demolition debris recycling and handling requirements contained in county code. The county will provide outreach/promotion for city permitting and enforcement staff.	Page 4-35
27-s County	Continue to explore options to increase the diversion of construction and demolition debris from disposal in the landfill, particularly for wood, metal, cardboard, asphalt shingles, carpet, and gypsum wallboard.	Page 4-35
28-s County*	Increase regional recycling of construction and demolition materials through education and enforcement of construction and demolition debris recycling requirements.	Page 4-35
29-s County*	Ensure that construction and demolition debris is managed in an environmentally sound manner by privately owned landfills via enforcement of construction and demolition debris handling requirements contained in county code.	Page 4-35
	Collection	
30-s County, UTC	Involve the Vashon/Maury Island community and service providers to develop the appropriate type of recycling services provided curbside and at the transfer station. Include Vashon in the county's collection service standards for curbside services.	Page 4-21
31-s Cities, county	Explore options to increase the efficiency and reduce the price of curbside and multi-family collection of bulky items, while diverting as many items as possible for reuse or recycling.	Page 4-28
32-s Cities, county*	Adopt the single and multi-family minimum collection standards.	Page 4-30 & 4-31

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Summary of Recommended Actions

Action Number and Responsibility	Action	Detailed Discussion
33-s County, UTC	Consider improvements to single-family collection services in the unincorporated area to increase the recycling rate.	Page 4-29
34-s Cities	Include non-residential recycling services in city contracts (consistent with state law).	Page 4-33
35-s Cities	Consider implementing an incentive-based rate structure for non-residential garbage customers to encourage recycling.	Page 4-33
36-s County, cities	Update and enforce building code requirements to ensure adequate and conveniently located space for garbage, recycling, and organics collection containers in multi-family, commercial, and mixed-use buildings.	Page 4-30
37-s County, cities	Make recycling at multi-family complexes convenient by implementing best practices.	Page 4-30

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Sustainable Materials Management

In 1989, the state adopted the Waste Not Washington Act, making waste prevention and recycling the preferred method of managing solid waste and requiring jurisdictions to provide curbside recycling services to all residents living in urban areas. In King County, the division, cities, Washington Utilities and Transportation Commission (UTC), and solid waste collection companies worked together to launch a coordinated system for curbside collection of recyclables throughout the region. Working together over the last almost 30 years, both the public and private sectors have taken the region well beyond curbside recycling by creating myriad programs and services that foster the recycling and reuse of materials that might otherwise be thrown away and, more importantly, that prevent waste from being created in the first place.

Since the *2001 Comprehensive Solid Waste Management Plan* was adopted, the collection system in the region has evolved significantly. The number of materials that can be recycled or processed for recycling and reuse has increased, technologies for collecting materials have improved, and participation in curbside recycling has continued to climb. Along with the growth of recycling in the region, however, comes issues that could potentially impact how much and what materials are recycled. Since inception of the waste reduction and recycling programs, markets and processing capacity for materials have fluctuated. Recent issues such as China's restrictions on multiple materials markets, contamination of recyclables and organics, and almost reaching local capacity to process organic materials, are testing the system's resilience. Working through these challenges with the cities and local haulers and processors will ultimately strengthen recycling, collection and processing in the region.

Two key developments have added to the increase of materials collected in single-family residential curbside recycling in the region. First is the transition to commingled (or single-stream) collection. Since 2001, the collection companies have transitioned to commingled recycling, whereby all the recyclable materials are placed in one large cart for curbside pickup.

A second development is the addition of food scraps and food-soiled paper to yardwaste collected curbside. In 2001, the division began working with cities and collection companies to phase in curbside collection of food scraps and food-soiled paper in the yard waste (organics) cart. Compostable food scraps and food-soiled paper, which currently make up about one-third of the waste disposed by single-family residents, include all fruit, vegetable, meat, dairy products, pastas, grains, breads, and soiled paper used in food preparation or handling (such as paper towels). Food and yard waste, either separated or commingled, are referred to as organics. Nearly 100 percent of single-family customers who subscribe to garbage collection now have access to curbside food scrap collection. Only Vashon Island and the Skykomish and Snoqualmie Pass areas, which house less than one percent of the county's residents, do not have this service.

Food scraps can be collected in small containers lined with compostable bags to make it easier to recycle

In addition to these major developments, programs such as Leadership in Energy and Environmental Design™ and Built Green™ are encouraging the building community to focus on waste prevention, recycling, and reuse of construction and demolition debris and helping to stimulate markets for the recycling and reuse of construction and demolition materials.

In the 1980s, projections indicated that with the growing population and economy in the region, the amount of garbage that residents of King County would throw away would continue to climb steeply. Through the efforts of the county and area cities, businesses, and individual citizens, the amount of garbage disposed per resident per week dropped from 35 pounds in the 1980s to 15.2 pounds in 2014–a reduction of almost 57 percent. This reduction in disposal has contributed to extending the life of the Cedar Hills Regional Landfill (Cedar Hills) by more than 20 years.

Yet even with the increased recycling and waste prevention seen over the years, recent waste characterization studies conducted by the division indicate that about 70 percent of all materials disposed in the landfill are resources that could have been recycled or reused. As discussed in this chapter, identifying what these materials are and who generates them can help us determine where future efforts should be focused to achieve ongoing improvements.

Concentrating efforts on a particular class of waste generator (e.g., residential or business) or commodity type can yield measurable results. Four categories of information, discussed in detail herein, can be used to evaluate the current status of waste prevention and recycling efforts and help develop strategies that will lead to future improvements:

1. Waste prevention programs achieving results in the region.

2. Recycling and disposal rates by type of waste generator (discussed in Chapter 3, *Forecast and Data*), including:
   - Single-family (up to 4 units) and multi-family residents (in some cities may include townhomes),
   - Non-residential generators, such as businesses, institutions, and government entities,
   - Self-haulers, both residents and businesses, who bring materials to division transfer facilities, and
   - Generators of construction and demolition debris.

3. Types and quantities of recyclable or reusable commodities that remain in the waste stream, such as food scraps, clean wood, metals, and paper.

4. The status of markets for recyclable materials, availability of take-back options for used products, and opportunities to partner with private-sector businesses, national coalitions, and other jurisdictions to effect change.

Information from these four categories was used to shape the goals and recommended actions presented in this chapter. To set the stage, this chapter begins with a description of the benefits of recycling and a discussion of our regional goals for the future. From there the focus moves to ways to sustain the momentum by looking at additional waste prevention, resource conservation, recycling, and product stewardship opportunities. The chapter concludes with a discussion of the status and challenges of collection by customer type.

Benefits of Recycling Efforts

The regional commitment to recycling has many benefits–financial, social, and environmental. Financial benefits are probably the most immediate for many county residents and businesses. Convenient recycling services not only provide an alternative to the higher cost of disposal, but also provide a long-term significant cost savings for ratepayers by increasing the lifespan of Cedar Hills. As discussed in Chapter 6, *Landfill Management and Solid Waste Disposal*, Cedar Hills landfill is a more cost-effective means of disposal than the other disposal alternatives currently

available. After Cedar Hills reaches capacity and closes, minimizing the amount of waste that requires disposal will translate directly into lower fees for King County ratepayers.

The social benefits of recycling can be described in terms of economic growth and job creation. Materials diverted from Cedar Hills for recycling must be sorted, processed, and transported. The 2016 Recycling Economic Information (REI) Report (EPA, 2016) includes information about the recycling jobs, wages, and tax revenue benefits. The report shows that recycling and reuse of materials creates jobs, while also generating local and state tax revenues. In 2007, recycling and reuse activities in the United States accounted for:

- 757,000 jobs,
- $36.6 billion in wages, and
- $6.7 billion in tax revenues.

This equates to 1.57 jobs for every 1,000 tons of materials recycled. Construction and demolition debris recycling provides the largest contribution to all three categories (job, wage, and tax revenue), followed by ferrous metals and non-ferrous metals such as aluminum.

The Recology Store is a place to both recycle items and to purchase items made from recycled materials (Photo courtesy of Recology CleanScapes)

The positive environmental benefits of recycling are local and ultimately global. Environmental benefits are focused in two primary areas, both of which have wide-reaching and long-term impacts. First, the release of pollutants emitted during the production and disposal of products is decreased, reducing the potential for harm to human health and the environment. Second, savings in energy use and associated reduced greenhouse gas emissions will result from decreased demand to process virgin materials into products, which also contributes to a healthier planet. Figure 4-1 illustrates a circular supply loop. The figure graphically shows the opportunities, values, and benefits of organics recycling in King County.

Goal and Targets

The goal and targets for waste prevention and recycling were established through extensive discussions with the division's advisory committees: the Solid Waste Advisory Committee (SWAC) and the Metropolitan Solid Waste Management Advisory Committee (MSWMAC). The countywide goal and targets are intended to improve the effectiveness of established waste prevention and recycling efforts. The recommended actions for implementation presented at the beginning of this chapter were developed to provide general strategies for meeting the goal and targets and to identify the agency or agencies that would lead those efforts. The recommended actions are intended to serve as a guideline for the county and cities. They do not preclude other innovative approaches that may be implemented to help achieve the goal and targets.

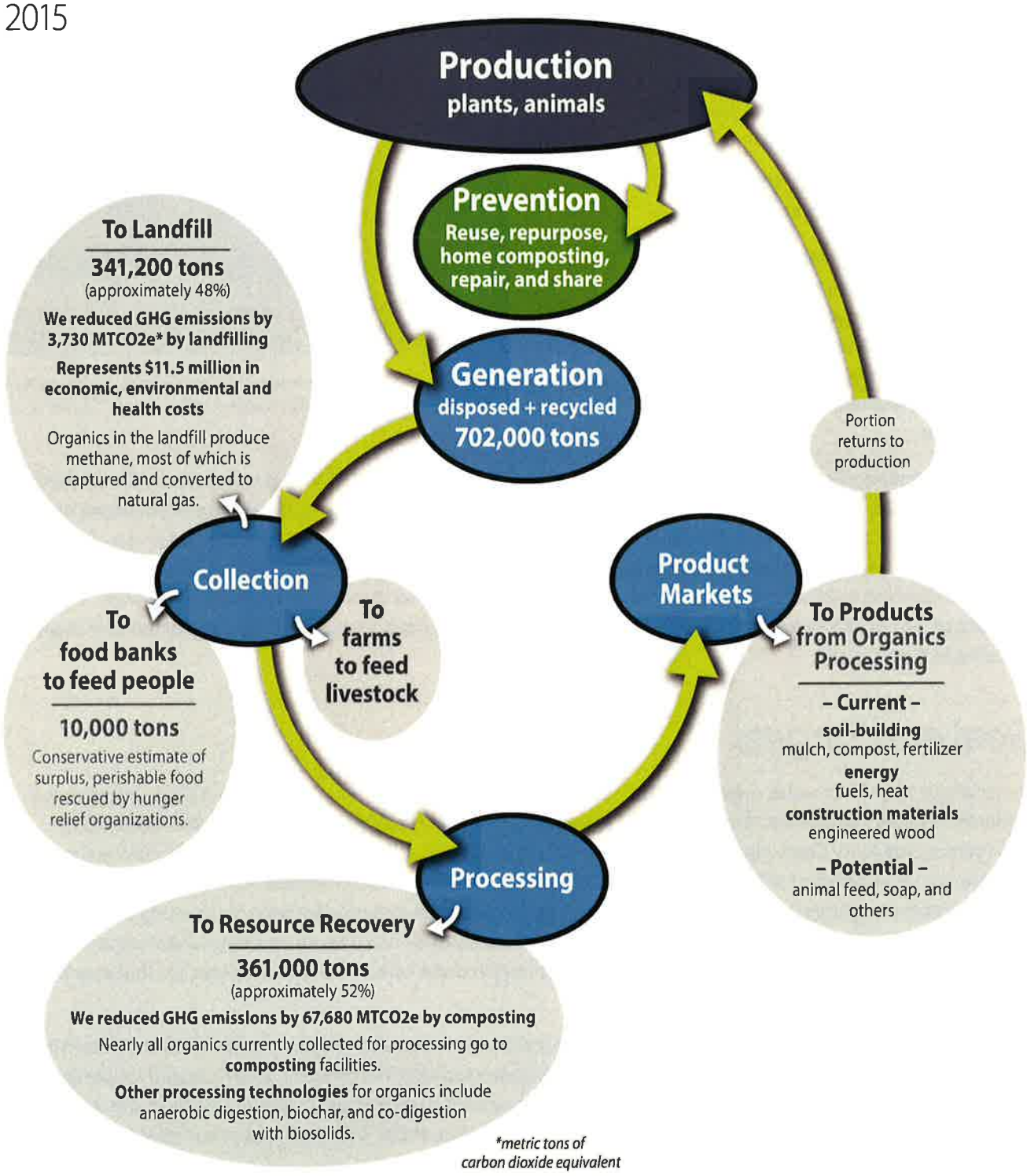
Factors other than waste prevention and recycling programs and services can increase or decrease the overall amount of waste generated. For example, the 2007 economic recession resulted in significant, unanticipated reductions in garbage collected, stemming primarily from the drop in consumer spending and business activity in the region. When establishing the goal and targets and measuring success in meeting them, it is important to consider the economy, policy changes, and other factors that may be in play.

Figure 4-1 Organics: Opportunities, values, and benefits in King County

Food, yard, and wood wastes: Opportunities, values, and benefits in King County

2015

Organics recycling retains useful materials in the economy, creates new job opportunities, converts a would-be waste into beneficial, marketable products for farmers and gardeners, reduces the need for petroleum-based chemicals and fertilizers, improves nutrient recycling, and reduces the impacts from disposal.



Waste Prevention and Recycling Goal and Targets

Overall Waste Prevention and Recycling Goal

Achieve Zero Waste of Resources – i.e., eliminate the disposal of materials with economic value – by 2030 through a combination of efforts in the following order of priority: waste prevention and reuse; product stewardship, recycling, and composting, and beneficial use.

Waste generation rates to be achieved by 2030

Per Capita – 20.4 pounds/week
This target addresses residential waste from single- and multi-family homes.

Per Employee – 42.2 pounds/week
This target addresses waste from the non-residential sector.

Waste Disposal Targets to be achieved by 2030

Reductions in disposal over time indicate an increase in waste prevention and/or recycling.
Per Capita – 5.1 pounds/week
This target addresses residential waste from both single- and multi-family homes.

Per Employee – 4.1 pounds/week
This target addresses waste from the non-residential sector.

Waste Prevention Targets

Establishing waste prevention targets and measuring success in achieving them is a challenge, because data quantifying the amount of waste not generated is difficult to obtain. However, by tracking overall waste generation (tons of material disposed + tons recycled) over the years, King County can attempt to identify regional trends in waste prevention. A decline in waste generation means that the overall amount of materials disposed or recycled, or both, has been reduced. The county also uses data from reuse and repair, building salvage, commercial food waste prevention grants, catalog/junk mail/phone book opt-outs, and material efficiencies spurred by product stewardship, to help determine whether waste prevention progress is being made.

Recycling Target

Recycling will continue to be an important strategy to reduce the disposal of solid waste. The recycling goal combines single-family, multi-family, non-residential, and self-haul recycling activity. It addresses the amount of waste being diverted from disposal at the Cedar Hills Regional Landfill to recycling. It does not include construction and demolition debris (which have separate recycling goals), or other wastes, such as car bodies, which are not typically handled through the county system. In 2015, the overall recycling rate for the county was 54 percent.

The goal for this planning period reflects the estimated recycling rate achievable if the recommended strategies in this plan are fully implemented (see Figure 4-3).

Overall interim recycling goal: 70 percent

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What is Your Recycling Rate? It Depends on What You Count.

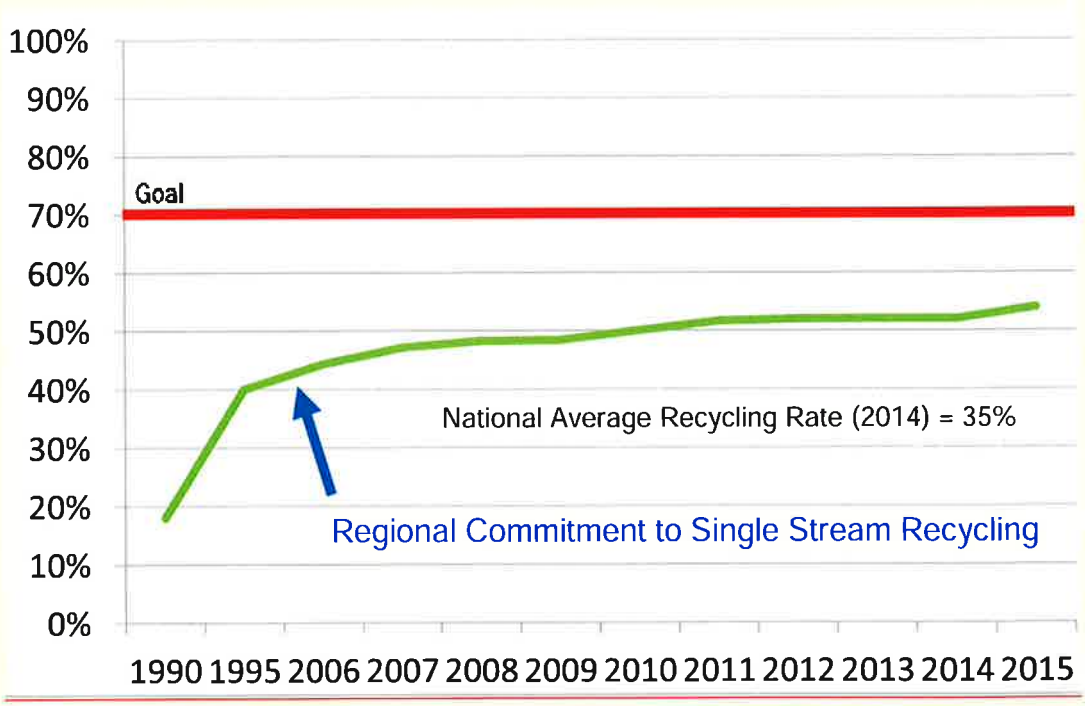
Currently, there are no state or national standards for what should be counted in the "recycling rate" for a city or county. As a result, recycling rates reported by various jurisdictions may include different materials. For example, the recycling rate reported by some jurisdictions includes many materials that are not managed as a part of the county's system, so they are not included in establishing the county's recycling rate. This includes construction and demolition debris, asphalt and concrete, auto bodies, and biosolids. Many of these materials are very heavy and can considerably increase a recycling rate based on tons. In addition, some jurisdictions add percentage points to their recycling rate to account for the estimated success of their waste prevention efforts.

The division has chosen to calculate King County's recycling rate based on the known amount of materials diverted from disposal at the Cedar Hills Regional Landfill. As such, it does not include materials such as construction and demolition debris or car bodies that are handled largely by the private sector. Neither does the division include any estimate of waste prevention, primarily because of the lack of measurable data.

For example, based on the definition above, the county's recycling rate in 2014 was 52 percent. Adding recycled asphalt and concrete would raise the calculated rate to approximately 62 percent. The rate would have been higher still if hard-to-measure materials such as car bodies and land clearing debris were added.

Given the various methods for calculating a recycling rate, it is important to understand what materials are being counted before comparing rates across jurisdictions.

Figure 4-2. Recycling rate over time



As can be seen in Figure 4-2, the recycling rate has stalled, even as waste generation has increased in recent years. The role of individual cities will be critical in reaching our countywide waste prevention and recycling goal and targets. The way in which each city contributes to the overall goal and targets, however, may vary depending on the city's demographic make-up and other factors. For example, a city with a large concentration of apartments and condominiums might focus more efforts on programs for multi-family residents. Communities with primarily single-family homes might focus education and promotion on food scrap recycling for their residents.

Westwood Help Stop Food Waste campaign

Another factor cities may consider is the make-up of their business (or non-residential) sectors. Cities with many restaurants, grocers, or other food-related businesses might look at ways to promote the recycling of food scraps or to partner these businesses with local food banks to donate surplus food to those in need. Similarly, cities with booming construction activity may want to take advantage of markets for the recycling and reuse of construction and demolition materials.

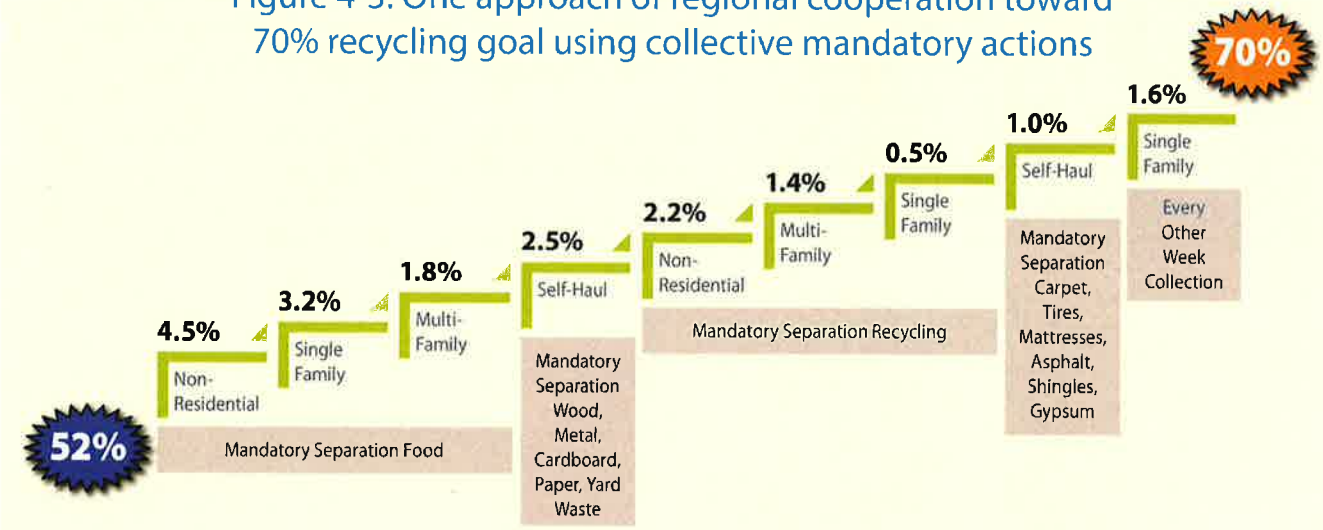
Likewise, the county will consider the make-up of the unincorporated area in which to focus waste prevention and recycling efforts.

The county and the cities lead by example to improve waste prevention and recycling in their respective operations, at their facilities, and at sponsored events, for instance:

- Some cities have held their own zero waste events and picnics,
- The county and many cities collect food scraps and food-soiled paper at their offices and associated sites, and
- The county enacted an ordinance to purchase copy paper that is 100 percent recycled content and reduce paper use by 20 percent.

Figure 4-3 provides an example of how the region could reach a 70 percent recycling goal by collectively implementing mandatory recycling programs.

Figure 4-3. One approach of regional cooperation toward 70% recycling goal using collective mandatory actions



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Tools Used to Meet the Recommended Goal and Targets

The division and the cities have various tools at their disposal to promote waste prevention and increase recycling. Table 4-1 below identifies these tools and cites some of the successes achieved through their use.

Table 4-1. Examples of successes achieved using various tools

Tool	Application	Successes
Infrastructure	Establishing the collection and processing infrastructure is always the first step. It can be accomplished through enhanced curbside collection services, additional recycling options at transfer facilities, and partnerships with private-sector processing facilities and manufacturers/retailers, e.g., to develop take-back programs.	New transfer facilities are being designed with dedicated areas for recyclable materials such as yard waste, clean wood, and scrap metal. Approximately 99 percent of single-family curbside collection customers have access to collection service for food scraps and food-soiled paper, along with the yard waste. Through E-Cycle Washington electronics manufacturers have developed a statewide network of locations for recycling televisions, computers, and monitors. Likewise LightRecycle Washington established a network to collect mercury-containing lights.
Education and promotion	Educational programs and targeted advertising play a key role in initiating new programs and sustaining the momentum of existing programs. These efforts can be tailored to specific waste generators or materials.	The division's Green Tools team provides education, resources, and technical assistance on how to manage construction and demolition debris as a resource rather than a waste. Many cities provide assistance to businesses to establish and maintain recycling programs. EnviroStars Green Business Program is a free program that offers rebates, resources, and incentives to businesses who take action to protect the environment and employee health and safety. Bellevue, Kirkland and King County are founding members.
Incentives	Incentives encourage recycling. For example, in a pay-as-you-throw (or variable rate) type program, if a customer generates less garbage, they need a smaller garbage container, which means a lower charge on their garbage bill. Incentives can also take the form of a give-away item that makes waste prevention and recycling easier.	To encourage waste prevention and recycling, curbside garbage collection fees increase with the size of garbage can that customers subscribe to creating a "pay as you throw" (or variable rate) system. In addition, embedding recycling in the rate can also act as an incentive. Some cities provide kitchen containers and sample compostable bags to encourage residents to recycle their food scraps.

Tool	Application	Successes
Mandates	Mandates that restrict the disposal of specific materials have proven effective in increasing recycling, particularly in instances where there is a viable and developed recycling market for those materials. Mandates can be legislated at the local, state, or federal level, or implemented through city contracts.	In order to discourage disposal of yard waste, its disposal in curbside garbage has been prohibited since 1993. In 2005, fluorescent lights and many electronics were prohibited from disposal at King County transfer stations to encourage the recycling of these items and use of the Take It Back Network *http://www.kingcounty.gov/depts/dnrp/solid-waste/programs/take-it-back.aspx.* To increase recycling, the division requires self-haulers to separate their materials at county transfer stations. Starting in 2018, cardboard, metal, yard waste, and clean wood is banned from disposal at transfer stations that provide recycling services for these materials.
Enforcement	Enforcement of program rules ensures that materials are recycled or disposed of properly.	The construction and demolition debris program employs a King County sheriff to enforce the recycling and disposal rules for construction and demolition materials. Outreach and progressive fines are issued to violators to encourage them to learn how the materials should be handled.
Partnerships	Partnerships enable a program to be amplified by bringing in other organizations or agencies to assist with the program	Product stewardship efforts rely on partnerships to implement programs. The division routinely partners with other organizations to further product stewardship goals through the Northwest Product Stewardship Council.

The successful diversion of residential yard waste from disposal exemplifies the effective use of four of these tools. First, an ***infrastructure*** was created to make it easy to separate yard waste from garbage. Curbside collection programs were implemented in phases across the county, easy-to-use wheeled collection containers were provided to residents, and private-sector businesses began turning the collected yard waste into compost for building healthy soils.

Promotions were used to inform residents of the availability of curbside collection as the service was phased in. ***Educational*** campaigns were launched to teach citizens how to compost yard waste from their own yards for use as a soil amendment. Because the cost of collecting yard waste for composting was less than the cost of disposal in the garbage, residents had an ***incentive*** to subscribe to yard waste collection service. Many cities provided an additional

Food: Too Good to Waste campaign shares information with consumers about how to purchase and store food to minimize waste

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incentive by including yard waste collection as part of their basic package of collection services at the curb. Finally, ***mandates*** were passed by the cities and the county to prohibit residents from disposing of yard waste in the garbage wherever separate curbside yard waste collection was available. The resulting collection system for yard waste successfully recycled almost 96 percent of the yard waste disposed by single-family residents in 2015.

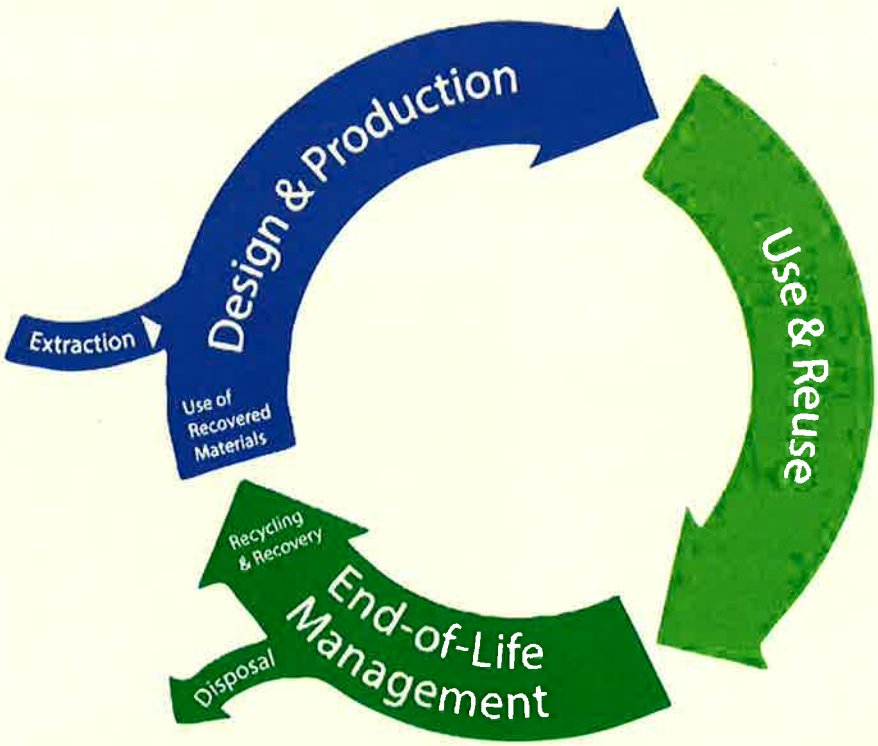
Taking a Sustainable Materials Management Approach

The following discussion describes a different way to look at the waste prevention and recycling programs and activities already in place. It describes the advantages of a sustainable materials management approach that encompasses the full life-cycle of materials: design and manufacturing, use and reuse, and end-of-life.

Figure 4-4 graphically depicts the sustainable materials management approach. This approach has been adopted by the U.S. Environmental Protection Agency (EPA) as well as the Washington State Department of Ecology in the last update of the state solid waste plan (Ecology 2015). Sustainable materials management still focuses on recycling and disposal, but by including production, design, use, and reuse, it provides an opportunity to identify more resilient, sustainable ways to design products that prioritize durability and recyclability, and use less energy, water, and toxics.

Figure 4-4. Materials life cycle

Source: Moving Washington Beyond Waste and Toxics, 2015



Decisions to reduce waste can be made at several critical stages in a product's life cycle, helping to develop a circular supply loop:

- When manufacturers decide what goods to produce, how to design them, how to produce them, and how to package them,
- When consumers decide whether and what to purchase, and
- When consumers adopt ways to use and reuse products more efficiently.

The following sections provide examples of programs in the different phases of sustainable materials management.

Design and Production

Food: Too Good to Waste – This program educates consumers on ways to prevent wasting food. When food is wasted, it also wastes all the water and energy used to produce, package and transport it from the farm to table. In addition, about 33 percent of the single-family garbage disposed at Cedar Hills is food, which significantly reduces landfill capacity and life.

Green Schools Food Waste Reduction and Food Share - The King County Green Schools Program assists schools and school districts to reduce wasted food through a number of strategies:

- Encourage students to take what they will eat and eat what they take,
- Set up cafeteria share tables on which students may place or take unopened, packaged foods and drinks from the school lunch program, and
- Donate unopened, packaged items and uneaten whole fruits that cannot be re-served to students.

The goals of the School Food Share program are to minimize wasted foods and beverages and safely distribute unwanted items from school lunch programs to local food banks and meal programs.

Use and Reuse

Threadcycle is a public education campaign sponsored by King County and Seattle Public Utilities that encourages residents to donate used clothing, shoes, and linens for reuse or recycling. Local thrift stores and other organizations are partners in the program and will take all clothing, shoes, and linens regardless of condition (except items that are wet, mildewed, or contaminated with hazardous materials).

Repair Group event provides an opportunity for residents to bring in broken items for repair

The EcoConsumer public outreach program sponsors **Repair Groups** and events. Each repair event or group operates differently, based on the needs of the local community. It might be a one-time event, or they may be held every few months. People can bring to these events household items including small furniture, small appliances, personal electronics, and clothing that need to be repaired. Experienced all-purpose fixers and sewing fixers will work on the items, and can also help residents to learn to do their own repair.

Waste Prevention, Recycling and Climate Change

The purchase, use, and disposal of goods and services by King County residents, businesses, and governments are associated with significant greenhouse gas (GHG) emissions. Emissions can occur at all stages of a product's life – from resource extraction, farming, manufacturing, processing, transportation, sale, use, and disposal. In 2008, consumption-related GHG emissions in King County totaled more than 55 million metric tons of carbon dioxide equivalents (MTCO2e) – more than double the emissions produced within the county's geographic boundaries (King County 2012).

As a major employer and service provider in the region, King County government is also a major consumer of goods and services. These goods and services – especially construction-related services – account for 270,000 MTCO2e, or about 42 percent of the County's operations-related GHG emissions (King County 2012).

Residents, businesses, and governments can reduce GHG emissions associated with goods and services by choosing sustainable options, reducing the amount they purchase, reusing and repairing goods when possible, and recycling after use. King County is involved in these efforts through the solid waste management services and procurement efforts that the county provides, as well as through the county's efforts to educate residents and businesses about ways to use less and recycle more. The county is also taking a number of steps to reduce the environmental footprint of the products used in government operations and to reuse previously wasted resources.

Recycling outreach – The Solid Waste Division's Recycle More – It's Easy to Do campaign promotes basic recycling of curbside materials, food scraps and yard waste. Other programs that support increased recycling and waste prevention include the Green Schools Program, which supports conservation in schools.

Recycling infrastructure – In King County in 2010, about 832,000 tons of recyclable materials were collected by private hauling companies at the curb and about 10,000 tons were collected at King County transfer stations. Turning this waste into resources resulted in the reduction of approximately 1.6 million MTCO2e of GHG emissions.

Reusing resources – King County is helping develop, expand, and support markets for reused and recycled products. The LinkUp program has expanded markets for recyclable and reusable materials such as asphalt shingles, mattresses, and textiles. The EcoConsumer program has expanded reuse by promoting and supporting tool lending library projects in the county.

End-of-Life Management

Product stewardship is a life-cycle approach that is being implemented at the state, national and international levels. In practice, the product manufacturers – not government or ratepayers – take responsibility for their products "cradle to cradle." This means that manufacturers are given the authority to finance and provide for the collection, recycling and/or proper management of their products at the end of the product's life cycle.

The division is on the steering committee of the Northwest Product Stewardship Council (NWPSC) and has been participating in the development of product stewardship strategies for commodities that contain toxic materials or are difficult and expensive to manage, such as paint, carpet, mercury thermostats, rechargeable batteries, mattresses, junk mail, and telephone books.

The division and NWPSC were instrumental in getting state legislation adopted to implement the E-Cycle Washington and LightRecycle Washington extended producer responsibility programs. Both programs provide drop-off sites for consumers to take their electronics and mercury-containing lights. The division also worked to get a secure medicine return program implemented in King County. The program started in February 2017, and has approximately 100 locations where residents can securely dispose of unused medications.

What do I do with...? Hundreds of thousands of visitors use this application annually to find recycling, reuse, and disposal options. Businesses and organizations maintain their listing of the materials and products they recycle, reuse, or dispose of as a requirement of being included as a partner on this high traffic division website. One of the oldest recycling databases in the country, What do I do with...? has evolved over almost twenty years from a printed paper directory to a modern, mobile friendly application. The most searched-for materials are consistently: Appliances, Batteries, Construction / Demolition Debris, Electronics, and Furniture. The division constantly seeks to refine and improve the What do I do with...? website, which currently provides information on over 100 materials.

Turning Wastes to Resources

In 2004, King County adopted "Zero Waste of Resources" as a principle designed to eliminate the disposal of materials with economic value. Zero Waste does not mean that no waste will be disposed; it proposes that maximum feasible and cost-effective efforts be made to prevent, reuse, and reduce waste. The division has been taking steps to eliminate the disposal of materials that have economic value and for which there are viable markets.

King County's list of designated recyclables is defined and updated by Ecology's annual statewide survey of materials that have been recycled in Washington. The current list is shown in Table 4-2:

Recicla Mas Facilitadores or facilitators of recycling teach recycling and composting basics at a community event in King County

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Table 4-2. Designated recyclables

Category	Includes
Carpet and Pad	Carpet and pad remnants.
Clean Wood	Unpainted and untreated wood, including wood from construction and demolition projects, and pallets.
Construction and Demolition Debris	Recyclable and non-recyclable materials that result from construction, remodeling, repair or demolition of buildings, roads, or other structures and requires removal from the site of construction or demolition. Construction and demolition debris does not include land clearing materials such as soil, rock, and vegetation.
Electronics	Includes audio and video equipment, cellular telephones, circuit boards, computer monitors, printers and peripherals, computers and laptops, copier, and fax machines, PDAs, pagers, tapes and discs, and televisions.
Furniture	Includes mattresses and box springs, upholstered and other furniture, reusable household and office goods.
Glass	Clean glass containers and plate glass[1].
Metal	Clean ferrous and non-ferrous metals, including tin-plated steel cans, aluminum cans, aerosol cans, auto bodies, bicycles and bicycle parts, appliances, propane tanks, and other mixed materials that are primarily made of metal.
Moderate Risk Waste	Moderate risk waste from households and small quantity commercial generators, including antifreeze, household batteries, vehicle and marine batteries, brake fluid, fluorescent lights, oil-based paint, thermometers and thermostats, used oil, and oil filters.
Organics	Food scraps and food-soiled paper; fats, oils, and grease (FOG); biodegradable plastic kitchenware and bags[2]; yard waste, woody materials under 4 inches in diameter; and stable waste (animal manure and bedding).
Other Materials	Includes latex paint, toner and ink cartridges, photographic film, tires, and other materials reported as recycled to the Department of Ecology in response to annual recycling surveys.
Paper	All clean, dry paper including printing and writing paper, cardboard, boxboard, newspaper, mixed paper, and aseptic and poly-coated paper containers.
Plastic	All clean, single-resin plastic numbers 1 through 7, including containers, bags, and film (wrap).
Textiles	Includes rags, clothing and shoes, upholstery, curtains, and small rugs.

1 Plate glass is not accepted in curbside programs.

2 Biodegradable plastic products must be approved by organics processing facility receiving the material.

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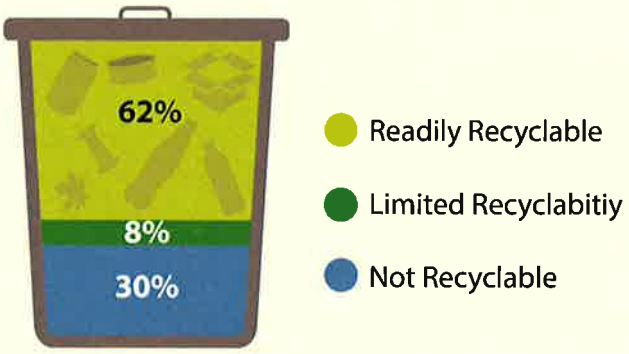
While the list of recyclable materials is extensive, available markets and infrastructure can vary from region to region. The division prioritizes materials for recycling in King County based on four key factors:

- The amount present in the waste stream,
- The ability to handle the material – both collection and processing,
- Viable and sustainable markets for the material, and
- Environmental considerations.

These factors are also used to determine the appropriate method for capturing the materials, i.e., through curbside collection or at county transfer facilities. The division may also consider other technologies such as anaerobic digestion or demonstration projects of other evolving technologies that promote resource recovery as ways to recycle or reuse materials. Since the 2001 Comprehensive Solid Waste Management Plan was issued, the list of materials that are being recycled has grown substantially.

In 2017, over 931,000 tons of solid waste were disposed at Cedar Hills. As shown in Figure 4-5, at least limited options in the market exist for the recycling of about 70 percent of the materials disposed.

Figure 4-5. Recycling potential of materials disposed in 2015



For years, the Pacific Northwest has relied almost exclusively on exporting recyclable paper and plastics to China for processing. In early 2018, however, China made the specification for contamination so low (0.5 percent) that it is extremely difficult to meet, essentially banning the import of 24 recyclable commodities, including unsorted paper and mixed #3 - #7 plastic. Recyclable materials entering recycling facilities may be contaminated for a variety of reasons, including commingling the materials in one bin, new packaging types, and resident confusion. Some materials being collected as part of the approved recyclables list have no markets, contaminate other valuable recyclable material, and/or create problems in the processing system (examples include plastic bags, poly-coated paper, cartons and aseptic packaging). China's ban is intended to crack down on illegal smuggling of foreign waste brought in under the guise of recycling, improve environmental quality, and reduce the volume of contaminated recyclables legally brought into the country.

In response, agencies, cities, and haulers in King County have formed the Responsible Recycling Task Force (Task Force). The Task Force will identify common ground for advancing recycling given China's restrictions on acceptable recyclables, focusing on short-, mid- and long-term actions. Tenants of responsible recycling include:

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- Focus on the quality and quantity of recyclables, including reducing contamination,
- Use consistent and harmonized messaging across the region,
- Prioritize domestic processing and markets for recyclables (including the social justice and environmental impacts of export),
- Create domestic demand for recycled feedstock,
- Understand that responsible recycling is not free, and
- Shift to measure recyclables that are made into new products.

While this issue presents a policy challenge for the region, it offers an opportunity to improve on recycling in the region, reeducate the public on recycling best practices, reduce contamination, and reinforce waste prevention messaging.

Priority Materials

The following sections describe priority materials identified by the division for recycling through curbside collection and at county transfer facilities.

Priority Materials for Curbside Collection

Over time, new materials that can be efficiently and cost-effectively captured for recycling are added to curbside collection programs. Adding materials for curbside collection requires sufficient infrastructure for collection and processing, and viable and sustainable end use markets. Standardizing the materials collected across the county simplifies recycling education, reduces confusion among consumers as to what is recyclable, and increases collection efficiency. However, all materials listed as priorities are not required to be recycled in all city programs.

When the 2001 Comprehensive Solid Waste Management Plan was adopted, materials collected at the curb included newspaper, cardboard, mixed paper, plastic bottles, tin and aluminum cans, glass bottles and jars, and yard waste. Materials added since that time include food scraps and food-soiled paper; aerosol cans; small scrap metal; plastic jugs and tubs; plastic plant pots, trays, and clamshells; plastic and paper drink cups; and aseptic containers.

Organics

More than one-third of what gets disposed at Cedar Hills landfill is food scraps and food-soiled paper. Collection and processing of these food scraps is critical to meet the county's ambitious waste diversion targets and climate change goals. There is also a growing effort to capture a large portion of the food scraps that are still considered to be edible. A recent division study of service management businesses and restaurants in King County (Cascadia 2017b) estimated that approximately three-quarters of the food scraps these businesses generated was edible food. Significant opportunities remain to reduce and prevent the tons of food scraps that are disposed.

Commercial haulers throughout King County offer organics collection to both residential and commercial customers. Nearly all single-family households (99 percent) in King County have access to curbside organics collection that includes food scraps and food-soiled paper products. Unpackaged food scraps and approved compostable paper products can be collected along with yard waste in the same containers. King County and many cities have implemented public education and outreach campaigns to promote and increase participation in food scrap

diversion through curbside organics collection. The division also funded a grant program to promote commercial food scraps recycling. While participation rates appear to be increasing, there remains room for improvement. Challenges to food scraps collection include customer access (such as at multi-family residential units where organics collection is not required or offered by property management), participation levels in diversion programs, political and institutional barriers, and the level of contamination of the organics collected. As collection of organics increases it will be essential to ensure adequate regional processing capacity and reduced contamination of material. The division is actively working with regional partners to:

Engage in long-range planning to increase organics processing capacity,

Encourage greater use of compost, and

Encourage operational changes at processing facilities to mitigate impacts on the surrounding community.

Priority Materials for Collection at King County Transfer Facilities

The division has identified several priority materials to collect at all transfer stations once they are renovated or replaced:

- Yard and wood waste,
- Cardboard,
- Clean wood (not treated or painted), and
- Scrap metal.

Some materials designated for curbside collection and/or as priority materials for transfer station collection are also collected by private-sector businesses.

Markets for Recyclable Materials

LinkUp – Expanding Markets for Recyclable and Reusable Materials

Market development is an important strategy to ensure that recyclable materials are successfully moving from waste to resource. The division is working to expand markets for recyclable and reusable materials and facilitate the infrastructure that supports those markets, through its LinkUp Program. Working with businesses, public agencies, and other organizations, LinkUp develops projects that address specific market barriers (from collection to processing to end-use) that prevent or restrict a material or product from moving up the value chain for ultimate reuse or use as a raw material for manufacturing new products. In recent years, LinkUp has conducted projects to improve markets for asphalt shingles, carpet, mattresses, compost, and textiles. Projects have supported efforts, such as the development of collection and processing infrastructure for asphalt roofing shingles, carpet, and mattresses; establishment of the hot mix asphalt pavement market for asphalt shingles; expansion of the Take it Back Network to include latex paint, and promotion of the network to the public; public education to promote donation of damaged textiles for reuse or recycling; and demonstration of the use of compost for agricultural applications by King County farmers.

Developing markets for asphalt shingles has been one focus of the LinkUp program. Shown here are asphalt shingles used in paving roads

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2015 and 2017 Market Assessments

In 2015 and 2017, Cascadia Consulting Group conducted market assessments for the division that focused on commingled curbside recyclables, organics, electronics, film plastics, and construction and demolition materials (Cascadia 2015b and Cascadia 2017).

First, Cascadia conducted a preliminary analysis and ranking of potential focus materials. Evaluation metrics included disposed tons, disposed volume, GHG emissions if recycled rather than landfilled, ability to influence the county's recycling rate, and market strength. Table 4-3 shows the results of the preliminary analysis and ranking.

Table 4-3. Findings from 2015 and 2017 market assessments

Overall Ranking	Materials
High	Food and food-soiled paper* Clean wood Textiles* Film plastic (same score as textiles)
Medium	Electronics (covered by E-Cycle) #3-7 plastics Mattresses* (same score as #3-7 plastics) Clean (new) gypsum Electronics (not covered by E-Cycle) Asphalt Shingles* Carpet
Low	Treated wood Painted (demo) gypsum Tires

* Materials for which the division is already engaging in market support through the LinkUp program.

Cascadia then conducted "mini assessments" of the top six ranked materials, combining two categories of electronics, and excluding textiles and mattresses, for which the division already has market support efforts underway. Findings from these studies, which looked at the material supply for recycling, processing capacity, and current markets, included:

- Markets for commingled curbside recyclables, including paper, plastics, glass, and metals were generally stable in 2015. However, China's 2018 implementation of their "National Sword" policy to restrict the importation of mixed paper and mixed #3-#7 plastics has resulted in the immediate closure of a significant market for these recyclable materials. Annually, around 138,000 tons of these recyclable materials from King County that would normally go to China now need to be processed elsewhere. At this time, alternative export and domestic markets for mixed paper and mixed plastics are extremely limited. Food scraps and plastic film/wrap are the biggest contamination challenge in curbside commingled recycling.

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- Almost all organic materials collected within the King County system are being converted into compost products, which are primarily used as soil amendments. Anaerobic digestion (a biological process that transforms organic waste into renewable energy, and in some situations, a useable residual by-product) is an emerging processing technology in the region. More organics processing capacity is likely needed if there are to be significant increases in food scraps and food-soiled paper composting in King County and surrounding regions (See Chapter 5 for more information about processing capacity). Market prices and sales of compost products are reported to be stable. Expanding agricultural compost markets is of interest.
- Wood and plastic films have significant barriers to successful recycling. Wood markets are stable but weak and highly dependent on use as hog fuel. Barriers to plastic film recycling occur at all points of the supply chain.

Grants to Cities

Waste Reduction and Recycling Grants

Clean wood is collected at the Bow Lake Recycling and Transfer Station

The division provides grant funds and technical assistance to cities to help further waste prevention and recycling programs and services within their communities. Each year, King County distributes over $1 million in grant funds to cities; these funds are supported by the solid waste tipping fee. All cities in the service area are eligible for the funds. The formula for their allocation includes a base amount plus a percentage based on the city's population and employment.

Currently, much of these grant funds is used by the cities to hold recycling collection events in their communities. The cities and the county may be able to phase out these collection events and use the funds in other ways that support waste prevention and recycling in their communities as enhanced recycling services are added at renovated transfer facilities, curbside collection for bulky items becomes more cost effective and widely available, and product stewardship programs begin to offer more options for recycling. The grant monies can be used to support a number of activities, including:

- Encouraging and promoting waste reduction,
- Continuing to implement and improve general recycling programs,
- Improving opportunities for the collection of specific commodities, such as paper,
- Improving opportunities for the collection and/or composting of organic materials,
- Increasing the demand for recycled and reused products,
- Fostering sustainable development through the promotion of sustainable building principles in construction projects,
- Managing solid waste generated by public agencies in a manner that demonstrates leadership,
- Broadening resource conservation programs that integrate waste prevention and recycling programs and messages, and
- Providing product stewardship opportunities.

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Local Solid Waste Financial Assistance Grants

Ecology also supports waste prevention and recycling programs in King County through the Local Solid Waste Financial Assistance (formerly known as the Coordinated Prevention Grant) program. Funds are allocated within the county based on population. The division uses funds allocated to the unincorporated areas to support waste prevention and recycling efforts such as recycling collection events, yard waste and food scrap recycling, and natural yard care education and promotion. The cities also receive funds directly from Ecology to support their own waste prevention and recycling programs (applications are coordinated through the division).

Competitive Grant Program

In 2012, the division worked collaboratively with the cities to develop a new competitive grant program to fund innovative projects and services that further the waste prevention and recycling goals outlined in this Plan. Cities, commercial collection companies, and other entities, such as non-profit organizations or schools, would be eligible to apply for the grant program. The program has not been approved by the cities or funded through the solid waste rate, but the division will continue to work with the cities to identify opportunities to initiate the new competitive grant program in the future.

Cities use some of their grant money to hold recycling collection events

In the meantime, the division has initially funded a small competitive grant program through the Solid Waste Division budget with the focus on commercial food waste. A program funded through the solid waste rate would extend reach and impact. Descriptions of the funded projects can be found online at: *your.kingcounty.gov/solidwaste/garbage-recycling/commercial-grants.asp*

Sustainable Purchasing

King County is also working to reduce the impacts of its operations by purchasing products that have recycled content and are more resource-efficient and durable. *The Sustainable Purchasing Program* provides county personnel with information and technical assistance to help them identify, evaluate, and purchase economical and effective sustainable products and services.

The division will continue to provide technical assistance to cities by sharing contracts, specifications, and procurement strategies. Many cities in the county have also implemented environmentally preferable purchasing programs.

Another strategy to increase sustainable purchasing is to provide training and education about the benefits of compost applications in parks and landscape projects, topdressing grass in parks, and stormwater management applications.

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Collection

The remainder of this chapter looks at the current collection challenges and recommendations for improvement for three sectors of generators – single-family households, multi-family households, and non-residential customers, which include businesses, institutions, and government entities. For each sector, the issues may vary and present different challenges due to collection methods and the regulations by which they are governed. Construction and demolition debris is discussed separately at the end of this chapter because of the unique nature of collecting and processing these materials.

Residential Collection

The residential garbage collection system in King County is a well-established system that serves the region in a safe, efficient, and cost-effective manner. With the shift toward increased collection services for recyclables and organics, customers can choose to subscribe to smaller, less expensive collection cans for their garbage. Container sizes now range from the micro-can at 10 gallons to the mini-can at 20 gallons and on up to the large 90+ gallon cart. The reduced fee for the smaller cans creates an incentive to generate less waste and divert as much material as possible to the recyclables or organics carts.

Throughout King County, individual city contracts for collection of garbage, recyclables, and organics differ in a number of aspects. Cities have entered into contracts with the collection companies at different times and then renewed contracts as they have expired. Each time a contract is negotiated and renewed, the city may make adjustments to their services such as changing the range of materials being collected, the collection frequency, container types or sizes, fee structures, and more. Changes to services may also be negotiated for existing contracts. The varying collection standards among cities that have resulted from these changes over time have led to inconsistencies in regional education and messaging, confusion among customers, and difficulties in measuring and potentially attaining region wide goals.

To illustrate the varying collection standards that currently exist, Table 4-4 presents a summary of single-family collection services by city and unincorporated area, showing the types of contracts held, the collection company serving the jurisdiction, container sizes offered, collection frequency, and fee structures. The recycling rates for each jurisdiction and unincorporated area, with and without organic materials, are also presented for comparison. The UTC cost assessment in Appendix A (Section 3.3) provides additional information about the UTC-regulated and contracted companies.

A truck picks up in a neighborhood (Photo courtesy of Republic Services)

Working with the community and the hauler, the division is exploring the inclusion of Vashon/Maury Island in the service level standards, as well as other ways to improve recycling services provided curbside and at the transfer station. Skykomish and Snoqualmie Pass will not be included in the service level standards at this time because of their remote locations and low population densities.

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Table 4-4. Summary of single-family collection for garbage, recycling, and organics in King County

Jurisdiction or Unincorporated Area	Type of Collection[a]			Cart Size (gallons)[b]		Collection Frequency[c]			Fee Structure		Disposal & Recycling Rates (2016)[d]		
	2016 Collection Company	Contract / UTC	Mandatory Garbage Collection	Standard Recycling Cart	Standard Organics Cart	2016/17 Frequency of Recycling Collection	2016/17 Frequency of Organics Collection (spring-summer-fall)	2016/17 Frequency of Organics Collection (winter)	Recycling Included in Garbage Fee	Organics Included in Garbage Fee	Garbage Disposal (lbs/cust/wk)	Recycling Rate (including organics)	Recycling Rate (excluding organics)
Cities													
Algona	WM	C	X	64	96	EOW	EOW	EOW	X		40	37%	21%
Auburn	WM	C	X	96	96	EOW	W	W	X		24	49%	28%
Beaux Arts	RS	UTC		96	96	EOW	EOW	EOW	X		27	59%	42%
Bellevue	RS	C		96	96	W	W	W	X	X	23	65%	39%
Black Diamond	RS	UTC		96	96	EOW	EOW	EOW	X		32	47%	26%
Bothell[f]	RE	C	X	64	96	W	W	W	X	X	25	62%	37%
Burien[g]	RE	C		96	96	EOW	W	EOW	X	X	24	61%	35%
Carnation	RE	C	X	96	96	EOW	W	W	X		25	60%	27%
Clyde Hill	RS	C		96	96	EOW	W	EOW	X	X	29	63%	39%
Covington	RS	C	X	96	96	EOW	EOW	EOW	X		29	46%	27%
Des Moines	RE	C		96	96	EOW	EOW	EOW	X		27	49%	32%
Duvall	WM	C	X	64	96	W	W	EOW	X		23	56%	33%
Enumclaw	City	City	X	96	96	EOW	EOW	EOW	X		22	55%	29%
Federal Way	WM	C		96	96	EOW	W	W	X		27	50%	28%
Hunts Point	RS	UTC		96	96	EOW	EOW	EOW	X		34	56%	32%
Issaquah	RE	C		96	96	W	W	W	X	X	20	59%	42%
Kenmore	RS	UTC		96	96	EOW	EOW	EOW	X		26	55%	33%
Kent	RS	C	X	96	96	EOW	EOW	EOW	X	X	26	51%	29%
Kirkland	WM	C	X	64	96	W	W	W	X	X	20	65%	37%
Lake Forest Park	RS	C		96	96	EOW	EOW	EOW	X	X	23	65%	38%
Maple Valley[j]	RE	C		96	96	EOW	EOW	EOW	X		28	49%	29%
Medina	RS	UTC		96	96	EOW	EOW	EOW	X		29	61%	34%
Mercer Island	RS	C		96	96	EOW	EOW	EOW	X	X	25	65%	39%
Newcastle	WM	C		96	96	EOW	W	EOW	X		23	51%	32%
Normandy Park	RS	C		96	96	EOW	EOW	EOW	X		28	55%	32%
North Bend	RS	C	X	64	96	W	EOW	EOW	X	X	28	56%	35%
Pacific[e]	WM	C	X	64	96	EOW	EOW	EOW		X	24	49%	26%
Redmond	WM	C		64	96	W	W	W	X	X	21	61%	35%

Jurisdiction or Unincorporated Area	Type of Collection[a]			Cart Size (gallons)[b]		Collection Frequency[c]			Fee Structure		Disposal & Recycling Rates (2016)[d]		
	2016 Collection Company	Contract / UTC	Mandatory Garbage Collection	Standard Recycling Cart	Standard Organics Cart	2016/17 Frequency of Recycling Collection	2016/17 Frequency of Organics Collection (spring-summer-fall)	2016/17 Frequency of Organics Collection (winter)	Recycling Included in Garbage Fee	Organics Included in Garbage Fee	Garbage Disposal (lbs/cust/wk)	Recycling Rate (including organics)	Recycling Rate (excluding organics)
Cities													
Renton[h]	RS	C	X	96	96	EOW	W	W	X	X	20	60%	36%
Sammamish[l]	RS	C		96	96	W	W	W	X	X	25	58%	35%
SeaTac[i]	RS/RE	C		96	96	EOW	EOW	EOW	X	X	29	53%	30%
Shoreline	RE	C		96	96	EOW	EOW	EOW	X		23	54%	34%
Skykomish	City	City	X	NS	NS	NS	NS	NS					
Snoqualmie	WM	C	X	64	96	W	W	W	X	X	26	53%	35%
Tukwila	WM	C		96	96	EOW	EOW	EOW	X		28	44%	29%
Woodinville	WM	UTC		96	96	EOW	W	EOW	X		27	54%	32%
Yarrow Point	RS	UTC		96	96	EOW	EOW	EOW	X		30	52%	34%
Sammamish Klahanie	RS										24	60%	25%
Subtotal Cities											**26**	**55%**	**33%**
Unincorporated Areas													
Northern County	RS WM	UTC		96	96	EOW	EOW	EOW	X		28	53%	32%
Southern County	RS WM	UTC		96	96	EOW	EOW	EOW	X		28	46%	29%
Vashon Island	WC	UTC		96	NS	EOW	NS	NS			31		7%
Snoqualmie Pass	WM	UTC		NS	NS	NS	NS	NS					
Subtotal Unincorporated Areas											**29**	**49%**	**23%**
Total County											**28**	**52%**	**28%**

a Collection Companies:
RS - Republic Services
RE - Recology / CleanScapes
WC - Waste Connections
WM - Waste Management

b Cart sizes listed are the most commonly distributed; other cart sizes are available in many jurisdictions.

c Collection Frequency:
EOW - every other week *W - weekly*
M - monthly *NS -no service*

d Recycling and disposal rates include an adjustment to remove estimated contaminant tonnage from recycling totals and add it to disposal totals.

e Pacific's Pierce County and King County areas are served by Waste Management effective October 5, 2015 (update 1/8/16).

f Bothell's primary hauler changed from Waste Management to Recology on January 1, 2015 . Waste Management continues to provide service in some annexed portions of Bothell.

g Burien's hauler changed from Waste Management to Recology on June 1, 2014; embedded organics was not included before June 1.

h Renton has every-other-week garbage collection in areas served by its primary hauler, Republic Services.

i SeaTac's hauler changed from Republic Services to Recology on June 1, 2014; embedded organics was not included before June 1.

j Maple Valley's primary hauler changed from Waste Management to Recology on September 1, 2014

k Clyde Hill's new contract effective April 1, 2015 includes organics service in the basic garbage fee.

l Annexation areas in Sammamish still follow UTC service levels
Klahanie - Rec (w) Org (W, except for EOW Dec-Feb)
Aldarra-Montaine - EOW Rec and Org
Camden Park & Mystic Lake (WM annexed areas)- Rec (W) Org (W, except for EOW Dec-Feb)

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As shown in Table 4-4, the single-family recycling rate varies significantly among the cities and unincorporated areas, ranging from 37 to 65 percent (combining organics and the curbside recyclables) with an average of 55 percent. While it would be difficult to identify a single factor or factors that will ensure a higher recycling rate, there are some factors that appear to lead to increased participation and amounts of waste diverted from disposal, as discussed in the following sections.

Range of Materials Collected

In addition to the materials identified for curbside collection in the last Comprehensive Solid Waste Management Plan – newspaper, mixed paper, and cardboard; tin and aluminum cans; plastic bottles; glass bottles and jars; and yard waste – new materials have been added over time. These materials include food scraps and food soiled paper, aerosol cans, small scrap metal, plastic jugs and tubs, plastic plant pots, plastic trays and clamshells, drink/coffee cups, and aseptic cartons/containers (such as juice boxes). Some cities have added other materials for collection, such as electronics, fluorescent bulbs and tubes, and motor oil.

Curbside collection, however, is not necessarily the most efficient and cost-effective way to capture every type of recyclable or reusable product. Some products cause problems for materials recovery facilities because of their size or composition, while others are better candidates for take-back programs by manufacturers and retailers to extract potentially harmful components and recycle other components. Examples of these types of materials and their particular challenges include the following:

- **Plastic bags and plastic wrap** are prevalent in the waste stream, particularly residential. Collection of plastic bags in the recyclables cart creates a nuisance further down the line at the material recovery facilities. As the bags move through the facility they sometimes catch in and jam the sorting machinery, and they can blow around and cause litter problems. For these reasons, curbside collection may not be the best option for plastic bags and wrap at this time. More appropriate options for consideration may be an increased use of reusable shopping bags and the establishment or expansion of take-back programs at the retail level. For instance, the Wrap Recycling Action Program (WRAP), a national initiative, provides a network of drop-off locations for clean and dry plastic film, including wraps, bags and flexible packaging, to be recycled.

- **Electronic Products and Fluorescent Bulbs and Tubes** Collecting these materials at the curb is complicated by the fact that some of them tend to break easily and contain potentially hazardous materials that must be safely disposed. In Washington State, legislation requires manufacturers of computers, monitors, and televisions to provide separate locations for free recycling of these items. Handling electronics through product stewardship ensures that the various components, such as glass, plastic, and metals, are separated and recycled as appropriate and that any potentially

Fluorescent tubes are collected at the Factoria Recycling and Transfer Station

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hazardous materials are recycled or disposed in a safe and environmentally sound manner. Product stewardship efforts reduce costs to local governments and their ratepayers by eliminating the costs to recycle these products. Take-back programs have also been implemented for fluorescent bulbs and tubes. Cities such as Kent and Shoreline and have contracted with their recycling collection companies to develop a safe, convenient program for collecting fluorescent bulbs and tubes at the curb. The City of Bothell's garbage and recycling collection contract includes curbside collection of electronic products and fluorescent bulbs and tubes as well as collection at the The Recology Bothell store.

Some cities offer collection of small appliances and home electronics not covered by Washington's current product stewardship laws. For appropriately sized products that do not contain hazardous materials, curbside collection is a viable and efficient option.

- **Polystyrene Foam** – One type of plastic that is not recommended for residential curbside collection is expanded polystyrene foam, commonly known as Styrofoam, which includes clamshell containers for take-out foods and blocks of plastic that are used to package many electronics and other goods. These materials are light and bulky, can break easily into small pieces, readily mix with other materials causing contamination, and are difficult to separate out at the material recovery facilities. In addition, the quantity collected is so small that it takes a long time to collect enough of the material to ship to market. Although there are challenges to collecting expanded polystyrene foam packaging curbside, the City of Des Moines began offering its single-family residents this service in 2012. Block expanded polystyrene foam (not packing peanuts) is accepted and residents are asked to put the blocks in a clearly labeled plastic bag and place it next to their curbside recycling cart. This allows the expanded polystyrene foam blocks to be handled separately from the commingled recyclables. The cities of Issaquah and Seattle have taken another approach and banned the use of expanded polystyrene foam containers for take-out foods. Other cities, such as Kirkland and Redmond, have regular or semi-regular collection events to collect expanded polystyrene packaging.

Size of Collection Container

The size of the recycling collection cart can affect recycling success. Areas where most residential customers use smaller recycling carts have reported lower recycling rates and when larger carts have been provided the recycling rate has increased. As more materials are identified for commingled recycling, and food scraps are added to the yard waste cart, recyclables carts are getting larger and the size of garbage can to which customers subscribe should become smaller.

Frequency of Collection

Adjustments to the frequency of curbside collection for garbage, recyclables, and organics can also be used to influence recycling and disposal behaviors and reduce collection costs and truck traffic. Garbage collection across King County typically occurs on a weekly basis. This collection schedule has been driven, in part, by the presence of food scraps and other organics in the garbage that rapidly decompose and have the potential to lead to environmental or public health concerns. With separate collection of organics for recycling, there is an opportunity to modify weekly garbage collection to benefit ratepayers and to create a more environmentally sustainable system.

One of the most important factors in determining the appropriate collection frequency for the various material streams, particularly for organics (yard waste and food scraps), is compliance with the public health and environmental standards in Title 10 of the Code of the King County Board of Health. To study the effects of changing the collection method and possibly the frequency of collection, in summer 2007 the division conducted a pilot

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Regulatory Changes Allow Adjustments in Collection Frequency Schedules

After successful completion of the Renton pilot study, a variance to Title 10 of the Code of the King County Board of Health was approved to allow every-other-week collection of organics (with the yard waste) for single- and multi-family residents, as well as every-other-week collection of residential garbage. The variance applies as long as the following standards (excerpted directly from the variance) are met. During the next review of the Title 10 Health Code, these variances are scheduled to be adopted.

Residential (Single-Family) Garbage Collection

Residential garbage may be collected every other week provided that:

- Garbage is contained in a provided cart.
- A food scrap collection program is available and actively promoted to residents.
- The garbage collection and food scrap collection services are offered on alternating weeks to ensure that customers have access to at least weekly disposal or composting options for problematic compostables.
- Residents are instructed to bag all garbage before placing it in carts to reduce vectors, free liquids, and litter.

Residential (Single- and Multi-family) Organics Collection (with yard waste)

- When mixed with yard debris, residential food scraps may include all vegetative, meat, dairy products, pastas, breads, and soiled paper materials used for food preparation or handling; provided that all collected materials are picked up by haulers which deliver the mixed yard waste to a permitted transfer and/or permitted composting facility for serviced customers.
- Combined food scraps and yard debris shall be collected no less frequently than every-other-week, year-round provided that there are no leachate generation, odor, or vector problems.
- Combined food scraps and yard debris shall be collected in carts. Residents shall be instructed to place food scraps only in the cart provided to them. Any extra customer-provided cans or large paper bags shall contain only yard debris.
- Compostable bags may be used to consolidate food scraps placed in carts if and only if the bags have been approved by the facility receiving the material for composting. Plastic bags shall not be used for yard/food debris.
- Haulers shall make available a cart-cleaning or replacement service for customers with carts which have unacceptable residue or odor levels to avoid improper disposal of rinse water to storm drains, yards, etc., and reduce the need for customers to self-clean their containers.
- Educational and promotional materials from the county, city, and haulers shall inform residents about the benefits of recycling food scraps and soiled paper; and appropriate options for managing it, including the use of approved compostable bags; and appropriate options and restrictions for cleaning carts.

Commercial/Multi-family Food Scraps Collection (without yard waste)

- Food scraps shall be collected in leak-proof, contractor-provided containers with tightly-fitting lids.
- Containers shall be kept clean through the use of contractor-cleaning, compostable bagging, compostable cart lining or boxing, or limiting the types of materials collected from a particular customer.
- Containers shall be cleaned by the customer or the hauler immediately upon the request of City, County, or Public Health personnel.
- Customers shall be informed of container cleaning restrictions (i.e., proper disposal of rinse water and any residues from containers outside of storm drains, landscaping, etc.).
- Customers shall be informed of what is not acceptable in containers and the need to keep container lids closed when not in use and inaccessible overnight.
- Collection of commercial/multi-family food scraps shall occur weekly at a minimum. Any exception to the minimum weekly schedule will have to be justified by information on a particular customer's food scrap composition, where it can be shown that less frequent collection can occur without leachate generation, odor, and vector problems.

study in cooperation with the City of Renton, Waste Management (the collection company), and Public Health. The purpose of the study was to explore the public health and environmental impacts, customer responses, and effects on potential waste diversion that would result from changes in collection. In particular Public Health was concerned about the feasibility of collecting meat and bones every other week in the yard waste cart and changing garbage collection to less than weekly. To explore these concerns, approximately 1,500 Renton households participated in the six-month pilot study to look at two different collection schedules:

- Every-other-week collection of all three solid waste streams – garbage, recyclables, and organics, and
- Every-other-week collection of garbage and recyclables and weekly collection of organics.

The pilot study showed positive results for both collection schedules tested. There were no negative health or environmental impacts observed, and customers were highly satisfied with the collection schedules and the container sizes provided to adjust for the shift in schedule. Study results indicated not only a 20 percent decrease in the amount of garbage disposed, but an overall reduction in the generation of garbage, recycling, and organics. An added benefit was the reduction in truck traffic and transportation costs with the less frequent collection cycles.

As a result, the City of Renton rolled out a citywide program in January 2009 to offer every-other-week collection of garbage and commingled recyclables, with every week collection of organics.

Renton is the first city in King County to provide every-other-week garbage collection as the standard collection service for single family households. By 2013, Renton's disposal per household had dropped by 23 percent. While other factors such as the economic downturn likely played a role in disposal reductions, data from all of King County over the same time period estimated a disposal drop of 8 percent, suggesting that every-other-week garbage is a significant tool to reduce disposal and increase recycling.

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Fee Structure

Curbside Recycling Services: In nearly all areas of King County, households paying for garbage collection services also cover the embedded cost of recycling collection services. In most cases, unlimited amounts of recyclables can be set out. In contrast, the fee for garbage service varies depending on the number or size of containers each household sets out. A variation of this pay-as-you-throw system is to couple it with a linear rate structure in which there is no "bulk discount" for having a larger container and the price per gallon is the same across all service levels.

Consequently, King County residents have a clear financial incentive to reduce the amount they dispose and increase the amount they recycle.

Curbside Organics Services: Sixteen cities, comprising about 55 percent of the population in the county, have adopted rate structures that embed the cost of organics collection in the curbside garbage collection fee, providing a further incentive for residents to reduce disposal and maximize use of the recycling options for which they are paying. In 2016, the average pounds of garbage disposed per household in these cities was 12 percent lower than the average for the rest of King County.

Curbside Collection of Bulky Items for Residents

An ongoing issue with collection is finding the most efficient and cost-effective way to handle bulky waste – larger, individual items that do not fit in a garbage can or recycling cart. This type of waste includes recyclable items such as appliances, potentially reusable items such as furniture, and other large items that must be disposed.

Bulky waste collection services are available from collection companies throughout the county; however, these services are not widely used. Residents may not use the service because it is expensive, ranging from $25 to $128 per item, with the possibility of additional charges for travel time and labor. Customers may also be unaware of the collection options available to them. The primary alternatives to bulky curbside collection are self-hauling the materials to transfer stations for disposal or recycling, or taking them to collection events sponsored by the county or the cities. Neither of these self-haul options is an efficient way of handling the materials because of the number of vehicle trips, the increased number of transactions at transfer stations, and the high cost of staging collection events.

Bulky items are taken to a special recycling collection event

The current recommendation is to work with collection companies and the UTC to explore options to increase the efficiency and reduce the price of curbside collection of bulky items. For example, the cost would be lower if a small charge were included in the regular garbage fee, and curbside collection days were regularly scheduled and promoted, thereby increasing the efficiency of the collection routes. Collection systems for bulky items should be designed, to the extent possible, to divert reusable items to charitable organizations for resale, reuse community organizations (Green Bee or Buy Nothing community groups), and recyclable items to processing facilities.

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Single-Family Residential Minimum Collection Standards

Single-family collection services for garbage, recyclables, and organics are well established. As discussed earlier, however, there are many variations among the cities in the specific methods of collection and rate structures. The division has evaluated the factors that appear to lead to higher recycling rates and an increase in the diversion of materials from the garbage. Based on this evaluation, it is recommended that minimum collection standards be adopted by the cities and unincorporated areas to provide the optimal service level for reducing waste and increasing the diversion of recyclables and organics from disposal.

Working with the community and the hauler, the division is exploring the inclusion of Vashon/Maury Island in the service level standards, as well as other ways to improve recycling services provided curbside and at the Vashon Recycling and Transfer Station. Skykomish and Snoqualmie Pass will not be included in the service level standards at this time because of their remote locations and low population densities.

Curbside collection (Photo courtesy of Recology CleanScapes)

The minimum collection standards can be implemented as the county updates its service-level ordinance and jurisdictions amend their collection contracts (some of these targeted standards may not require changes to contracts or the county's service-level ordinance). A description of the recommended collection standards follows in Table 4-5.

Continuing education and promotion will also be important for increasing recycling and reducing wastes generated by single-family residents. The cities and the county will increase education and promotion to encourage the recycling of food scraps and food-soiled paper. In concert with the commercial collection companies, the cities and the county will also continue to focus promotions on the proper recycling of the standard curbside materials to increase participation and reduce contamination in the recycling containers. Financial incentives will also be explored through the fee structure for garbage and recyclables and grants to cities.

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Table 4-5. Single-family minimum collection standards

	Garbage	Recyclables	Organics
Required Materials for Collection*	Mixed solid waste	Newspaper, cardboard, mixed paper, and polycoated paper Plastic bottles, jugs, and tubs Tin and aluminum cans Glass bottles and jars Aseptic packaging Small scrap metal	Yard debris Food scraps Food-soiled paper
Container Type	Containers or wheeled carts	Wheeled carts	Wheeled carts
Container Size	Subscriptions available for various sizes	90+ gallon if collected every other week Smaller size if collected more frequently or if requested by customer	90+ gallons if collected every other week Smaller size if requested by customer
Frequency of Collection	Minimum of once a month	Minimum of every other week	Minimum of every other week
Fee Structure	Fee increases with container size	Recyclables collection included in garbage fee Additional containers available at no extra charge	Organics collection included in garbage fee Additional carts may be included in base fee or available at an extra charge Customers requesting smaller carts may be offered a reduced rate

**Subject to status of recyclables on King County's Designated Recyclables List*

Multi-Family Residential Collection

Multi-family recycling has not been as successful as single-family recycling. There are a number of contributing factors, including space constraints for collection containers and a higher turnover of residents and property managers. These factors make it difficult to implement standardized collection services and provide consistent recycling messaging to this diverse sector. Some local progress has been made, however, in developing consistent design standards to accommodate waste in multi-family complexes. In addition, in many areas of the county there is a trend in the construction of mixed-use buildings, which contain retail shops on the lower level and residential units above.

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Mixed-use buildings present somewhat similar challenges for recycling, including:

- A lack of space for adequate garbage, recycling, and organics collection (often competing with parking needs and other uses),
- A need for collaborative planning among property developers, garbage and recycling collection companies, and cities early in the development process to ensure that adequate space is designated for garbage, recycling, and organics containers in the building design, and
- Different customer types, both residents and employees, with different recycling needs.

Recycling could be increased substantially at multi-family complexes and mixed-use buildings by adopting minimum collection standards for multi-family collection. The multi-family standards vary somewhat from the single-family standards to account for differences in service structure. To improve recycling at mixed-use buildings, the cities and the county must consider both the multi-family collection standards and the recommendations for non-residential collection. A description of the recommended collection standards follows in Table 4-6.

Table 4-6. Multi-family minimum collection standards

	Garbage	Recyclables	Organics
Required Materials for Collection*	Mixed solid waste	Newspaper, cardboard, mixed paper, and polycoated paper Plastic bottles, jugs, and tubs Tin and aluminum cans Glass bottles and jars Aseptic packaging Small scrap metal	Yard debris Food scraps Food-soiled paper
Required Informational Labeling	Clearly mark containers indicating materials that are garbage. Information should include pictures	Clearly mark containers indicating materials acceptable for recycling. Information should include pictures.	Clearly mark containers indicating materials acceptable for organics container. Information should include pictures
Container Type	Wheeled carts or dumpsters	Wheeled carts or dumpsters	Wheeled carts or dumpsters
Container Size	Subscriptions available for various sizes	Service equal to garbage service	Subscriptions available for various sizes
Frequency of Collection	Weekly, or more often if needed	Weekly or more often if needed	Weekly or every other week
Fee Structure	Fee based on container size and/or collection frequency	Recyclables collection included in garbage fee Additional containers available at no extra charge	Subscription service available for an added fee

**Subject to status of recyclables on King County's Designated Recyclables List*

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Increased education and promotion are needed to improve recycling at multi-family complexes. It will require concerted efforts on the part of many to standardize the collection infrastructure and provide ongoing education and promotion for property managers and residents alike.

To further increase recycling in multi-family and mixed use buildings, the division, in cooperation with other jurisdictions, property managers, and owners of multi-family properties, collection companies and other stakeholders, has conducted several research and pilot studies (KCSWD 2014b and 2016b). The findings from these studies conclude that successful recycling depends on:

Recycling and garbage containers at an apartment complex. The signs detail what should be put in each bin

- **Collection logistics**: Effective programs place recycling containers for convenience, access, and ease of use; provide sufficient space and capacity for collection both inside and outside of the buildings; provide tools for collection, storage, and transport of recyclables and organics from units to collection points; and clearly label collection containers.
- **Policies and regulations**: Clear policies ensure that recycling is available and addresses issues such as contamination. Examples might be service level ordinances, city contracts that embed recycling in garbage rates, and building code requirements.
- **Education and outreach**: Effective recycling and food waste collection in multi-family buildings hinges on education and outreach. Strategies such as door-to-door outreach, property manager trainings, and onsite assistance have been successful. In addition, education and outreach that addresses non-English speaking communities is crucial.

Improving multi-family recycling will likely require, at a minimum, the following actions:

- **Clarify and strengthen building code requirements** – The division's GreenTools program has been working collaboratively with cities to develop standards that can be used for multi-family buildings. If adopted, these standards will help ensure that enough space is designed to allow for recycling in future construction.
- **Research collection and demographic characteristics, complex by complex** – Planning outreach strategies should begin with a careful look at language and other population demographics, collection infrastructure, tenant turnover rate, and other applicable characteristics of each complex. Outreach strategies must be comprehensive and flexible to fit the complex. Customized combinations of outreach tactics and education reinforcement, designed to address the researched characteristics of that complex, help ensure successful outreach which will increase recycling and decrease contamination.

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- **Provide manager and maintenance staff education** – Involvement and support from the property manager and staff is important to the long-term success of multi-family recycling. The institutional knowledge property managers can provide and the role they play in delivering education to each tenant and at each container are important considerations. This function should be supported with training and materials.
- **Provide ongoing recycling education for residents** – Recycling education needs to be provided on a continuing basis because most multi-family complexes have high tenant turnover. Providing education materials with the lease and at least annually coupled with information through newsletters and posters ensure that residents get the message and it is reinforced on a regular basis.
- **Involve collection companies to assist with service improvements and education** – The collection company should be involved to provide insight and information about complexes' recycling infrastructure systems and to help with education outreach and feedback to the tenants about the quality of the recycling and level of contamination. Companies should monitor the recycling performance of the complexes and tag or refuse pickup of loads that are contaminated.
- **Expand organics collection** – Currently, only a few cities are offering collection of food scraps and food-soiled paper to multi-family residents. The cities and the county will need to work with the collection companies to determine what containers and collection methods will work best for multi-family complexes. Education and promotion will be a critical component of the new multi-family food scrap collection programs.

A collection truck picks up garbage at a business (Photo courtesy of Waste Management)

Non-Residential Collection

The non-residential sector comprises a range of businesses, institutions, and government entities from manufacturing to high-tech and retail to food services. This sector has achieved recycling successes in the last few years, with a recycling rate of almost 71 percent in 2014, according to Ecology statewide recycling data.

Unlike the residential waste stream, the types of materials discarded by the non-residential sector differ widely from business to business. Thus, the recycling potential for any particular business or industry can vary greatly. For example, restaurants and grocers are the largest contributors of food scraps, while manufacturers may generate large quantities of plastic wrap and other packaging materials.

Because of the diversity of businesses in the region, a more individualized approach is needed to increase recycling in this sector. One area with significant room for improvement is the diversion of food scraps and food-soiled paper. The largest increase will be realized as more restaurants and grocers contract with private-sector companies to collect their food scraps for composting, and more cities begin to offer embedded commercial organics collection.

Strategies for increasing recycling in the non-residential sector present some of the same challenges as the multi-family sector, including:

- The lack of consistent and/or adequate building standards for locating collection containers.
- The need for financial incentives for business owners, property managers, and tenants to take advantage of recycling services. For example, cities that include recycling services in their garbage rate provide a financial incentive for businesses to recycle.
- A need for consistent and ongoing technical assistance and education. Involvement and support of the business owners and property managers is important to the long-term success of recycling at individual businesses or complexes. Educating building maintenance staff about properly collecting recyclables from building tenants is important to ensure the proper handling of recyclables. Education for employees about proper recycling methods is also crucial.

To assess the relative size of the non-residential waste stream in different jurisdictions, the division looked at the number of jobs located within them. About 94 percent of jobs in the King County service area are located within incorporated cities. More than 73 percent of these jobs are in cities where the garbage collection contracts include recyclables collection in the garbage fee. These contracts typically define the capacity required for recycling collection as 150 to 200 percent of the amount of garbage capacity, and target collection of the same materials as residential curbside programs.

Non-residential customers have the option to take advantage of recyclables collection offered by their service provider or to contract with other collection companies that may pay for the more valuable recyclable materials, such as high-grade office paper. For cities with collection contracts, adding recycling service to their contracts and including the cost of service in the garbage rate does lead to higher non-residential recycling rates and ensure that recycling services are available to all businesses. However, while including recycling service in the rate requires all businesses to pay for the service, it does not require that those businesses use the service that the city contractor provides. Businesses in unincorporated King County and cities with UTC-regulated collection services can choose from a wide array of recycling service providers in King County for their recycling needs. Promotion of these services by the county and these cities will help increase awareness among businesses of the available options. For example, the county's "What do I do with...?" website (*www.kingcounty.gov/whatdoldowith*) is one place businesses can look for a service provider.

Food waste comprises a large part of the waste stream at restaurants

Another strategy that might increase recycling for some business customers is to consider a rate structure based on weight or composition of waste, rather than the size of the container. A study was conducted to measure container weights for non-residential wastes on five weekday collection routes in the City of Kirkland over a 12-month period (KCSWD et al. 2008a). This study determined that businesses with large amounts of food scraps generate garbage

that is significantly heavier than the garbage generated by businesses without large amounts of food scraps. In Washington, non-residential garbage rates are based on the size of the garbage container. So generators of heavy materials, such as food scraps, pay less than they might if the rates were based on weight, as they are in some jurisdictions across the country. Because a weight-based rate would likely cost more for generators of large amounts of food scraps, it would provide an incentive for increased participation in organics recycling programs. Another strategy is to offer organics collection to businesses at no additional cost or at rates less than garbage.

Construction and Demolition Materials Collection and Recycling

Construction and demolition debris is from the construction, remodeling, repair, or demolition of buildings, other structures, and roads and accounts for approximately 30 percent of all waste generated in King County. Construction and demolition debris includes clean wood, painted and treated wood, dimensional lumber, gypsum wallboard, roofing, siding, structural metal, wire, insulation, packaging materials, and concrete, asphalt, and other aggregates. The county banned the disposal of large loads of construction and demolition debris at the county-owned transfer stations and Cedar Hills landfill in 1993. In the following years, until 2016, the division contracted with two private sector companies to manage the majority of the region's construction and demolition debris.

Construction and demolition materials are typically hauled from a job site by: 1) the contractor or individual working at the job site, 2) an independent construction and demolition debris hauler permitted to handle construction and demolition debris for recycling only, or 3) a collection company permitted to haul materials for both recycling and disposal.

Construction and demolition debris processing of recyclable materials occurs using either source-separated or commingled methods. Source-separated processing, which occurs particularly on large projects with adequate space, involves sorting specific types of construction and demolition material on the job site (e.g., metals, concrete, and clean wood) and transporting them to one or more recycling facilities. Commingled processing involves placing all recyclable construction and demolition debris in one container and then transporting the loads to a facility that uses mechanical and manual methods to sort the recyclable materials. Non-recyclable construction and demolition waste should be hauled directly to a construction and demolition debris transfer station where the waste is transferred to rail cars for transport to a landfill.

Container with construction and demolition debris for recycling

The division does not accept construction and demolition waste at its transfer stations or Cedar Hills landfill, except for incidental amounts. King County Ordinance 18166, effective January 2016, requires that construction and demolition waste must be taken to a designated privately-operated construction and demolition debris recycling and/or transfer facility. The division has agreements with the designated facilities that require these facilities to recycle readily recyclable materials. These

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facilities are banned from landfilling certain materials including: clean wood; cardboard; metal; gypsum scrap (new); and asphalt paving, bricks and concrete. All other construction and demolition waste may be disposed. As markets develop, the division will consider banning other construction and demolition materials as well.

With improvements in the ability of processing facilities to separate materials, the current trend is toward the commingling of recyclable construction and demolition debris. If recyclable construction and demolition debris and garbage are commingled, however, the recyclables are more difficult to extract and the processing facilities end up having lower facility diversion rates. These mixed loads should therefore be disposed of in their entirety.

Independent construction and demolition debris haulers with commercial permits can transport recyclable construction and demolition materials from job sites to either source-separated or commingled construction and demolition debris processors. These independent haulers cannot, however, transport construction and demolition materials for disposal. Only collection companies permitted by the UTC to haul solid waste can transport construction and demolition materials for disposal.

The designated facilities listed in Tables 4-7 and 4-8 have agreements with the division and are a part of a network of designated facilities where construction and demolition materials can be recycled and/or disposed. Figure 2-4, a map in Chapter 2, shows the locations of these facilties. These facilities agree to meet criteria that the division specifies for recycling of construction and demolition materials. The division contracts with the King County Sheriff's department to provide enforcement that helps to ensure that materials are being recycled. Cities are encouraged to adopt regulations that complement the King County ordinance. The division's GreenTools program is available to provide technical assistance to cities and has a model ordinance for cities to use.

Table 4-7. Designated facilities for non-recyclable construction and demolition waste (July 2018)

Construction and Demolition Material Facility	Location	King County Tons Processed in 2017
Republic Services		
Third & Lander Recycling Center & Transfer Station	2733 3rd Ave South, Seattle	10,358
Black River Recycling & Transfer Station	501 Monster Road, Renton	44,823
Waste Management		
Cascade Recycling Center	14020 NE 190th, Woodinville	14,237
Eastmont Transfer/Recycling Station	7201 W Marginal Way SW, Seattle	19,654
Recycling Northwest	701 2nd Street NW, Auburn	28,086

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Table 4-8. Designated facilities for recyclable construction and demolition waste (July 2018)

Construction and Demolition Material Facility	Location	King County Tons Processed in 2017
Alpine Recycling	3504 112th Street E, Tacoma	2,439
DRS Seattle (managed by DTG)	7201 E. Marginal Way S., Seattle	N/A
DTG Renton	701 SW 34th Street, Renton	77,077
DTG Woodinville	5906 238th Street SE, Woodinville	18,059
DTG Maltby	8610 219th Street SE, Woodinville	7,010
Maltby Container and Recycling	20225 Broadway Avenue, Snohomish	8,740
Recovery 1	1805 Stewart Street, Tacoma	6,352
United Recycling - Seattle	74 S. Hudson Street, Seattle	2,314
United Recycling - Snohomish	18827 Yew Way, Snohomish	23,896

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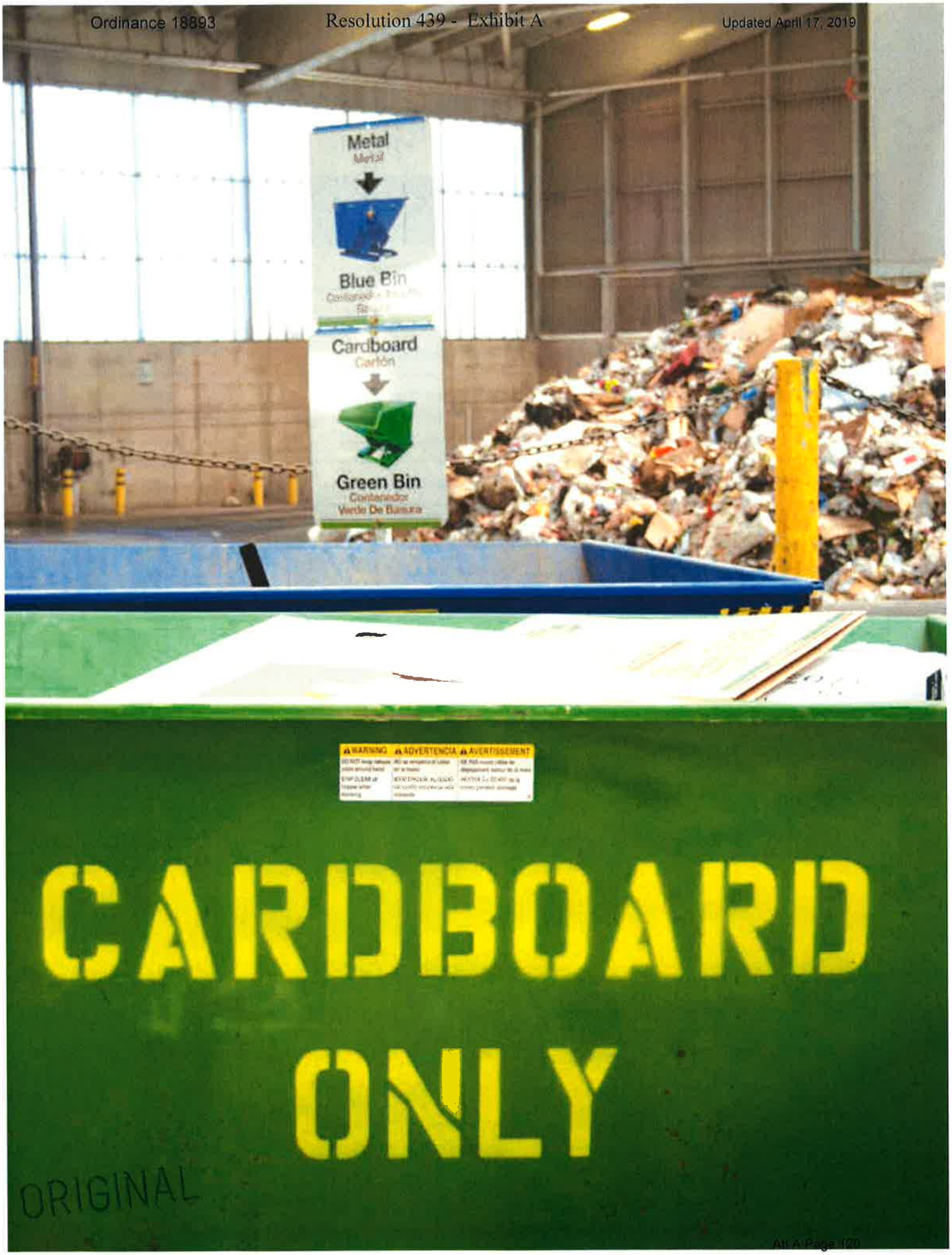
Metal
Blue Bin
Cardboard
Cartón
Green Bin
Contenedor
Verde De Basura
WARNING
ADVERTENCIA
AVERTISSEMENT
CARDBOARD
ONLY
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5 Solid Waste Transfer and Processing System

Policies

T-1 Provide solid waste services to commercial collection companies and self-haul customers at transfer stations, and to self-haul customers at drop boxes.

T-2 Provide solid waste transfer services in the urban and rural areas of the county that may be tailored to local and facility conditions and interlocal agreements with King County cities.

T-3 Engage cities and communities in the siting and development of facilities, and in developing mitigation measures for impacts related to the construction, operation, and maintenance of transfer facilities, as allowed by applicable local, state, and federal laws.

T-4 Build, maintain, and operate Solid Waste Division facilities with the highest green building and sustainable development practices.

T-5 Provide for collection of recyclable materials at all transfer facilities – recognizing resource limitations, availability of markets, and service area needs – focusing on maximum diversion of recyclables from the waste stream and on materials that are not easily recycled at the curb or through a readily available producer or retailer-provided program.

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Summary of Recommended Actions

The following table includes a menu of recommended actions that the county and the cities should implement. Under the responsibility column, the entity listed first has primary responsibility for the action, bold indicates that the entity has responsibility for the action, and a star (*) indicates that the action is a priority. If the responsibility is not in bold, the action has lower implementation priority.

Action Number and Responsibility	Action	Detailed Discussion
1-t County*	Except as noted in action 2-t, continue to implement transfer station modernization as set forth in the *Solid Waste Transfer and Waste Management Plan* and approved by the Metropolitan King County Council in 2007, including siting and building a new Northeast recycling and transfer station and closing the Houghton station when the new station is complete. Adapt the siting process included in the *Solid Waste Transfer and Waste Management Plan* to meet community needs in the Northeast service area.	Page 5-16
2-t County	Although approved for closure under the Solid Waste Transfer and Waste Management Plan, reserve the option to retain the Renton station until the new urban transfer facilities have been completed and the impact of closure has been fully evaluated.	Page 5-16
3-t County	Evaluate adding a second scale and an additional collection container at the Cedar Falls Drop Box to improve capacity.	Page 5-22
4-t County	After the new recycling and transfer stations (including the new South station) are sited, if service level assessments indicate the need for additional capacity in the rural areas, consider siting drop box facilities.	Page 5-22
5-t County, cities	Periodically evaluate the level of service criteria to ensure that the criteria remain relevant.	Page 5-11
6-t County	Explore prospects for the transfer of commercial loads of organics through county transfer stations.	Page 5-26
7-t County	Continue to implement a resource recovery program at new recycling and transfer facilities to remove targeted materials from the waste stream.	Page 5-5

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Summary of Recommended Actions

Action Number and Responsibility	Action	Detailed Discussion
8-t Material recovery facilities	Encourage recycling processors to continue to improve facility sorting and processing equipment and practices to remove contaminants and separate recyclables into marketable commodity grades.	Page 5-25
9-t County, cities, Public Health, haulers, processors*	In collaboration with stakeholders, pursue and identify new technologies and expanded processing capacity to serve the region, and more sustainably manage organic waste.	Page 5-26
10-t County	Continue to evaluate and assess the feasibility of advanced materials recovery and anaerobic digestion at division facilities.	Page 5-28
11-t County, cities	In the event of an emergency, reserve the transfer system for municipal solid waste and make the recycling of related debris a priority.	Page 5-24
12-t Cities, county	Identify potential temporary debris management sites where emergency debris can be stored until it is sorted for recycling or proper disposal.	Page 5-24
13-t Cities, county	Provide education and outreach on the proper management of home-generated sharps.	Page 5-6

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Solid Waste Transfer and Processing

The increased focus on environmental stewardship has reshaped the role of transfer stations in managing solid waste, creating the need for more robust and modern facilities that will facilitate a sustainable system in the future.

This chapter outlines a transfer system plan that will improve current levels of service, with the flexibility to adapt to changing needs and emerging technologies. The chapter also discusses plans for effectively managing local and regional emergencies.

The Transfer System and Services

The concept of a regional transfer and disposal network in King County grew out of a nationwide movement in the 1960s to impose stricter standards for protection of public health and the environment. The original purpose of the transfer network was to replace the open, unlined community dump sites in use at the time with environmentally safe transfer facilities where garbage could be delivered by curbside collection trucks and self-haulers. From these transfer sites garbage could then be consolidated into larger loads for transport to the Cedar Hills Regional Landfill (Cedar Hills) (see Figure 5-1).

Table 5-1 lists the locations of current transfer facilities, along with the tons of garbage, yard and wood waste received, numbers of customers served, and recycling services provided for at each facility.

Bow Lake Recycling and Transfer Station

Figure 5-1. Locations of solid waste facilities

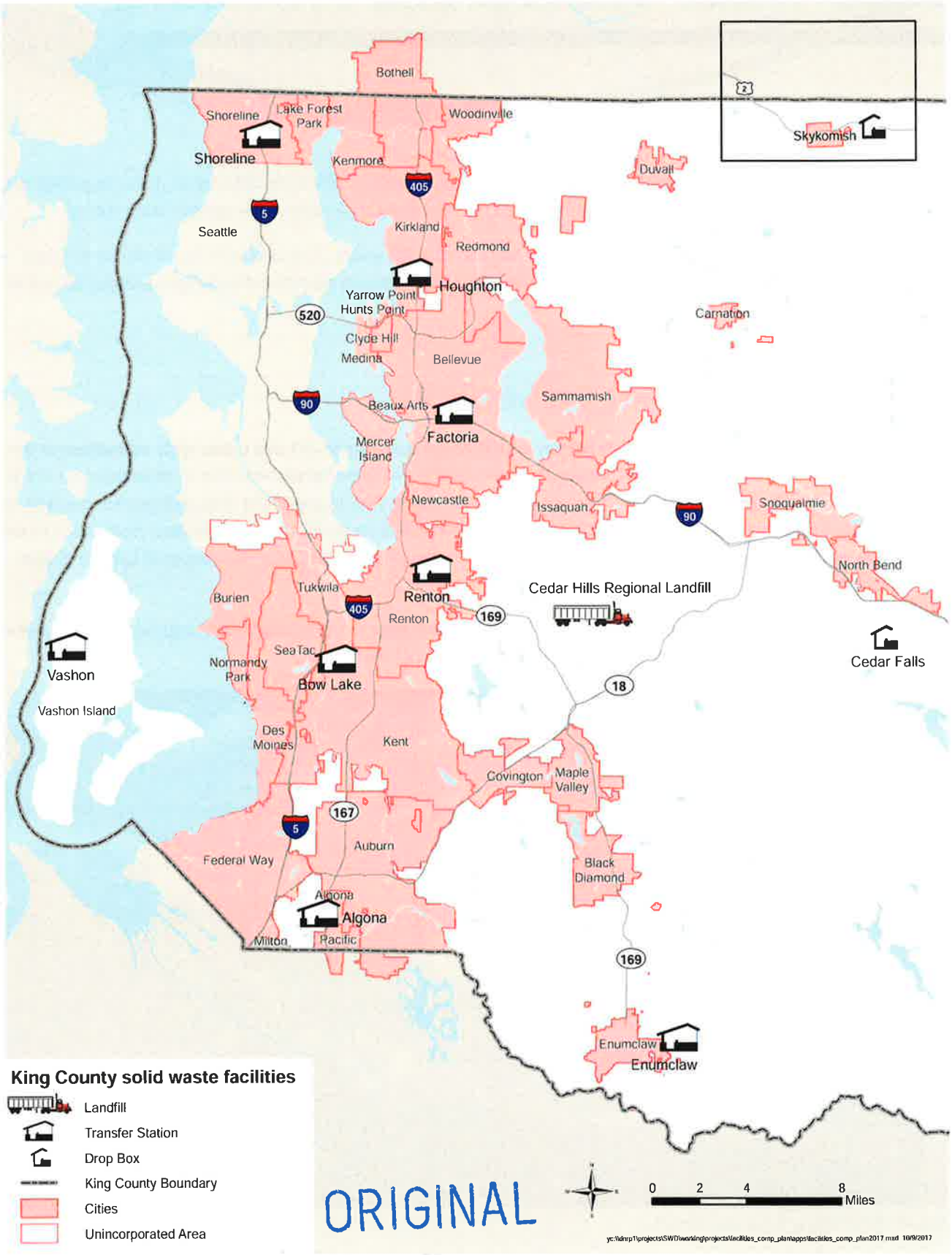

Table 5-1. Current facilities and services

Facility and Address by Area Served	Year Opened	Garbage Tons Received 2017	Recycling Tons Received 2017	Customer Transactions 2017[i]	Recycling and Other Services Provided	Transfer Plan Recommendation and Status
North County						
Shoreline Recycling & Transfer Station[ii] 2300 North 165th St Shoreline 98133	2008	57,619	15,927	101,013	Standard curbside recyclables[iii], appliances, bicycles and bicycle parts, clean wood, fluorescent bulbs and tubes, scrap metal, textiles, yard waste, flags, plastic film and plastic grocery bags, expanded polystyrene foam blocks and coolers, household sharps.	Replace First Northeast Transfer Station. Complete 2008.
Northeast County						
Factoria Recycling & Transfer Station 13800 SE 32nd St Bellevue 98005	2017	142,425	697	110,461	Standard curbside recyclables, scrap metal, textiles, appliances, clean wood, yard waste, household sharps, and moderate risk waste including recycling of batteries (household, vehicle or marine), fluorescent bulbs and tubes, thermometers and thermostats, propane tanks.	Replace Factoria Transfer Station. Complete 2017.
Houghton Transfer Station 11724 NE 60th St Kirkland 98033	mid-1960s	154,547	638	128,674	Standard curbside recyclables, textiles.	Close Houghton Transfer Station when replacement capacity is available. Process to review capacity needs starting in 2018.
Central County						
Bow Lake Recycling & Transfer Station 18800 Orillia Rd South Tukwila 98188	2013	285,874	8,023	212,035	Standard curbside recyclables, appliances, bicycles and bicycle parts, clean wood, scrap metal, yard waste, fluorescent bulbs and tubes, plastic film and plastic grocery bags,expanded polystyrene foam blocks and coolers, household sharps.	Replace Bow Lake Transfer Station. Complete 2013.
Renton Transfer Station 3021 NE 4th St Renton 98056	mid-1960s	64,569	721	87,456	Standard curbside recyclables, textiles.	Close Renton Transfer Station when replacement capacity is available. No decisions have been made regarding closure pending completion of the new South Recycling and Transfer Station and decisions for a potential Northeast Station.

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Facility and Address by Area Served	Year Opened	Garbage Tons Received 2017	Recycling Tons Received 2017	Customer Transactions 2017[i]	Recycling and Other Services Provided	Transfer Plan Recommendation and Status
South County						
Algona Transfer Station 35315 West Valley Hwy Algona 98001	mid-1960s	154,975	N/A	145,452	None.	Close Algona Transfer Station and replace it with a new South Recycling and Transfer Station. Site selected, anticipated opening date in 2023.
Rural County						
Cedar Falls Drop Box 16925 Cedar Falls Rd SE North Bend 98045	1990	3,820	704	20,903	Standard curbside recyclables, textiles, yard waste.	
Enumclaw Recycling & Transfer Station 1650 Battersby Ave East Enumclaw 98022	1993	24,169	2,163	53,601	Standard curbside recyclables, appliances, clean wood, scrap metal, textiles, yard waste, fluorescent tubes and bulbs.	
Skykomish Drop Box 74324 NE Old Cascade Hwy Skykomish 98288	1980	1,522	52	3,695	Standard curbside recyclables.	
Vashon Recycling & Transfer Station 18900 Westside Hwy SW Vashon 98070	1999	7,674	2,302	20,013	Standard curbside recyclables, appliances, scrap metal, textiles, yard waste, fluorescent tubes and bulbs, household and business generated sharps, construction and demolition debris[iv].	

[i] Only paid transactions are recorded.
[ii] Replaced the First NE Transfer Station.
[iii] Standard curbside recyclables are glass and plastic containers, tin and aluminum cans, mixed paper, newspaper, and cardboard.
[iv] Construction and demolition debris is accepted for disposal.

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Resource Recovery at Transfer Stations

Resource recovery is separation of recyclables that happens after disposed materials are received by the county. It is a growing aspect of division business. Historically, the division's recycling programs have been limited to source separation by curbside customers. However, since 70 percent of the materials brought to the transfer stations could be recycled, sorting out target materials can help reach recycling goals. The division is increasing its resource recovery efforts. Based on a successful pilot project that separated tons of recyclables at the Shoreline Recycling and Transfer Station, new staff were approved for expanded sorting of recyclables from mixed waste at the Shoreline, Bow Lake, and Enumclaw stations. Recycling bins are also provided near where self-haul customers unload their cars at those stations.

A Transfer Station Operator recovers cardboard from a mixed load of solid waste

In addition to providing the standard recycling services, Bow Lake, Enumclaw, and Shoreline Recycling and Transfer Stations have increased the amounts of cardboard, scrap metal, and clean wood recycled by actively removing these materials from mixed waste with use of an excavator and by providing additional staff to engage customers in the separation of recyclables from mixed waste loads at the point of disposal.

Materials Recovery by the Numbers

In 2017, additional staffing, recycling bins, and signage in the self-haul areas resulted in the recovery of 7,184 tons of cardboard, metal, and wood, an increase of 1,323 tons over 2016.

Materials Recovery (Additional Tons) April 1, 2014 - Dec 31, 2017

	2014	2015	2016	2017	Total
Bow Lake	0	1,160	2,814	3,426	7,400
Enumclaw	6	156	286	776	1,224
Shoreline	1,184	2,114	2,761	2,982	9,041
	1,190	3,431	5,861	7,184	17,666

Services for Moderate Risk Wastes

Many common household products, such as pesticides and certain cleaning products, contain ingredients that are toxic, flammable, reactive, or corrosive. Disposed improperly, these products, referred to collectively as moderate risk waste, can pose a threat to human health and the environment. Moderate risk waste generated in King County is managed through the Local Hazardous Waste Management Program (LHWMP). This program is jointly managed by

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King County, the City of Seattle, the 37 cities within our service area, and Public Health. The guiding policies and plans are contained in the joint *Local Hazardous Waste Management Plan* (Watson 2010), mandated under RCW 70.105.

The county accepts moderate risk waste from residents through two avenues: the traveling Wastemobile and the stationary drop-off site at the Factoria Recycling and Transfer Station. In addition, the City of Seattle operates two moderate risk waste collection sites within its borders, which are open to all King County residents. Wastes collected through these services are recycled, reused, or incinerated when necessary. None is disposed at Cedar Hills. Moderate risk waste collection for residents is funded through a surcharge on garbage disposal, residential and business garbage collection, and wastewater discharge fees. Residents and businesses using the services are not charged at the drop-off locations. Jurisdictions receive funds from the LHWMP to provide the service.

The moderate risk waste collection facility at the new Factoria Recycling and Transfer Station collects moderate risk waste from households and small businesses

Created in 1989, the county's Wastemobile was the first program of its kind in the nation. It is a mobile service that travels to communities within King County, staging collection of moderate risk waste at each site for two or three days at a time. The traveling Wastemobile had 21 events in 2017 that served 11,851 King County residents, collecting 272 tons of moderate risk waste. This represents a customer increase of five percent from 2016. The Wastemobile also provides a mobile moderate risk waste collection at The Outlet Collection Seattle (formerly the Supermall) in Auburn each Saturday and Sunday. In 2017, 235 tons of moderate risk waste were collected at this location from 9,481 customers, six percent more customers than used the service in 2016. The county's Factoria Recycling and Transfer Station offers moderate risk waste drop-off service six days a week. In September 2017, the new Factoria state-of-the-art moderate risk waste facility opened. It has more capacity and functionality than the previous facility did, enabling the division to effectively and safely collect hazardous waste. In 2017, a little over 13,000 customers brought 281 tons of moderate risk waste to Factoria.

Since 2008, Factoria and the Wastemobile have also accepted moderate risk waste from small businesses. In 2017, this program served 267 small-quantity generator business customers and collected 18 tons of moderate risk waste.

Collection of Sharps

Sharps are medical products, such as hypodermic needles, scalpel blades, and lancets, which require special handling to ensure their safe collection, transfer, and disposal. Without proper containment, sharps can pose a safety hazard to workers through potential exposure to blood-borne pathogens or other disease-causing agents. Within King County, the disposal of sharps is regulated by Title 10 of the Code of the King County Board of Health and by King County's Waste Acceptance Rule PUT 7-1-6(PR), 9/17.

Disposal of sharps in the general waste stream is prohibited. Separate, secure receptacles for sharps collection are provided for residents and small businesses at the Vashon Recycling and Transfer Station with prior authorization from the division's Special Waste Unit. Residents may also deposit home-generated sharps in separate, secure receptacles at the Factoria, Shoreline and Bow Lake Recycling and Transfer Stations. Business-generated sharps are not accepted

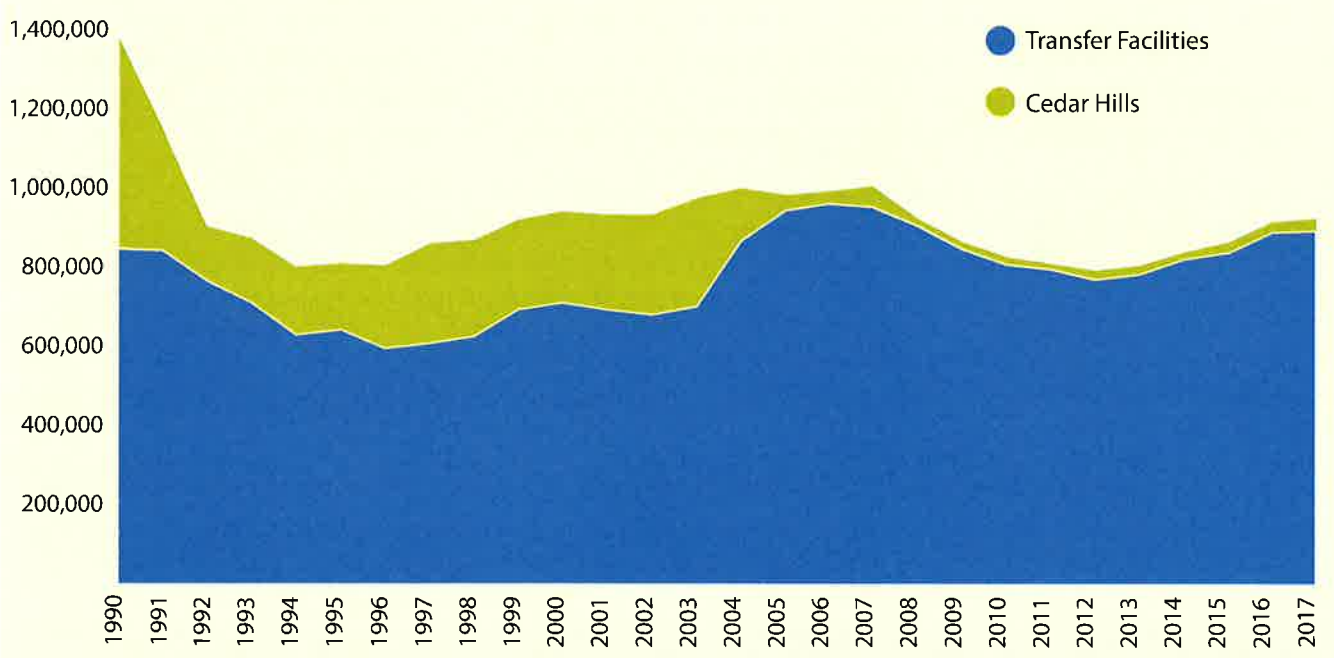
at the transfer facilities, except at Vashon with prior authorization from the Special Waste Unit. Sharps generated by medical facilities or businesses are accepted for disposal at Cedar Hills with prior authorization from the Special Waste Unit.

There are alternative methods for the proper management of sharps. For example, some health care providers and pharmacies will take back used sharps in pre-approved containers. There are also mail-in programs available.

Trends in Transfer Station Usage

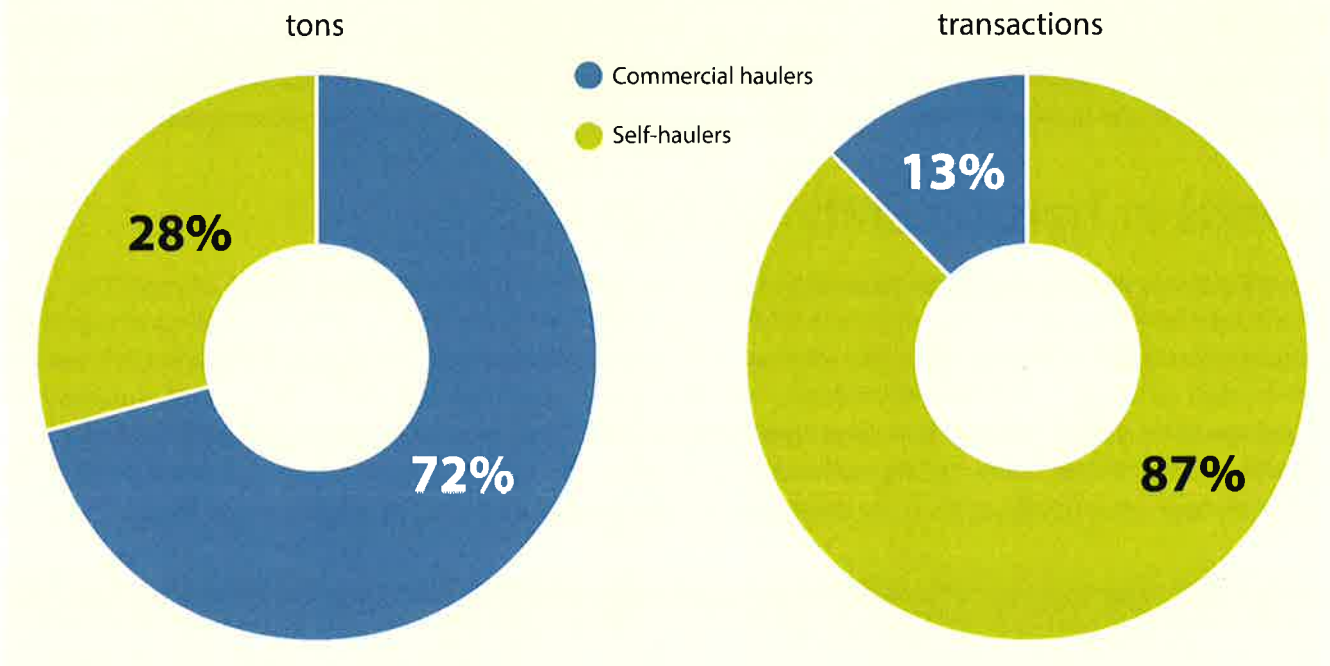
Figure 5-2 shows the tons of garbage received at the transfer stations and the landfill over the last 27 years. The drop in total tons disposed in the early to mid-1990s is attributable to the success of waste prevention and recycling programs that began in the late 1980s, the withdrawal of the City of Seattle from the county's system in 1991, and the ban on most construction and demolition debris from the division's solid waste system in 1993. In 2004, the amount of garbage taken directly to Cedar Hills decreased significantly due to an increase in the fee charged to commercial collection companies that were hauling wastes directly to the landfill. The economic downturn is primarily responsible for the tonnage reduction since 2007. The division does not expect a rapid return to earlier tonnage levels.

Figure 5-2. Total tons processed at transfer facilities and disposed at Cedar Hills (1990 - 2017)



Seventy-two percent of the garbage received at the transfer facilities in 2017 was brought by the larger, commercial collection trucks, with the remaining 28 percent delivered by business and residential self-haulers (shown in Figure 5-3). While the larger garbage loads come from the commercial haulers, self-haulers account for 87 percent of the customer transactions (Figure 5-3). At some of the urban stations that are operating at or near maximum capacity, the mix of self-haul and commercial customers can cause long traffic queues and crowded conditions on the tipping floor. Transfer station capacity depends on a number of variables such as the mix of collection trucks versus self-haulers, available tipping stalls for each, on-site queue capacity for each, and trailer loading ability (in the case of the

Figure 5-3. Percent of tons and transactions at transfer facilities by hauler type (2017)



older stations with no preload compactors). The division has managed these problems, to the extent possible at each station, by providing separate queuing lanes for the two customer types and allowing maximum separation on the tipping floor, for safety as well as efficiency. Crowding is somewhat eased by the fact that self-haulers typically use the stations more on weekends, while commercial transactions occur primarily on week days.

To understand who self-hauls to the transfer facilities and why, the division conducts periodic surveys of customers through on-site questionnaires at each facility. Self-haulers consist of single- and multi-family residents and non-residential customers, such as landscapers, small contractors, industries, offices, stores, schools, government agencies, and increasingly, independent haulers for hire. The most common type of self-hauler is the single-family resident.

Of the self-haul trips, about 88 percent are made by residential customers, who bring in about 75 percent of the self-haul tons. About 12 percent of the trips are made by non-residential self-haulers, bringing about 25 percent of the self-haul tons.

The number one material disposed by self-haulers is dimensional lumber (a subset of construction and demolition debris), followed by yard waste, other construction and demolition wastes, furniture, and scrap metal. The division's waste characterization studies indicate that approximately 70 percent of the materials disposed by self-haulers are recyclable.

Planning Capacity at New Recycling and Transfer Stations

New recycling and transfer facilities are being designed to safely and efficiently serve both commercial and self-haul customers. When a new station is designed, maximum capacity is not targeted to occur when the station opens, but is dependent upon vehicular projections into the future, usually 20 - 30 years. The mix of traffic and tonnage on weekends and weekdays varies significantly, so it is usually vehicular capacity on weekends that drive queue length, number of tip stalls, and therefore overall size of the facility. On weekdays, tonnage drives the operation of a station.

Waste characterization studies conducted at transfer stations also survey self-haulers on-site at the transfer facilities (Cascadia 2016). The most common reason for transfer station visits was "large amount of garbage"(18 percent). Other primary reasons for self-hauling included, "items too big to fit in garbage can," (16 percent) "cheaper or saves money"(14 percent), "other"(10 percent), and "cleaning home or workplace"(nine percent). The most frequent response from nonresidential customers was "large amount of garbage" (26 percent).

Evaluation and Planning for the Urban Transfer Stations

The county's implementation of the *Solid Waste Transfer and Waste Management Plan* (Transfer Plan) is underway to renovate the aging transfer system to better serve its customers. This investment in the transfer system will help the division meet demands created by the growth in population since Cedar Hills began accepting waste in the mid-1960's, by technological changes in the industry, and by ongoing advances in the recycling and salvage of materials from the waste stream.

The Algona Transfer Station was built in the mid-1960's

The Planning Process

Since 1992, continuing growth in the county and technological changes in the industry have intensified the need for significant improvements and updates to the division's infrastructure. The 2001 *Comprehensive Solid Waste Management Plan* (2001 Plan) reasserted the need for an updated transfer system (KCSWD 2002). Given the scope of changes anticipated, both the cities and the county recognized the need for a more coordinated approach to the planning and decision-making process. In 2004, the County Council adopted Ordinance 14971, which prioritized evaluation of the urban transfer station network as an integral part of the waste management plan and established a process for collaborative participation by the cities in solid waste planning.

Codified in KCC 10.25.110, Ordinance 14971 outlined an iterative process of analysis and reporting that would culminate in a plan containing recommendations for upgrading the solid waste system. The ordinance also established a forum for cities, division, and County Council staff to collaborate on solid waste planning through the advisory committees – the Solid Waste Advisory Committee (SWAC) and the Metropolitan Solid Waste Management Advisory Committee (MSWMAC). The legislation also created the Interjurisdictional Technical Staff Group (ITSG) to assist MSWMAC with its work. ITSG included staff representatives from the cities, County Council staff, and the division. The group was very active during the initial stages of data gathering and analysis for the planning process, but is no longer meeting. Much of the initial work was to evaluate the whole system and develop recommendations that would help inform and guide the direction of this Plan.

Along with division staff, the committees first analyzed various aspects of the solid waste system through four iterative milestone reports. These reports identified the need to renovate the county's urban transfer facilities by evaluating the

current conditions of each facility, discussed options for public and private ownership and operation of solid waste and recycling facilities, and identified packaged alternatives for the future configuration of the transfer station network.

These four milestone reports culminated in the Transfer Plan, which provides recommendations for upgrading the transfer station system and services; methods for extending the lifespan of Cedar Hills; and options for preparing the landfill for eventual closure. Through the process of analysis and reporting, the division's stakeholders had a significant role in shaping the recommendations in the Transfer Plan. At the conclusion of the process, they communicated their support of the plan to the King County Executive and the County Council.

Before final approval of the Transfer Plan, the County Council requested an independent third-party review of the Transfer Plan. The review was conducted by the firm Gershman, Brickner & Bratton, Inc., who fully supported the primary objectives of the plan to modernize the transfer station system and maximize the lifespan of the Cedar Hills landfill. Based on Gershman, Brickner & Bratton's review and the support of both SWAC and MSWMAC, the County Council unanimously approved the Transfer Plan in December 2007.

In 2012, as the division moved to implement the Transfer Plan, several cities raised questions about how changes in core planning assumptions may call for a change in if/how to proceed with the replacement of the Algona, Factoria, and Houghton transfer stations. With a lower tonnage forecast than was predicted in 2006 when the Transfer Plan was agreed to, and the indication that five cities were going to exit the system in 2028 resulting in an additional drop of system tonnage, it was decided to conduct a Transfer Plan Review, starting in 2013. At the end of that process, it was confirmed that a new Factoria Recycling and Transfer Station should be built and siting for a new South County Recycling and Transfer Station should continue. However, siting for a new Northeast Recycling and Transfer Station was postponed while alternative options were explored.

In 2014, Council Motion 14145 directed the division, in collaboration with stakeholders, to continue to evaluate a mix of capital facilities and operational approaches to address system needs over time, including implementing operational approaches such as transaction demand management strategies that would provide service for the northeast county without building an additional transfer station; and to compare trade-offs and benefits with the Transfer Plan.

The division transmitted a final report to the County Council on June 30, 2015 as directed by Motion 14145. The report reaffirmed that the siting process for the South County Recycling and Transfer Station should continue, but that the siting process for the Northeast Recycling and Transfer Station should be postponed. Instead, the report recommended that the division conduct a demand management pilot to test whether instituting longer

The new Factoria Recycling and Transfer Station opened in the fall of 2017

hours and peak pricing at the Factoria Transfer Station would influence customers to either use the station at different hours or to use another station. During lengthy discussions with the division, advisory committees raised numerous concerns about the demand management pilot, including its impact on service levels, traffic, and regional equity.

In 2017, with the city of Bellevue signing the *Amended and Restated Solid Waste Interlocal Agreement* (Amended and Restated ILA), and higher tonnage than was forecast in 2014 coming into the system, the county concluded that the demand management pilot as planned would likely not be effective. County Council Ordinance 18577 and accompanying Motion 14968 canceled the demand management pilot and initiated a further planning effort for transfer capacity in the Northeast service area. The legislation allocated one million dollars to planning work to assess waste transfer capacity needs in the Northeast area of King County and options to meet these needs. It also directs the division to plan for needed transfer station capacity in the Northeast area that would be in addition to the existing Factoria Recycling and Transfer Station. By early 2018, the remaining four cities, Clyde Hill, Hunts Point, Medina and Yarrow Point, also signed the Amended and Restated ILA.

Service Level Evaluation Criteria

In the first milestone report (KCSWD and ITSG 2004), the division and advisory committees developed 17 criteria to evaluate the urban transfer facilities. To determine the appropriate standards of performance, the division consulted the local commercial collection companies and other experts, and applied national environmental and transportation standards. Details on the application of these evaluation criteria to individual facilities are contained in the second milestone report prepared by the division and advisory committees and approved by the County Council (KCSWD 2005a). Criteria to address costs and rate-setting considerations were applied during the development of system alternatives in the final milestone report (KCSWD 2006a).

The evaluation criteria were applied to five of the six urban stations – Algona, Bow Lake, Factoria, Houghton, and Renton. The former First Northeast station was not evaluated because it was in the process of being rebuilt. The rebuilt station opened in 2008 as the Shoreline Recycling and Transfer Station. These criteria were again evaluated and confirmed as appropriate during the 2013/14 Transfer Plan Review process. They provide guidance for evaluating existing stations and designing new ones, but the facility site and other constraints may mean that new facilities do not entirely meet all criteria.

For the urban station evaluations, the 17 criteria were grouped into three broad categories – level of service to customers, station capacity and structural integrity, and effects on surrounding communities. As expected for these five aging facilities, the majority of the criteria were not met, resulting in decisions to reconstruct or close the stations when sufficient replacement capacity was available.

The three categories of evaluation criteria are described below:

Level of Service

- *Estimated travel time to a facility* – This criterion measures how conveniently located the facilities are for customers, measured by the maximum travel time to the closest facility in their service area. The standard was established as 30 minutes for at least 90 percent of the customers. It provides an indication of whether the transfer stations are well dispersed throughout the county.
- *Time on site* – Time on site measures the time to get in and out of the station, including unloading time. It was evaluated separately for commercial haulers (with a standard of 16 minutes) and business and residential self-

haulers (each with a standard of 30 minutes). It provides an indicator of whether a transfer station can handle customers efficiently.

- *Facility hours* – Individual days and hours of operation for each station are based on the division's usage data and customer trends. Some of the urban stations are open in the early morning or late evening hours to serve the commercial haulers. Currently, the only days that the entire system is closed are Thanksgiving, Christmas, and New Year's Day.

- *Level of Recycling Services* – The final criterion in this category was whether recycling services provided at the stations met the waste prevention and recycling policies established in the *2001 Comprehensive Solid Waste Management Plan*. In general, the policies directed that all stations should 1) provide for collection of the curbside recyclables, including glass and plastic containers, tin and aluminum cans, mixed waste paper, newspaper, and cardboard, 2) where feasible, provide areas for source-separated yard waste collection, and 3) maintain the capacity to add collection of new materials based on market opportunities and community needs.

Station Capacity

Station capacity is likely the single greatest limitation of the five urban transfer stations, both now and in the future. It was measured using a number of criteria that affect daily operations, future expansion, and emergency capacity.

- *Vehicle and tonnage capacity* – Two major operational considerations measured were station capacity for vehicle traffic and solid waste tonnage, both at the time of the study and over the 20-year planning horizon. Optimal operating capacity is the maximum number of vehicles and tonnage that can be efficiently processed through the station each hour based on the station design and customer mix. To derive criteria that would indicate how well a station could be expected to perform, the division modeled its criteria after the transportation standards used to measure roadway capacity. The transportation standards were modified to assign measures of capacity to transfer facilities. The optimal level of service was defined as "able to accommodate vehicle and tonnage throughput at all times of the day, except for occasional peak hour times. Based on the criteria, a station that provides the optimal level of service more than 95 percent of the time is considered underutilized, meaning it offers more capacity than required for the area it serves. A level of service in which capacity is exceeded during only 5 to 10 percent of operating hours is considered optimal.

Recycling at the Enumclaw Recycling and Transfer Station

- *Space for three days' storage* – Available storage capacity establishes whether a transfer station can continue to operate, or accept garbage, for at least three days in the event of a major regional disaster.

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- *Space for station expansion* – Stations were evaluated to determine 1) whether there is space for expansion on the existing property or 2) whether there is adjacent land available on which to expand operations. These two standards were used primarily to determine if the station could be expanded in its current location or if a new location would be needed to efficiently manage current and future needs.

- *Meets facility safety goals* – While all stations hold current permits from Public Health and meet health and safety standards, overall safety is a concern as stations become more congested and operations more constricted. The presence of these physical challenges at the stations does not mean they operate in an unsafe manner; it does mean that it takes extra effort by staff and management at the stations to ensure the facilities are operating safely.

- *Roof clearance* – This criterion measures a station's capacity to handle the larger commercial collection trucks. Through discussions with the commercial collection companies, it was determined that a minimum clearance of 25 feet was needed to allow the new, larger trucks to unload efficiently. The longer truck/trailers with automated lifts, which allow the garbage to slide out the back of the trailers, require higher vertical clearance than trucks did in the past. Before impovements were made to some of the older stations, the collection trucks could hit and potentially damage station roofs, supporting structures, or hanging lights as they unload.

The roof at the Houghton Transfer Station was raised in 2012 to accommodate larger trucks

- *Ability to compact waste* – This criterion examines whether the station is equipped with, or has the space to install, a waste compactor. Waste compactors increase efficiency and reduce costs by compressing more garbage into fewer loads for transport to the landfill or other disposal option. When garbage has been compacted, transfer trailers can carry about one-third more tons per trip, resulting in less traffic, less wear on local roads, less fuel use, and a reduction in greenhouse gases.

- *Structural integrity* – The purpose of this criterion is to ensure the facility meets code requirements for seismic, wind, and snow events. All facilities were constructed in compliance with the applicable standards of the time and were grandfathered in their current condition and presently meet the "life safety" standard, meaning the station would not endanger occupants in the event of an emergency. The current standard for assessing new transfer buildings for seismic performance is the Immediate Occupancy standard, developed by the Federal Emergency Management Agency (FEMA). This standard means that the facility could be occupied immediately following a seismic event. Because the *King County Emergency Management Plan* identifies transfer stations as critical facilities in the event of an emergency, this FEMA standard applies to all new stations.

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Effects on Surrounding Communities

One of the division's highest priorities is to minimize the effects of its facilities on host cities and surrounding communities. Through its advisory committees and meetings with cities, the division works to understand city and community issues and concerns and bring their perspectives to system planning. Working together, five criteria were developed to evaluate effects on communities.

- *Meets applicable local noise ordinance levels* – This criterion is to ensure that a facility does not violate state or local (city) standards for acceptable noise levels. State and city standards are based on maximum decibel (dBA) levels that consider zoning, land use, time of day, and other factors. Evaluations were based on the existence of any reports of noise violations to the cities and additional noise level measurements performed at each station by a consultant.

- *Meets Puget Sound Clean Air Agency standards for odors* – The primary measure of odor issues is complaints by the public or employees. Complaints are typically reported to the Puget Sound Clean Air Agency (PSCAA) or directly to the division. Complaints to PSCAA are verified by an inspector. If an odor is verified and considered to be detrimental, PSCAA issues a citation to the generator of the odor. The division also tracks and investigates odor complaints.

- *Meets goals for traffic on local streets* – This criterion measures the impacts on local streets and neighborhoods from vehicle traffic and queuing near the transfer stations. The area that could be affected by traffic from self-haulers and commercial collection trucks extends from the station entrance to the surrounding streets. The division hired a consultant to evaluate this criterion based on two standards: 1) that additional traffic meets the local traffic level of service standard as defined in the *American Association of State Transportation Officials Manual* and 2) that traffic does not extend onto local streets during more than 5 percent of the station's operating hours.

- *Existence of a 100-foot buffer between the active area and nearest residence* – This criterion calls for a 100-foot buffer between the active area of the station and the nearest residence.

- *Compatibility with surrounding land uses* – The final criterion used to evaluate the stations was the most subjective and difficult to apply. It looks at consistency with land use plans and zoning regulations, aesthetics, and compliance with state and local regulations. This criterion was evaluated for each station during lengthy discussions between the division and its advisory committees.

Since the level of service criteria were first applied to the transfer stations in 2005, the division has made changes and upgrades to the system. New recycling and transfer stations have been completed at Bow Lake and Factoria, and the roofs at Houghton, Algona and Renton were raised to meet the roof clearance standard. In 2017, the division applied selected criteria to the transfer stations again, using the current system conditions and an updated tonnage forecast. Table 5-2 presents the updated results for criteria that could be affected by these changes. Although the Shoreline station was not part of the original analysis, it is included in the update for reference.

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Table 5-2. Key service level criteria applied to urban transfer stations

		Algona	Bow Lake	Factoria	Houghton	Renton	Shoreline
2. Time on site meets standard for 90% of trips							
a. commercial vehicles	< 16 min = yes	NO	YES	YES	NO	NO	YES
b. business self-haulers	< 30 min = yes	YES	YES	YES	YES	YES	YES
c. residential self-haulers	< 30 min = yes	YES	YES	YES	YES	YES	YES
4. Recycling services . . . meet policies in 2001 Solid Waste Plan							
a. business self-haulers	YES/NO	NO	YES	YES	NO	NO	YES
b. residential self-haulers	YES/NO	NO	YES	YES	NO	NO	YES
5. Vehicle Capacity							
a. meets current needs	YES/NO	NO	YES	YES	YES	YES	YES
b. meets 20-year forecast needs	YES/NO	NO	YES*	YES*	NO	NO	NO
*This is very close; the result is within .5 percent of meeting the criteria.							
6. Average daily handling capacity (tons)							
a. meets current needs	YES/NO	YES	YES	YES	NO	YES	YES
b. meets 20-year forecast needs	YES/NO	NO	YES	YES	NO	YES	YES
7. Space for 3 days storage							
a. meets current needs	YES/NO	NO	YES	YES	NO	NO	YES
b. meets 20-year forecast needs	YES/NO	NO	YES	YES	NO	NO	YES
11. Ability to compact waste							
a. meets current needs	YES/NO	NO	YES	YES	NO	NO	YES

Remaining criteria not listed above includes:

1. Maximum Time to a Transfer Facility
- a. meets current needs
- b. meets 20 year forecast needs

3. Facility hours meet user demand

8. Space exists for station expansion
- a. inside the property line
- b. on available adjacent lands through expansion

9. Minimum roof clearance of 25 feet

10. Meets facility safety goals

12. Structural integrity
- a. Meets goals for structural integrity
- b. Meets FEMA immediate occupancy standards

13. Meets applicable local noise ordinance levels

14. Meets PSCAA standards for odors

15. Meets goals for traffic on local streets
- a. Meets LOS standard
- b. Traffic does not extend onto local streets 95% of time

16. 100 foot buffer between active area & nearest residence

17. Transfer station is compatible with surrounding land use

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Plans for the Urban Transfer Stations

Based on the application of evaluation criteria, the division and its advisory committees developed a plan to modernize the transfer system, including the addition of waste compactors and other changes needed to provide efficient and cost-effective services to the region's customers.

Activities approved by the County Council in the Transfer Plan include the following:

Bow Lake – deconstruct the existing transfer station and construct a new recycling and transfer station on the existing site and adjacent property - complete,

Factoria – deconstruct the existing transfer station and construct a new recycling and transfer station on the existing site and adjacent property - complete,

Algona – close the station after it is replaced by a new recycling and transfer station in the South County area – site selected,

Houghton – close the station when replacement capacity is available at a new Northeast recycling and transfer station, and

Renton – close the station when replacement capacity is available.

Although approved for closure, this Plan recommends reserving the option to retain the Renton station in some capacity, should its closure leave Renton and surrounding rural areas underserved. After the new transfer stations have been completed, the impact of closure can be fully evaluated. Table 5-3 shows the planned changes for the urban transfer stations and the two areas identified for construction of new stations.

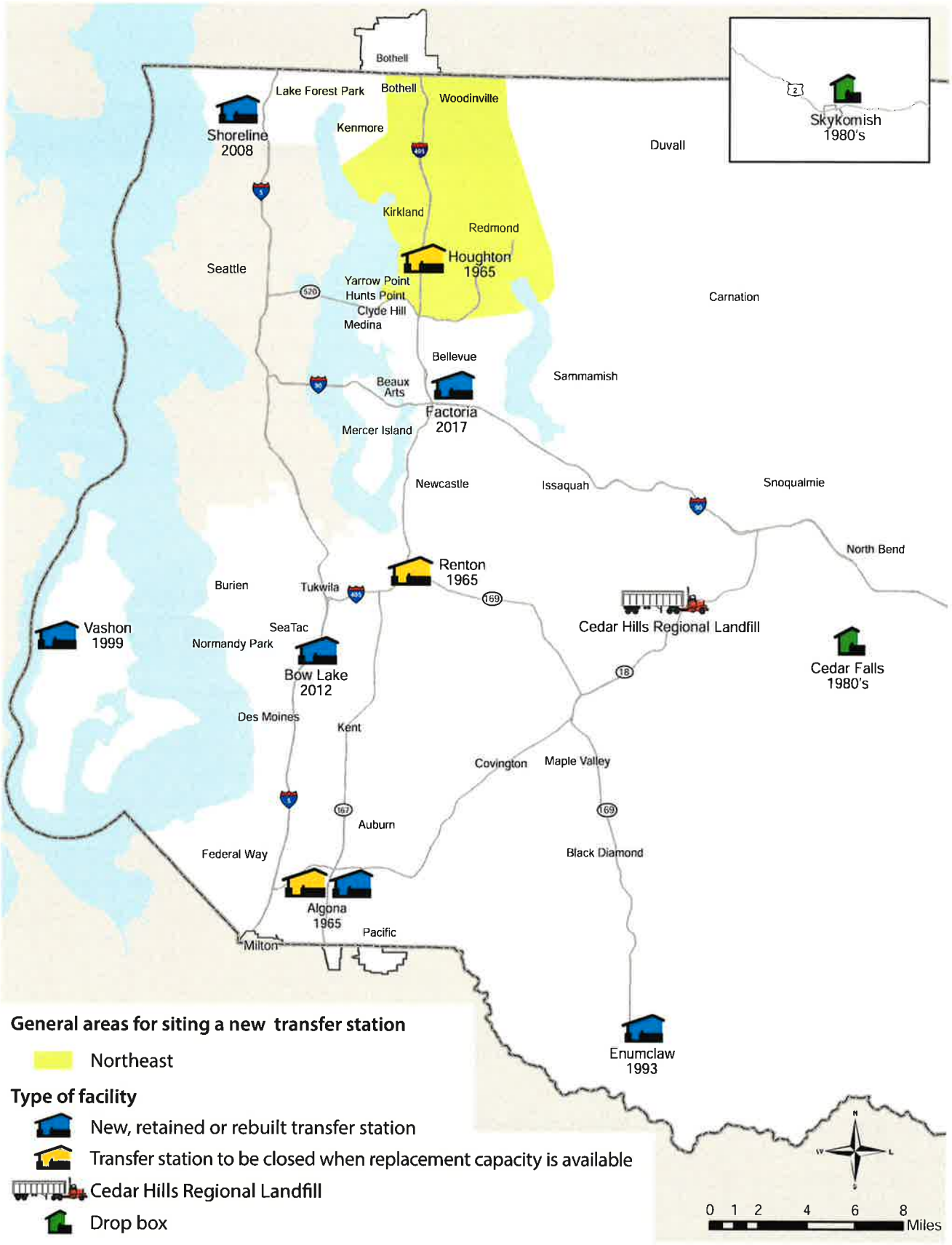
The new Bow Lake Recycling and Transfer Station is located on the site of the old Bow Lake Transfer Station and on adjacent property purchased from the Washington State Department of Transportation. During construction, the facility remained open to commercial haulers and self-haulers. The new transfer building opened in July 2012, immediately followed by deconstruction of the old transfer building to make way for an expanded recyclables collection area and new scale house. The station was completed in 2013.

The new Factoria Recycling and Transfer Station was built on the existing site and adjacent property purchased by the division for construction of the new facility. The old station remained open as the new transfer building was constructed. Once the new building was complete, the old building was deconstructed to make room for the stationary moderate risk waste facility and recyclables collection area. The new facility was completed in late 2017, cost approximately 90 million dollars, and will not be expanded on the upper Eastgate Way property near the Factoria Recycling and Transfer Station per Ordinance 18577 and accompanying Motion 14968.

A new South County station, estimated to cost about 113 million dollars, will replace the current facility in Algona on a site just north of the existing station. A new Northeast Recycling and Transfer Station is recommended, with an estimated cost of approximately 133 million in 2017 dollars. Initial planning for Northeast area transfer capacity is underway with more substantive work toward a new Northeast Recycling and Transfer Station anticipated after Plan approval in 2019.

All new stations will be built to similar standards of service and sustainability as the Bow Lake, Factoria, and Shoreline Recycling and Transfer Stations. There will be differences to accommodate community needs (e.g., Factoria retained a stationary moderate risk waste facility), and each station will be appropriately sized and designed to meet tonnage and customer requirements. All stations will have improved capacity, waste compactors, and additional space for collection of recyclable materials. The capacity to accept yard waste and other recyclables from commercial collection companies and to sort and remove recyclables from mixed loads will also be considered for new transfer facilities. For each new station, the division will seek the highest appropriate environmental certification as mandated by the County Green Building Ordinance.

Figure 5-4. Locations of existing and planned solid waste facilities



The timeline for completing the siting, design, construction, and closure of the urban transfer stations is shown in Table 5-3.

Table 5-3. Timeline for the facility renovation plan

	2017	2018	2019	2020	2021	2022	2023	2024	2025
Factoria	open								
South	siting		design and permit		construction		open		
Algona							close		
Northeast	planning			siting		design and permit		construction	open
Houghton									close
Renton[1]									close or modify operations

1 Division recommends reserving the option to retain the Renton Transfer Station in some capacity.

Transfer Facility Siting

As described earlier in this chapter, the need for new transfer facilities was identified through a comprehensive analysis of the transfer system network, with extensive involvement from the division's advisory committees. While general areas for site locations were identified (Figure 5-4), specific sites or specific site selection criteria were not.

The siting of a transfer facility is based on the technical requirements of operations and site constraints, such as site size and shape; however, a successful siting effort must also be tailored to address the needs and concerns of the service area communities. Many of the already renovated stations were rebuilt on the same site that the old station was built on in part due to the challenges finding a suitable site in the urban area. The siting process involves a number of steps – from development of site selection criteria to final selection of a site – and public involvement plays an important role each step of the way. The following section describes how the division implemented the standards and practices developed for transfer station siting during the planning process in its search for a new south county facility site. A similar process adapted to the needs of Northeast area communities will be used to site a new northeast county facility.

Siting a New South County Recycling and Transfer Station

The search for a site to replace the Algona Transfer Station with a new South County Recycling and Transfer Station began in 2012. The new station will serve the same communities that are served by the current Algona station – Algona, Auburn, Federal Way, and Pacific.

A Siting Advisory Committee (SAC) was formed to advise the division from a community and system-user perspective by identifying community concerns and impacts, developing criteria used to evaluate potential sites, and expressing opinions and preferences. SAC members included representatives from cities, local agencies and businesses, chambers of commerce, school districts, commercial garbage and recycling collection companies, transfer station users, environmental and neighborhood groups, tribes, and interested citizens.

In addition to forming a SAC, the division worked to ensure that members of the communities to be served by the new station were aware of the project, were able to receive information about the project, and had opportunities to give input on the project. Public information efforts to non-English speaking communities included translating public information materials into Spanish, Russian, and Korean and providing translators at public meetings. In addition, the division conducted an initial Equity Impact Review (see text box for more information) to provide more information about the communities surrounding the potential sites.

After an extensive site selection process and the completion of an Environmental Impact Statement (EIS), the County selected a site at 35101 West Valley Highway South, Algona, WA which is just north of the existing station. As indicated in Table 5-3, the next phase of this project, design and permitting, will be undertaken in the next two years, followed by another two years of construction. It is anticipated that the existing Algona Transfer Station will continue to operate until the new station is complete. At that point, the old station will close. Up-to-date information about the South County Recycling and Transfer Station project can be found on the division's website: *www.kingcounty.gov/depts/dnrp/solid-waste/facilities/algona.aspx.*

The Equity Impact Review

The Equity and Social Justice Strategic Plan 2016-2022 (King County 2016b) establishes a goal to "Develop facility and system improvements responsive to the values and priorities of residents and stakeholders and achieve pro-equity outcomes." The purpose of the Equity Impact Review is to fulfill that goal and to ensure that equity impacts are considered during the siting, design, and operation of a new facility. It is a process to identify, evaluate, and communicate the potential impacts on equity – both positive and negative – of the project. There are five phases of the Equity Impact Review which correspond to the different stages of the project. For instance, an initial Equity Impact Review was conducted during the siting of the South County Recycling and Transfer Station. The review determined the populations that would likely be impacted by the project and what the impacts might be. An expanded Equity Impact Review that will address approaches that will best meet community priorities and concerns will be an integral part of the design and operation of the facility.

Providing Transfer Capacity in the Northeast Service Area

As early as the 1992 Comprehensive Solid Waste Management Plan, the Houghton Transfer Station was identified as being in need of replacement. Throughout the years, subsequent evaluations and studies, including the Transfer Plan, confirmed the need for a new station and the closure of the old one. The existing Houghton station was constructed in the mid-1960s on 8.4 acres of land. The station is bordered by the closed Houghton landfill on the north side, Bridle Trails State Park on the south side, and private homes on the east and west sides. The station has an open-sided, direct-dump style transfer building, a scalehouse, a modestly-sized no-fee recyclables collection area for a limited range of materials, and trailer parking areas.

A New Northeast Recycling and Transfer Station is Recommended

Although previous plans recommended a new station, a Northeast station decision was not finalized, offering the opportunity to re-evaluate transfer needs as part of this plan. County Ordinance 18577 directed that this plan "... must address current waste transfer needs in the Northeast area of King County and how those needs are proposed to be met." The Public Review Draft Plan issued in January 2018 identified three options to meet Northeast area

transfer needs: 1) Houghton station "as is," 2) site and build a new Northeast recycling and transfer station, and 3) a combination of existing and/or new facilities.

After public comment and careful consideration of the three options, the option to site and build a new Northeast recycling and transfer station is recommended, with the Houghton station to be closed after the new station is complete. The location, services offered, and financial and transportation impacts to the community are components of providing regional equity in transfer services in the Northeast service area. A new station will provide similar services in the Northeast service area that updated transfer stations in other urban service areas now provide. The Northeast area is among the fastest growing parts of the county and was the third busiest station in terms of both tons and transactions in 2017. A new station will meet key levels of service to accommodate current and future tons and vehicles, both on a daily basis and when emergencies require extra storage. It would include compaction which could decrease truck traffic from the station to the landfill by almost a third. It would be designed to move customers through the station efficiently, reducing customer disposal time. It also would allow for full service recycling to help meet county goals. A new station is the highest cost option, but its costs are in line with the cost of modern stations recently built in other parts of the urban area. Siting a new station could take time and generate host community opposition.

Initial planning for Northeast area transfer capacity is underway with more substantive work toward a new Northeast Recycling and Transfer Station anticipated after Plan approval in 2019. The division will use experience gained in siting the South County Recycling and Transfer Station to refine its approach to understanding capacity needs, evaluating potential sites, and involving the community. Criteria for any facility that might ultimately be built in the Northeast service area would be developed with members of that community. A first step in this process will be a dialogue to understand the needs and concerns of all of the stakeholders in the northeast service area.

Other Northeast Capacity Options Considered

The Houghton station "as is" and a combination of facilities, described below, were considered as options in the Public Review Draft Comp Plan, but are not recommended as the best way to provide transfer capacity in the Northeast service area.

Keep Existing Houghton Station Open

This option would keep the existing station open indefinitely and largely in its current condition. This option is the "no action" or status quo alternative to addressing transfer capacity in the Northeast service area. It would be the least expensive option but would continue to provide lower levels of service for the Northeast compared to other urban parts of the County system. Recycling options would be limited, compaction to reduce truck traffic would not be available, and there would not be enough space to efficiently accommodate the future tons and numbers of customers. Host city concerns about continued operation of the open sided station adjacent to a residential neighborhood would continue.

Combination of Facilities

This option would use a combination of facilities to meet transfer capacity needs based on expected population and employment growth, transportation corridors and other criteria to determine the types and sizes of transfer stations needed to serve the area. It would consider various combinations of facilities to meet transfer capacity needs. For example, one combination that was used to develop the comparison in Table 5-4 would be to leave the existing Houghton Transfer Station open to serve only self-haulers and site and build a separate facility elsewhere in the service area to serve commercial haulers. Although this option could meet more level of service targets than the Houghton station alone, it carries some of the challenges of both the Houghton "as is" option (continued open sided station, limited space) and the new NE station option (siting a new facility, potential host community opposition).

Table 5-4 Comparison of key characteristics of three transfer options considered

Comparative Attribute	Houghton "As Is"	Northeast Recycling and Transfer Station	Combination of Facilities
Total cost per Ton (2029)[1]	$2.39	$13.11	$9.79
GHG Reductions from Transfer Station Recycling (2029)[2]	(2,165 MTCO2e)	(32,098 MTCO2e)	(28,802 MTCO2e)
Level of Service[3]	Will not meet any of the 6 key level of service criteria.	Will meet all 6 key level of service criteria.	Will not meet all 6 key level of service criteria.
Recycling	Curbside mix, textiles, and cardboard.	Curbside mix, textiles, cardboard, clean wood, scrap metal, yard waste, appliances, and other recyclables TBD.	Curbside mix, textiles, cardboard, clean wood, scrap metal, and yard waste.
Risks	• Limited recycling and flexibility for the system in the future, and • Host city opposition.	• Siting a new station may take time and be costly, and • Potential host city opposition.	• Limited recycling and flexibility for the system in the future, • Siting a new station, and • Potential host city opposition.

1 Cost includes both capital and operating costs. Previous estimates of cost per ton and impact on the curbside rate only included capital costs

2 Using WARM model, calculates the GHG reduced by recycling at the station

3 Key level of service criteria: Time on site, Recycling services offered, Vehicle capacity, Average daily handling capacity (tons), Space for 3 days storage, and Ability to compact waste

Evaluation and Planning for the Rural Transfer Facilities

Historically, the rural areas were served by small community landfills. As those landfills closed, most were replaced by either a transfer station or a drop box. The Duvall and Hobart (near Maple Valley) landfills were closed without replacement. Currently, rural King County is served by two recycling and transfer stations, in Enumclaw and on Vashon Island; and two drop boxes, in North Bend (Cedar Falls) and Skykomish.

The Vashon Recycling and Transfer Station

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In 2007, the division applied the same 17 criteria used for the urban stations to the rural facilities. Because the drop boxes are essentially collection containers covered by roof structures, there is no building per se to evaluate, so many of the criteria did not apply. Criteria specific to the rural system were not developed because a preliminary look indicated that the rural facilities, for the most part, met the standards set for the urban system, although they may be open for fewer hours and days. To provide an appropriate level of service to area residents and the commercial collectors, the division periodically reviews the operating hours of rural facilities and makes adjustments as needed.

The Enumclaw Recycling and Transfer Station, which opened in 1993, serves the City of Enumclaw and southeastern King County. The City of Enumclaw provides its own garbage collection service and takes the wastes to the transfer station. The station offers a wide variety of recycling opportunities and is equipped with a waste compactor. This station met all of the evaluation criteria, with the capacity to provide a wide range of services and the flexibility to respond to future needs.

The Vashon Recycling and Transfer Station opened in 1999 to serve residents and businesses on Vashon Island. This station also met all of the evaluation criteria. It accepts a wide range of recyclables and is also equipped with a waste compactor. Because of its remote island location, the facility accepts some construction and demolition materials and special wastes for disposal that the other stations do not. The division partnered with Zero Waste Vashon, a community group focused on finding practical ways to recycle waste, to conduct a pilot program to collect yard waste mixed with food waste. The program started in October 2015 and was made permanent in 2016. The division will continue to partner with Zero Waste Vashon to find solutions to managing Island waste in a cost effective and environmentally appropriate fashion.

The drop boxes are scaled-down facilities, designed to provide cost-effective, convenient drop-off services in the more remote areas of the county. The Cedar Falls Drop Box, which opened in 1990, serves self-haulers in the North Bend area. It has three containers – two for garbage and one for yard waste – and provides a collection area for some recyclables. This facility met all applicable evaluation criteria except for vehicle capacity, which is primarily due to heavy weekend use. Currently, the same scale is used by both inbound and outbound traffic, which can lead to backups on weekends when the station is most busy. The division is considering a number of improvements to this facility, including a second scale to address heavy weekend use, another container for garbage or yard waste collection, and expanded recycling opportunities.

The most remote facility operated by the division is a drop box in the Town of Skykomish. Built in 1980, the drop box serves Skykomish and the communities of Grotto and Baring. Skykomish provides its own garbage collection service and takes the wastes to the Skykomish Drop Box. The drop box is also used by self-haulers, who can bring garbage and recyclables to the facility. The Skykomish facility is unstaffed; payment is made at an automated gate using a credit or debit card or pre-paid solid waste disposal card. There are cameras at the site to monitor activities, and division staff makes regular visits to the site to perform maintenance. In addition, the King County Road Services Division has a facility

The Skykomish Drop Box

next door, from which Road's staff help monitor the site. The drop box met all the applicable evaluation criteria and appears to provide an appropriate level of service for the area. The facility received a new roof in 2008, after the old roof collapsed under record snowfall in January of that year.

Some rural area customers may be affected by changes to the urban transfer system, primarily self-haulers who currently use the Houghton or Renton transfer stations. When a new urban facility is ultimately sited in the Northeast service area, the facility location may or may not adequately meet the service needs of rural areas. Should it be necessary, the division may consider siting drop box facilities to serve residents. Construction of regional transfer stations in these rural areas is not being considered. The division recommends deferring decisions about whether to site drop boxes in these potentially underserved areas and whether to close the Renton transfer station until after the new urban transfer stations have been completed and the impact on service capacity has been fully evaluated.

City Mitigation

Transfer stations provide an essential and beneficial public service. However, the stations have the potential to cause undesirable impacts on host cities and neighboring communities, such as increased litter, odor, noise, road/curb damage, and traffic, as well as aesthetic impacts. The division works to mitigate these impacts in a number of ways, such as collecting litter, landscaping on and around the site, limiting waste kept on-site overnight to reduce the potential for odor, making road modifications, and siting facilities on or near major roadways to keep traffic off local streets.

Seven cities in the division's service area currently have county-owned transfer facilities within their boundaries:

- **Algona** – the Algona Transfer Station,
- **Bellevue** – the Factoria Recycling and Transfer Station,
- **Enumclaw** – the Enumclaw Recycling and Transfer Station,
- **Kirkland** – the Houghton Transfer Station,
- **Renton** – the Renton Transfer Station,
- **Shoreline** – the Shoreline Recycling and Transfer Station, and
- **Tukwila** – the Bow Lake Recycling and Transfer Station.

As new transfer stations are constructed in the near future, the division will work with host and neighboring cities to build stations that are compatible with the surrounding community. For example, during the design of the Shoreline Recycling and Transfer Station, the division worked closely with the community to identify impacts and mitigation measures. One result is that transfer trailers drive directly from the station onto Interstate 5 using King County Metro Transit's dedicated freeway ramps rather than city streets for access. In addition, sidewalks on nearby streets were improved; a new walking path was constructed at nearby Ronald Bog Park; trees were planted; and the portion of Thornton Creek that flows through the site underwent significant restoration. The transfer building was also moved farther from residences and is fully enclosed to mitigate impacts from noise, odor, and dust.

The division has also worked closely with the City of Bellevue on the replacement of the Factoria Transfer Station. The initial plan was for a new facility to be constructed on property that fronts Interstate 90 adjacent to the south side of the old station. However, as a result of discussions with Bellevue, the division purchased adjacent property to the northwest of the old station to complete the new facility.

The Amended and Restated ILA (included in its entirety in Appendix C) identifies the roles and responsibilities of the county and the cities in the regional solid waste system. The county agrees to collaborate with host and neighboring cities on both environmental review and project permitting. Additionally, the Amended and Restated ILA

recognizes that, in accordance with RCW 36.58.080, a city is authorized to charge counties to mitigate impacts directly attributable to a county-owned solid waste facility. It must be established that such charges are reasonably necessary to lessen or eliminate impacts and the revenue generated may only be used for impact-mitigation purposes. Direct impacts may include wear and tear on infrastructure, including roads. The city and county will work cooperatively to determine the extent of the impacts and appropriate mitigation payments and will document any agreement. Mitigation, including any necessary analysis, is a cost of the solid waste system and as such would need to be included in the solid waste rate.

Transfer Services after an Emergency

Relatively common emergencies, such as seasonal flooding and winter storms, as well as major events, such as earthquakes, can create a significant amount of debris. Debris generated during these types of events can obstruct roadways, cause power outages, and interrupt essential services. A coordinated and effective plan ensures that debris is properly managed to lessen the impacts on communities, the economy, and the environment in the immediate aftermath of an emergency without causing additional problems later in recovery.

To this end, the division prepared the *King County Operational Disaster Debris Management Plan* (Debris Management Plan)(KCSWD 2009) for unincorporated King County. The Debris Management Plan is intended to facilitate rapid response and recovery efforts during a disaster. The Debris Management Plan will be reviewed periodically, prior to the storm season, and updated as needed.

The Debris Management Plan supports the 37 incorporated cities that are part of the King County solid waste system with a framework and recommendations that can be used by the cities to develop their own operational disaster debris management plans. The cities have the flexibility to develop a debris management plan that best addresses their individual needs without compromising continuity within the county. Several cities have now adopted individual plans. The City of Seattle has its own debris management plan and the City of Milton is participating in Pierce County's debris management program.

The county's Debris Management Plan stipulates that during emergency response and recovery, the roles within the King County solid waste system do not change. This means that the division will continue to accept municipal solid waste at the transfer stations to the extent possible and will maximize recycling in accordance with RCW 70.95.010 (8) and KCC Title 10. The transfer facilities will not be used for disposal of disaster debris that could be recycled.

The debris created by a larger event, such as an earthquake, would likely consist primarily of recyclable materials, such as concrete, metal, and wood. The division's Debris Management Plan is coordinated with emergency plans prepared by other jurisdictions to maximize the recycling of these materials. The division works with the King County Regional Communications and Emergency Coordination Center (RCECC) and the Local Hazardous Waste Management Program to coordinate public information and help cities and residents identify recycling options in the event of a debris-causing emergency. Recycling the majority of emergency debris will maximize the division's capacity to continue to handle municipal solid waste over the short- and long-term.

In the event of an emergency, transfer services may be suspended in the short-term. The division's priorities are to:

1. Ensure the safety of staff and customers,
2. Confirm the structural integrity of facilities and environmental control systems,
3. Coordinate with the RCECC to determine any immediate needs for division staff or equipment, and
4. Resume service.

The division will maximize the use of existing transfer facilities after an emergency through operational measures such as increased staffing or hours. If some transfer facilities are closed or damaged as a result of the event, customers will be rerouted to remaining stations, and commercial haulers may be routed directly to Cedar Hills landfill Additionally, the division and the cities may establish temporary debris management sites where debris can be stored until it can be sorted for recycling or proper disposal. It is recommended that potential sites in unincorporated King County and in cities be identified by each jurisdiction in advance of an emergency. The acceptance policies at these sites would be determined in response to the nature of the event and the debris that is generated.

Processing Collected Materials

Processing Commingled Recyclables

The division expects that the private sector will continue to expand processing capacity for commingled recyclables as the need arises. In addition, numerous other private-sector facilities have emerged across the county where individual residents and businesses can bring source-separated recyclables, from paper, cans, and bottles to printer cartridges and cellular telephones, for processing.

While the conversion to commingled collection makes recycling easier for consumers and has resulted in increased recycling, it presents some challenges for the recovery and processing facilities. One of the challenges is cross-contamination of materials as they are sorted and separated. This is a problem particularly for the paper stream, where materials such as plastic milk jugs end up in the baled paper. Plastic bags sometimes catch in and jam the sorting machinery at materials recovery facilities, and they can blow around and cause litter problems. Paper mills overseas typically perform additional sorting of the materials to recover misplaced recyclables; however, most domestic paper mills dispose of these materials. In the case of glass, even small amounts of contamination in the sorted material can reduce the quality and affect the potential end use of the recycled glass. These problems illustrate a fundamental conflict between the benefits of commingled recycling (it makes collection easier and leads to increased recycling) and the need for the materials recovery facilities and end users to minimize the costs of handling these materials.

Sorting line at the Cascade Recycling Center (Photo courtesy of Waste Management)

For the processing of commingled recyclables to be most efficient, it is important that consumers are careful about preventing contamination in the recycled loads by: 1) preparing recyclables for the collection cart (i.e., rinsing out bottles and jars, breaking down cardboard boxes) and 2) placing materials in the proper collection container 3) closing container lids to keep materials dry. Contamination in the recyclables can cause a wide array of problems during processing, which can lead to a reduction in the value of the materials processed for market or, in extreme

cases, the disposal of entire mixed loads. This issue can best be remedied through education programs on proper recycling techniques offered through local governments and the collection companies. See Chapter 4 for a discussion of issues regarding markets.

As the region moves forward, the recommended role of the county and cities is to focus on increasing the supply and improving the quality of recyclable materials delivered to processors. The value of materials for recycling can be maximized through public education – to decrease contamination in the recycling stream and ensure that materials are properly prepared before being placed in the recycling container – and through market development – by encouraging businesses to invest in technologies used to sort and process recyclables.

There are materials that present unique challenges or require more definitive decisions about the optimal way to process them, such as container glass, food-contaminated paper, compostable and degradable plastic, plastic bag and film, plastic caps, poly-coated paper, and shredded paper. The division, along with several cities, has participated in the Northwest Region Commingled Workgroup to identify key issues with commingled collection and processing and to develop recommendations for addressing them. The division will be working with the cities, the collection companies, and processors to determine which of these recommendations will be implemented in King County.

Processing Organics

Organic waste (yard, wood and food waste) represents the largest recyclable commodity that is landfilled – 320,000 tons, more than a third of the total tons disposed at Cedar Hills landfill. Diverting these materials is key to meeting our goals. Currently composting is the primary processing option for these materials in the region.

The volume of organics that is currently collected from King County businesses and residents for recycling is close to exceeding the regional permitted capacity for such processing. The current amount of recycled organics represents 90 percent of the region's processing capacity.

Table 5-5. Regional compost facilities

2017 Summary of organics recycled by region				
Jurisdiction	King County	City of Seattle	Snohomish County	***TOTAL***
Tons Per Year	257,829	177,315	65,800	***500,944***
2018 Summary of organics permitted capacity by processor				
Processor	Cedar Grove: Maple Valley	Cedar Grove: Everett	Lenz: Stanwood	***TOTAL***
Address	17825 Cedar Grove Rd SE, Maple Valley, WA	3260 36th Pl NE Everett, WA	5210 SR 532 Stanwood, WA	
Tons Per Year	250,000	228,000	75,000	***553,000***

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There is only one facility in King County permitted to handle food waste. Relying on one large regional facility that is operating near its maximum permitted capacity is a concern, especially if the region wants to increase the amount of organics that are recycled instead of being disposed. This facility is pursuing operational changes to help mitigate odor concerns, and continues to be the subject of community odor complaints. One reason that capacity is constrained in the region is because organics cannot be transported to Central/Eastern Washington for new processing capacity because of the Washington State Apple Maggot Quarantine regulations (RCW 17.24).

Maintaining the quality of finished product is critical to compost markets, and processing challenges include:

Cedar Grove Composting Facility (Photo courtesy of Cedar Grove)

- Contamination of composting feedstocks, particularly from glass and plastic film.
- Composting feedstocks are in transition. Regional commercial facilities were largely designed for yard waste, not the mix of food, yard, and compostable packaging that is collected and processed today. A need exists for upgraded technology to manage the new material mix.
- Processors have expressed a desire to better anticipate the future feedstock mix, noting a need for better information on volumes and incoming materials to inform investments in capacity, equipment, and labor.
- Financing for technology upgrades at existing facilities.
- Composters report that market prices and sales for compost products have been stable. However, maintaining the quality of finished product is key to maintaining adequate market demand for compost; processors must balance the costs of adding processing steps (such as for additional contaminant removal) with maintaining competitive market prices for finished product.

If organics diversion significantly increases in King County and the surrounding region, more processing capacity will be needed. In order to significantly increase diversion of organic materials that are disposed from single and multi-family homes and businesses, a regional dialogue with exploration of alternatives and solutions for expanding capacity is necessary. This will help minimize environmental and community impacts related to regional organics processing and ensure an adequate capacity and infrastructure is in place for regional organics processing, including contingency plans in the event regional capacity is constrained.

A range of options should be pursued to address organics recycling capacity including continued organics and soils education to promote the recycling and use of organics on landscapes, market development such as local buy-back programs, the pursuit of new technologies and additional private or public infrastructure development.

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Emerging Processing Technologies

Resource recovery goes beyond sorting to include technologies such as anaerobic digestion, advanced materials recovery, pyrolysis, and gasification. Most of these technologies hold promise for the future but do not yet have extensive track records in reliably handling the amount of waste in King County's system. A brief discussion of anaerobic digestion and advanced materials recovery follows. For a discussion on pyrolysis and gasification, see Chapter 6, *Landfill Management and Solid Waste Disposal.*

Anaerobic Digestion

In 2016, the division hired HDR Engineering to evaluate options for adding anaerobic digestion to regional organics processing (KCSWD 2017b). Anaerobic digestion is a biological process that transforms organic waste into renewable energy, and in some situations, a useable residual by-product. HDR evaluated anaerobic digestion technologies using both source-separated organics with minimal contamination, and municipal solid waste containing approximately one third organic waste. The division required HDR to focus on local conditions, feedstocks, and markets.

While the study does not identify a clear role for anaerobic digestion in the county's solid waste system, it does recommend further research into several small-scale anaerobic digestion options for source-separated organics, with varying levels of public and private sector collaboration. For instance, with grant money from the division, a small-scale anaerobic digester is being piloted on Vashon Island. Source-separated organics-based anaerobic digestion solutions are currently more affordable and more reliable than municipal solid waste-based systems. As a feedstock, municipal solid waste typically benefits greatly from advanced pre-processing, which is costly and currently has mixed success rates.

Example of a small anaerobic digester in Redmond
(Photo courtesy of Impact BioEnergy, Inc.)

Currently, source-separated organics in King County are managed by private-sector companies, and do not even come to the county's transfer stations. However, source-separated organics are likely the best feedstock for successful anaerobic digestion based on minimal contamination which lowers pre-processing costs, eases the anaerobic digestion process, and results in a marketable organic by-product.

Advanced Materials Recovery

Advanced materials recovery as it is envisioned at the county recycling and transfer stations would involve both floor sorting of recyclables by division staff and installing some mechanical sorting systems at select facilities (most likely Bow Lake, the new south station, and any other new stations). An additional consideration might be a separate advanced materials recovery facility (public, private, or a partnership) capable of processing sufficient mixed waste to reach a 70 percent recycling rate for the county. This alternative would reach recycling goals more quickly than waste prevention would, as it relies less on changes in customer behavior. However, feasible system configurations and cost effectiveness are not yet known and would require more study, including a cost benefit analysis.

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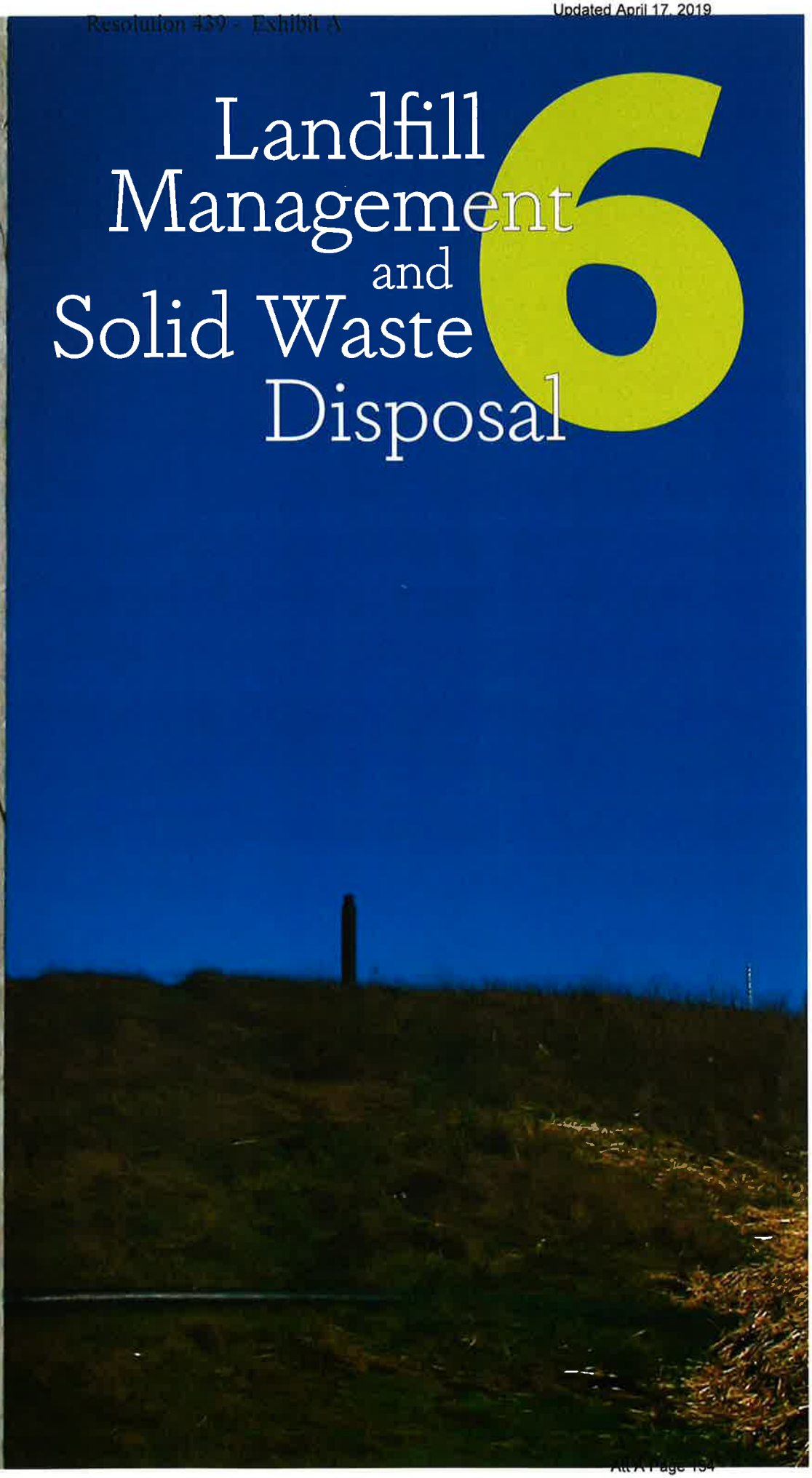
6 Landfill Management and Solid Waste Disposal



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Policies

D-1 Operate and maintain the Cedar Hills Regional Landfill to meet or exceed the highest federal, state, and local standards for protection of public health and the environment.

D-2 Maximize the capacity and lifespan of the Cedar Hills Regional Landfill.

D-3 Monitor and maintain closed landfills to meet or exceed the highest federal, state, and local standards for protection of public health and the environment.

D-4 Plan for future disposal when Cedar Hills Regional Landfill closes to ensure no gap in service. Siting a replacement landfill located in King County will not be considered.

D-5 Garbage shall not be disposed of, nor shall soils be stockpiled, within 1,000 feet of the property line at the landfill, in accordance with the Settlement Agreement. The solid waste division shall reserve sufficient funds to acquire any parcels from willing sellers as necessary to establish or maintain the buffer.

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Summary of Recommended Actions

The following table includes a menu of recommended actions that the county and the cities should implement. Under the responsibility column, the entity listed first has primary responsibility for the action, bold indicates that the entity has responsibility for the action, and a star (*) indicates that the action is a priority. If the responsibility is not in bold, the action has lower implementation priority.

Action Number and Responsibility	Action	Detailed Discussion
1-d County, cities, advisory committees*	Further develop the Cedar Hills regional landfill to maximize disposal capacity. To account for technological advances, do not specify the next disposal method after ultimate Cedar Hills closure in this Plan. Conduct analysis of post Cedar Hills disposal options prior to the next Plan update to ensure adequate lead time for selecting, planning for, and implementing the next disposal method.	Page 6-5
2-d County*	Continue to track, evaluate, and test other disposal and conversion technologies for their potential to handle all or a portion of the county's future waste. Provide updates on findings to division advisory committees on a regular basis.	Page 6-9
3-d County, cities, tribal governments, advisory committees	To prepare for potential emergencies, work with state and regional authorities to coordinate an updated Debris Management Plan for King County.	Page 6-14
4-d County	Investigate beneficial reuse options for closed landfills, designing monitoring and environmental systems that will facilitate reuse of the properties, provide potential revenue, and provide continued benefit to the surrounding communities.	Page 6-17
5-d County	Implement a bird management plan for Cedar Hills Regional Landfill	Page 6-8

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Landfill Management and Solid Waste Disposal

This chapter discusses the County's current disposal practices at the Cedar Hills landfill, as well as presenting important long-term disposal choices that must be decided as part of the approval of this Plan. It also provides information on how special wastes are disposed, disposal of waste after an emergency is handled, and programs to address disposal of illegally dumped waste are operated. Finally, it addresses how past disposal sites – closed landfills – are managed.

Current Disposal at the Cedar Hills Landfill

For more than 50 years, King County has relied on the Cedar Hills landfill as a local means of cost-effective solid waste disposal. Although another disposal method will ultimately be needed, the county has used several approaches to maximize value for ratepayers and extend the landfill's life beyond the 2012 closure date predicted in the 2001 *Comprehensive Solid Waste Management Plan*. Since 2001, new practices and policies have made better use of landfill space, new capacity has been built, the tons going to the landfill have been reduced, and studies have identified opportunities to further develop Cedar Hills to maximize disposal capacity through the planning horizon of this Plan. The *Solid Waste Transfer and Waste Management Plan* (Transfer Plan), approved by the County Council in December 2007, included the following recommendation:

> "Explore opportunities for taking advantage of available landfill capacity to extend the life of this cost-effective disposal option; revise the Cedar Hills Site Development Plan and seek to maximize the capacity (lifespan) of the landfill, subject to environmental constraints, relative costs to operate, and stakeholder interests."

To implement the Transfer Plan recommendation, the division is pursuing three primary strategies to extend landfill life:

- Diversion of waste,
- Operational efficiencies, and
- New area development.

These three strategies seek to extend the life of the landfill by increasing landfill capacity and density, which are defined as follows:

- **Landfill capacity** –the amount of space, often referred to as airspace, which is permitted and available for disposal of waste. Landfill capacity is calculated based on the height, footprint, and slopes of the landfill.
- **Density** – how tightly materials are packed together, in this case solid waste in the landfill. A higher density means more waste packed into a given amount of space. The density of solid waste within the landfill is a function of both operational practices, the types of waste, and natural processes. Density is increased as waste is compacted by heavy machinery on the face of the landfill and by the natural settling that occurs over time as solid waste decomposes.

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Diversion of Waste

Reducing the amount of waste delivered to the landfill (waste diversion) is the most effective strategy for extending landfill life. The division will continue to practice current methods of waste diversion and may implement further strategies, as discussed below and in more detail in Chapter 4, *Sustainable Materials Management*.

Current Strategies for Waste Diversion

Waste is currently diverted from Cedar Hills through two primary methods – waste prevention and recycling and a ban on the acceptance of most construction and demolition debris.

Waste prevention and recycling efforts have proven a successful strategy for extending the life of the landfill. During a 20-year period, an estimated 10 million tons of materials that would otherwise have been disposed in the landfill were recycled, extending the landfill's life by approximately 10 years.

Banning most construction and demolition debris from Cedar Hills has also contributed to extending landfill life. Since the disposal ban went into effect in 1994, an estimated 4 million tons of construction and demolition debris has been diverted from the landfill (see Chapter 4, *Sustainable Materials Management* for more information about construction and demolition debris recycling and disposal).

Potential Strategies for Waste Diversion

The division will continue to consider diverting a portion of the solid waste stream to another recycling, recovery, or disposal option(s) while the landfill is still in operation. However, a cost-benefit analysis, including a comparative analysis of greenhouse gas emissions, would precede any decision to pursue early diversion because the cost of adding a new disposal method to the cost of operating Cedar Hills may outweigh the benefits of extending landfill life. Possible diversion options include waste conversion technologies such as anaerobic digestion, demonstration projects of other evolving technologies that promote resource recovery, or exporting some waste to an out-of-county landfill. Environmental, social, economic, and other criteria also would play into any waste diversion decision.

Operational Efficiencies

The division has made a series of operational changes to increase landfill capacity and density. These changes include reducing the amount of soil and rock buried in the landfill, using more efficient unloading and compaction equipment, and taking advantage of natural settlement. Some of the key changes and efficiencies achieved are described below:

- The division has implemented strategies to minimize the placement of soil in the landfill. For example, in the past, six inches of compacted soil was used to cover the entire surface of the active solid waste disposal area at the end of each working day. Daily cover serves to control litter and discourage foraging by animals, such as rodents and birds. However, the use of soil consumes valuable landfill space. The division now uses retractable tarps to cover most of the waste at the end of each day to reduce the amount of soil buried in the landfill. The tarps serve the same function as daily soil cover. At the start of each day's operations, the tarps are rolled up, and more solid waste is placed directly on top of the previous day's waste. Soil is still used to cover side slope areas. However, as much of this soil as possible is removed before more waste is placed, and the soil is then reused. Together, these practices have resulted in a reduction of the volume of soil buried in the landfill.

- Tippers now empty trailers and containers rather than the walking floor trailers previously used. Walking floor trailers require a large, rock covered surface for the trucks to drive on as the walking floor rolls the garbage out the back of the trailer. These large rock surfaces are not required with the tippers. Instead, the garbage trailers are backed onto the tipper, which tilts the trailer, allowing the garbage to slide out of the back and into the refuse area. The use of tippers not only reduces the use of rock, it also decreases unloading time for each trailer by at least half, and reduces damage to equipment and tires.

Tippers empty trailers more efficiently

- Heavier equipment and improved methods have increased waste compaction. Packing the waste to a greater density allows more airspace for additional solid waste in each landfill area.
- Another strategy for increasing landfill capacity is taking advantage of the natural settlement that occurs as waste placed in each area decomposes. As this natural settling occurs, the level of the landfill drops below the permitted height, allowing more waste to be added to bring the height of a previously filled area back up to its planned level. To take advantage of this natural settlement, the division has delayed final closure of Areas 5 and 6, and will delay final closure of Area 7, to allow settling to occur so that additional waste can be added before final cover is applied.

With these operational changes, more solid waste can be placed within the already designed and permitted refuse areas. The division will continue to pursue these and other best management practices that preserve airspace and make more efficient use of landfill capacity. The division will also work with subject matter experts to determine best practices related to use of top lifts and temporary covers, including how long temporary covers should be used prior to applying final cover. The division will provide a report on the best practices with implementing actions to the King County Council no later than April 1, 2020.

New Area Development

During 2009 and 2010, the division explored alternatives for developing new refuse areas to extend the landfill life. A wide range of alternatives was originally identified. Based on a preliminary assessment of operational and engineering feasibility, as well as likely environmental impacts, five action alternatives were developed that would extend landfill life for an additional three to 13 years beyond the then projected closure date. The environmental impacts of these alternatives were evaluated in an environmental impact statement (EIS), with the Final EIS issued in July 2010. The EIS determined that none of the five action alternatives would result in any significant unavoidable adverse environmental impacts compared with the no action alternative (KCSWD 2010a).

The preferred alternative from the Final EIS develops 56.5 acres for a new Area 8 in the southwestern portion of the landfill and extends landfill life for eight to nine years. It maximizes the use of readily available space at the landfill, with the least amount of disruption to existing landfill structures. Garbage shall not be disposed of, nor soils be stockpiled, within 1,000 feet of the property line at the landfill, in accordance with the Settlement Agreement. At the same time, this alternative preserves the flexibility to implement further development should it be necessary in the future and balances the cost of future development and operations with savings to the ratepayer.

Developing a new area requires extensive excavation and preparation

In 2000 King County entered into a Settlement Agreement in the following consolidated class action cases: *Anderson et al v. Cedar Grove Composting Inc, et al* (King County Superior Court Case No. 97-2-22820-4 SEA and *Rick I. and Kim M. Brighton, et al v. Cedar Grove Composting et al* (King County Superior Court Case No. 97-2-21660-5 SEA (hereinafter referred to as the "Settlement Agreement").

Following publication of the Final EIS, the division submitted a Project Program Plan for implementing the preferred alternative to the County Council for approval (KCSWD 2010b). The County Council approved the Project Program Plan in December 2010.

Permitted Capacity Planned for Cedar Hills through 2028

Cedar Hills has built capacity remaining in four areas (Areas 5, 6, 7, and 8). The estimated capacities are based on the difference between existing landfill contours (September 2, 2017 aerial survey) and the approved design contours at completion.

As the landfill ages, it settles. Airspace from settlement can be recovered for disposal. Settlement occurs due to consolidation and to loss of mass from leachate and more importantly, gas production. As gas is collected, it is removed from the landfill. The airspace gas once occupied consolidates and the landfill settles. Soil surcharge can be used to accelerate settlement. Areas 5 and 6 both have areas of soil stockpiled over them to accelerate settlement. This soil will be recovered later for other uses. Cedar Hills landfill has additional planned capacity in Area 8. Area 8 is currently under construction, which began in 2017 and will be ready for use in 2018. In addition to Area 8, a top lift over Areas 7 and 8 is planned to bring those areas to a permitted maximum design elevation of 800 feet. Such activity would be done only to the extent that such activity would be consistent with the terms and conditions of the Settlement Agreement, which requires King County to make a good faith effort to keep the maximum height of areas 5, 6, and 7 of the Landfill at or below 788 feet above sea level.

The table below presents current and planned capacity in cubic yards and tons by area, as of September 2, 2017. It is based on an air space utilization of 1,600 pounds of refuse disposed per cubic yard of air space consumed, and an average yearly 1,025,000 tons (forecasted between 2017 and 2028). 1,600 pounds per cubic yard is the airspace utilization achieved in Area 7 using current operational practices (compaction, daily cover usage, and rock recovery). The terms and conditions of the Settlement Agreement may impact the actual utilization of the Area Capacity described in the table.

Area Capacity	Estimated Cubic Yards	Estimated Tons	Estimated Number of Years
5 Top Lift	1,923,000	1,538,400	1.4
6 Top Lift	1,367,000	1,093,600	1
7	2,070,000	1,656,000	1.5
8	7,842,000	6,273,600	5.7
7 & 8 Top Lift	1,061,000	848,800	0.8
Total	14,263,000	11,410,400	10.4

The Next Disposal Option

A Disposal Option Must Be Selected as Part of This Plan's Approval

With permitted capacity (Area 8) at the landfill predicted to be used by 2028, the disposal option for beyond 2028 must be selected. The selection is needed to provide substantial lead time to complete financial, operational, and infrastructure preparations, including completion of environmental review under the State Environmental Policy Act (SEPA). Interlocal agreements also require the county to consult with partner cities at least seven years before Cedar Hills closes, triggering a consultation in 2021 if no new Cedar Hills capacity is built. For these reasons, selecting a disposal option as part of approval of this Plan is essential to ensure there is no gap in the division's ability to dispose of waste and meet contractual obligations.

Further Development of Cedar Hills is Recommended

For the Public Review Draft Plan issued in January 2018, the division used information from the *Conversion Technology Report* (R.W. Beck 2007), the *Waste-to-Energy Study* (Normandeau 2017), and an updated *Cedar Hills Site Development Alternatives Final Report* (KCSWD 2017a) to identify three options to meet the county's disposal needs after currently permitted capacity at Cedar Hills is used: 1) Further develop Cedar Hills, 2) waste export, and 3) waste to energy (mass burn) facility. After public comment and careful consideration of the three disposal options, the option to further develop the Cedar Hills Landfill is recommended.

This recommendation will further develop Cedar Hills to maximize disposal capacity, extending the division's over 50-year practice of managing its waste locally. The increased capacity shall not all result in either disposal of garbage or stockpiling of soils within 1,000 feet of the property line at the landfill, in accordance with the Settlement Agreement, but will develop new cells within the existing footprint of the landfill and increase the height from the permitted 800 feet up to 830 feet, only to the extent that such activity would be consistent with the terms and conditions of the Settlement Agreement, which requires King County to make a good faith effort to keep the maximum height of areas 5, 6, and 7 of the Landfill at or below 788 feet above sea level. Based on the 2018 tonnage forecast, maximizing the development of the landfill should extend capacity through the planning horizon of this Plan. Landfill life could be extended if recycling increases, recessions occur, or more complex development approaches are used. To account for emerging technologies, the next disposal option after Cedar Hills is not specified in this Plan, but would be evaluated in collaboration with regional partners prior to the next Plan update to ensure no gap in service. The recommended further development is consistent with county policy to maximize the life of the Cedar Hills landfill. *The Conversion Technology Report* (R.W. Beck 2007) and more recent division analysis concluded that Cedar Hills disposal is the most economical way to handle King County's waste. Other advantages include the division's experience in landfill operation, availability of space in a county-owned landfill with state of the art environmental controls, and collection of landfill gas to produce renewable energy.

Developing Cedar Hills to the maximum extent feasible has the lowest rate impact of the three options considered, the lowest greenhouse gas emissions and the lowest risk because of long-term experience in its operation. Other benefits include that waste created in King County will continue to be managed locally, the division will maintain control over the system, and landfill gas will continue to be delivered to the Bio-Energy Washington facility, resulting in pipeline-quality natural gas, revenue for the division, and reduced greenhouse gas emissions. Table 6-1 includes a comparison of key attributes of the three options.

To reduce impacts on neighboring communities, King County shall implement a bird management plan.

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Table 6-1. Comparison of key disposal option characteristics (planning level estimates)

Comparative Attribute	Further Develop Cedar Hills	Waste Export To An Out-of-County Landfill	Waste To Energy Facility
Cost per Ton[1]	$41	$55	$136
Life Cycle Greenhouse Gas Emissions (EPA's WARM Model)	(134,000)[2] MTCO2e	(78,000)[2] MTCO2e	12,000 to 80,000[3] MTCO2e
Annual Greenhouse Gas Emissions (EPA's eGGRT)	91,000[4] MTCO2e/year	91,000[4] MTCO2e/year	1,200,000 MTCO2e/year
Recycling Rate	No change	No change	2% increase
Risks	SEPA, Permitting	Rail Capacity, Control	Siting, Sizing

1 Estimated cost per ton in 2029.

2 WARM model calculation for 2029. (King County SWD). For more information, see Appendix D.

3 WARM model calculation.(Normandeau 2017).

4 Landfill options show estimated emissions in 2029.

Models used by Regulatory Agencies to Calculate Greenhouse Gas Emissions

- The Waste Reduction Model (WARM) is a U.S. Environmental Protection Agency (EPA)-approved decision tool for estimating relative lifecycle greenhouse gas emissions associated with disposal options such as landfilling, composting, mass burn, or anaerobic digestion. WARM answers the question: Which of my next disposal options result in the lowest lifecycle greenhouse gas emissions, accounting for both emissions and offsets?

  WARM requires a profile of disposed materials, which was drawn from the division's 2015 Waste Characterization. WARM then assigns emissions to the materials and converts the emissions into metric tons of carbon dioxide equivalents (MTCO2e). Each material's emissions represent lifecycle emissions from mining to manufacturing to disposal. Because those emissions did not happen in a single year or place, WARM results cannot be directly ascribed to a particular year or facility site. WARM emissions are not precise – they represent the relative emissions of different choices (i.e. Option A has lower emissions than Option B). WARM results from this plan's landfill options show negative values largely due to offsets created by displacing fossil fuels with landfill-derived gas and sequestration of carbon due to burial of organics.

- The eGGRT model creates a greenhouse gas (GHG) inventory of emissions from a specific facility (such as a landfill or mass burn facility) in a given year. This model answers the question: What are the emissions from historically disposed materials at my landfill this year?

  eGGRT default values can over-ride site-specific data so that model results and facility monitoring data may not entirely agree. The division reports eGGRT-estimated Cedar Hills landfill emissions each year for the Washington Department of Ecology and EPA. Year-to year eGGRT emission changes from that specific facility can be tracked and compared with emissions from other facilities. The agencies also use the results to set priorities for developing facility emission-reduction programs.

Other Long-Term Disposal Options Considered

Waste export and a waste to energy (mass burn) facility (described below) were also considered as disposal options in the Public Review Draft Comp Plan. Those options are not recommended as the next disposal option after current permitted Cedar Hills capacity (Area 8) is used in 2028, but could be undertaken after an expanded Cedar Hills ultimately closes. This plan does not consider the option of developing a replacement landfill either in King County or in another county, in keeping with policy established in the 2001 Plan. Conditions in King County such as land availability, environmental considerations, public acceptance, cost, and other issues would impede any effort to site a replacement landfill in the county. In addition, there are existing landfills outside of King County with significant capacity available.

Waste Export

This option would export waste via rail to an out-of-county landfill after permitted capacity at Cedar Hills is used by 2028. Waste export by rail is a proven disposal option used by neighboring jurisdictions, including the City of Seattle and Snohomish County. There are several regional landfills available by rail with combined capacity sufficient to handle the county's waste in the long term (KCSWD 2017c). This option would transfer a significant portion of the County's waste management activities into the private sector for long haul and landfilling. This option is not recommended as the next disposal option after 2028 for several reasons. It has higher costs than further development of the Cedar Hills landfill. It requires modifying transfer stations for rail-ready transport, division operational changes, and requires sufficient lead time for contracting for services.

The Waste Export option would require all of the county's waste to be exported on trains. According to the Washington State Freight Rail Plan, it is unclear if the freight rail system will have adequate rail capacity by 2028 (Normandeau 2017) to accommodate all of the county's waste. In addition, according to the Washington State Department of Transportation 2014 "Landslide Mitigation Action Plan," rail service can be disrupted by landslides and flooding. If service interruptions stretch from days to weeks, unsanitary conditions could occur at transfer stations and eventually in the neighborhoods where collection services must be stopped. Scarce rail capacity and service disruptions could increase costs and require robust contingency planning.

Waste to Energy Facility

Under this option, all of the region's municipal solid waste would be directed to a waste to energy facility built in King County when current permitted capacity at Cedar Hills is reached by 2028. As discussed previously, a recent study identified a mass burn facility as the best waste to energy technology for consideration by King County (Normandeau 2017). Mass burn facilities operate successfully in many parts of the U.S. and the world.

To handle the county's projected tonnage, the facility would require approximately a 40 acre site and be designed to handle 5,000 tons-per-day so that it could operate 20 years before further disposal capacity is needed. After 20 years, an added/expanded waste to energy facility or other disposal method would be required. A waste to energy facility would reduce waste to ash 90 percent by volume and 75 percent by weight, while offsetting some costs through the sale of electricity and increasing recycling by as much as two percent by recovering metals after the waste is burned. Non-processable, bypass waste, and ash would be transported to an out-of-county landfill by rail. This option is not recommended as the next disposal option after 2028 for several reasons. It has the highest cost of the options considered, it requires guaranteed amounts of consistent feedstock, has potential for inefficient operation in early years when less capacity is used, and it has the highest greenhouse gas emissions of the options considered. As with waste export, rail capacity constraints could disrupt export of ash and bypass waste. At 5,000 tons per day, the facility would be among the largest in the world with associated implementation and siting risks.

Next Steps

Several actions will need to be taken in order to further develop the Cedar Hills Landfill beyond its current permitted capacity. The following steps are needed at Cedar Hills to maximize disposal capacity:

- Move facilities currently located at the landfi ll that are on areas permitted for refuse disposal.
- Revise the Project Program Plan (KCSWD 2010b) and Cedar Hills Site Development Alternatives Final Report (KCSWD 2017a) for the development of Cedar Hills and conduct a new SEPA environmental review, since increasing the height of the landfi ll up to 830 feet was not considered in the 2010 EIS (KCSWD 2010a).
- Apply to Public Health – Seattle and King County for a permit modifi cation to allow the landfi ll to be expanded up to 830 feet in height only to the extent that such modification would be consistent with the terms and conditions of the Settlement Agreement, which requires King County to make a good faith effort to keep the maximum height of areas 5, 6, and 7 of the Landfill at or below 788 feet above sea level.
- Develop new landfi ll cells.
- While Cedar Hills expansion is underway, the region will need to review the latest technological advances and take those into account during the next Plan update to properly evaluate disposal options for the ultimate closure of Cedar Hills.

Given the longer life of the facility, King County will develop and implement a bird management plan for the Cedar Hills Regional Landfill. The bird management plan shall include at least the following elements:

- An inventory of birds at least seagull-sized or larger that inhabit the Cedar Hills Regional Landfill, including species and number of birds, to be updated annually;
- Design suggestions to minimize attractiveness of the site to birds;
- A description of proposed bird control methods including equipment, construction activities, permits required (including federal and state fish and wildlife permits), and other operation and maintenance requirements related to bird control;
- Description of staff resources and training needed to implement the control plan thoroughly and completely;
- Performance metrics related to bird management; and
- A monitoring plan to, on at least an annual basis, assess the efficacy of the bird management plan and allow further adaptation and improvement of the plan. It will also provide a basis for determining if bird use of the area changes through time.

In recognition of the longer life of the landfill and to ensure transparency of landfill operations, the solid waste division shall transmit to the council each year the annual report submitted to the local health jurisdiction and the department of ecology, as required by WAC 173-351-200 (11), as amended.

Even with further development, Cedar Hills landfill capacity will ultimately be exhausted and a new disposal option will be needed. The next disposal option is not specified in this plan so that the latest technological advances can be considered when the choice is made. The Transfer Plan suggested that one disposal option - waste export - is best evaluated within 5 years of initiating service to ensure decisions consider current market conditions. Other disposal options such as waste to energy likely require a longer lead time. Although the Amended and Restated Interlocal Agreement requires consultation with cities at least seven years before Cedar Hills closes, evaluation of the next disposal option should begin prior to the next Plan update to ensure enough time for method selection, planning, and implementation.

Factors in Selecting a Long-Term Disposal Method

In cooperation with advisory committees, the division identified several criteria be used in selecting a long-term disposal option (see below). It is particularly important that disposal options are consistent with the commitment of the County and its partner cities to Zero Waste of Resources by 2030. Any long-term disposal option also must be responsive to increases in population, housing, and solid waste tonnage, as well as the specific composition of King County's waste. The 2018 tonnage forecast projects solid waste tons increasing to 1,275,000 tons by 2028 and continuing to grow, reaching 1,564,000 tons in 2040. This forecast assumes that the region's recycling rate remains at 52 percent.

King County's Office of Performance, Strategy and Budget will engage with the Solid Waste Division and the regional partners to develop a plan for long-term disposal, to be recommended to the King County Executive, who will transmit legislation to the King County Council implementing the next long-term disposal method. The Executive will transmit a progress report that outlines how this plan will be developed, including timing for development and transmittal of this plan, to the Council by December 31, 2021.

Screening and Evaluation Criteria for Disposal Options

The division, in collaboration with its advisory committees, has developed criteria by which disposal options may be screened and evaluated when making future decisions. The screening and evaluation criteria fall into six categories, each with a number of sub-categories on the following page:

- **Environmental**
  Human health
  Climate change
  Air quality
  Water quality
  Energy production
  Resource conservation
  Compatibility with waste prevention and recycling
- **Availability**
  Capacity
  Start date
  Operating life of facility
  Siting, design, permitting, and construction requirements
  Operating and maintenance personnel
  Financial assurance and insurability
- **Economic**
  Capital cost
  Financing
  Operating cost
  Revenue generated
  Risk
- **Social**
  Environmental justice
  Social justice/equity
  Effects on livability and character of communities
- **Operating history**
  Proven performance
  Ability to handle amount of waste
  Operator record
  Safety record
  Environmental compliance
  Compliance with regulatory requirements
  Ability to respond after an emergency
  Ability to provide performance guarantees
- **Contract and operational requirements**
  Minimum level of waste required
  Composition of waste required
  Contract flexibility
  Length of commitment required
  Opportunity for contract reopeners
  Waste not accepted/ability to handle special waste
  Residue disposal requirements
  Compatibility with waste prevention and recycling
  Compatibility with current collection and transfer systems

Technologies for the Future

A number of other thermal, biological, and chemical technologies, some established and some emerging, could handle all or specific components of the county's waste stream in the future (RW Beck 2007, KCSWD 2014a, and Normandeau 2017).

Hundreds of companies are forming, developing new methods, obtaining patents, and improving waste conversion technology systems. Many universities, consultants, and organizations are conducting studies and producing

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Terms

Waste conversion technologies are non-incineration technologies that use thermal, chemical, or biological processes, sometimes combined with mechanical processes, to convert the unrecycled portion of the municipal solid waste stream to electricity, fuels, and/or chemicals that can be used by industry.

Incineration is a disposal method that converts waste materials into ash, flue gas, and heat using controlled flame combustion.

Waste-to-energy technologies recover energy from municipal solid waste and include both waste conversion technologies and incineration with energy recovery, such as mass burn waste-to-energy, refuse-derived fuel, and advanced thermal recycling.

Systems are unique technological methods for processing specified feedstock that are developed and patented by companies.

Feedstock is the input material used by waste conversion and waste-to-energy technologies.

reports, and partnerships are forming to fund, build, and operate facilities. Meanwhile, jurisdictions are undertaking rule-making efforts to define terms and establish regulations that both facilitate the development of sustainable technologies and protect the environment and the public. Waste conversion technologies are also now being defined separately from incineration, e.g., "Waste conversion technologies are non-incineration technologies that are used to convert the non-recyclable portion of the municipal solid waste stream to electricity, fuels, and/or industrial chemical feedstocks" (SWANA 2011).

Waste conversion technologies use thermal, biological, or chemical processes that are sometimes combined with mechanical processes. Technologies using a thermal process include pyrolysis, gasification, and plasma arc gasification. Hydrolysis/fermentation, anaerobic digestion, and aerobic composting use biological processes. Depolymerization uses a chemical process.

The feedstock used by waste conversion technology systems can be municipal solid waste; selected materials removed from municipal solid waste, such as organics; or municipal solid waste combined with sewage sludge. Each system has unique requirements regarding the types, size, and amount of feedstock processed per day.

Below is a sampling of conversion technologies, as described by Jeremy K. O'Brien of the Solid Waste Association of North America (SWANA 2011). These technologies are not currently considered to have the capability to reliably and cost-effectively handle all the materials in the regional system.

> **Gasification** is a commercially proven manufacturing process that converts such hydrocarbons as coal, petroleum coke, biomass (such as wood and agricultural crops or wastes) and other organics to a synthesis gas (syngas), which can be further processed to produce chemicals, fertilizers, liquid fuels, hydrogen, and electricity. In a gasification facility, hydrocarbon feedstock is injected with air or oxygen and steam into a high-temperature, pressurized reactor until the chemical bonds of the feedstock are broken. The resulting reaction produces the syngas. The syngas is then cleansed to remove such impurities as sulfur, mercury, particulates, and trace minerals.

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Pyrolysis is a process that involves the thermal decomposition of feedstock at high temperatures (750°F–1,500°F) in the absence of air. The resulting end product is a mixture of solids (char), liquids (oxygenated oils), and gases (methane, carbon monoxide, and carbon dioxide). The oils and fuel gases can be used directly as boiler fuel or refined for higher-quality uses such as engine fuels, chemicals, adhesives, and other products. The solid residue contains most of the inorganic portion of the feedstock as well as large amounts of solid carbon or char.

Plasma arc gasification technology is a heating method that can be used in both pyrolysis and gasification systems. This technology was developed for the metals industry in the late nineteenth century. Plasma arc technology uses very high temperatures (7,000°F) to break down the feedstock into elemental by-products. When municipal solid waste is processed, the intense heat actually breaks up the molecular structure of the organic material to produce such simpler gaseous molecules as carbon monoxide, hydrogen, and carbon dioxide. The inorganic material is vitrified to form a glassy residue.

Anaerobic digestion is the bacterial breakdown of organics in the absence of oxygen. It can occur over a wide temperature range from 50°F to 160°F. Anaerobic digestion of municipal solid waste can occur naturally, as in a landfill, or in a controlled environment, such as a municipal solid waste anaerobic digestion facility. In the latter, municipal solid waste is first processed for removal of inorganic and recyclable components, reduced in size, and then placed in an airtight vessel called a digester, where the process occurs. Biogas is one of the by-products of anaerobic digestion facility and it can be used as fuel for engines, gas turbines, fuel cells, boilers, and industrial heaters. It can also be used in other processes and in the manufacture of chemicals. Anaerobic digestion would be a good option when the food waste is separated at its source from other wastes.

The division is committed to the continued exploration of these and other emerging technologies. In addition, the division is monitoring changing definitions, legislation and regulations, companies, and partnerships.

Disposal of Special Wastes

Most of the waste delivered to the division's facilities is municipal solid waste (garbage) from residential and non-residential sources. A portion of the waste stream, however, requires special handling and waste clearance before disposal because of legal, environmental, public health, or operational concerns. Of the approximately 800,000 to 1 million tons of solid waste disposed each year, between 6,000 and 9,000 tons is designated as special waste. These special items include industrial wastes; asbestos-containing materials; off-specification, recalled, or expired consumer products; over-sized materials; treatment plant grit and vactor wastes; and other miscellaneous materials. It does not include moderate risk wastes.

The division continues to educate customers on the county's waste acceptance policies through public outreach materials and hands-on customer service. Since 1993, the division has conducted a waste screening program to ensure that materials in the waste stream are handled in accordance with federal and state regulations (Resource Conservation and Recovery Act, Title 40, Subtitle D and WAC 173-351). Under this program, waste screening technicians, in cooperation with other staff, perform random manual and visual screening of incoming loads of waste at each transfer facility and at Cedar Hills to identify and properly manage any potentially unacceptable wastes. About 11,000 loads of waste are screened at division facilities each year. Waste screening, combined with ongoing surveillance and control of incoming solid waste by transfer station and landfill operations staff, is a significant step in the county's solid waste enforcement program. In cases where special waste policies are repeatedly disregarded, division staff enforces compliance through a progressive process of warnings, citations, and eventually fines for improper disposal of special wastes.

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Under the county's Waste Clearance Policy PUT 7-2-1(PR) and Waste Acceptance Rule PUT 7-1-6(PR), the Special Waste Unit provides a free service to customers to evaluate wastes and determine if they can be accepted for disposal and under what conditions. Special waste staff process and provide more than 400 waste clearances for disposal each year. Conditions for disposal could include wetting to control dust, bagging, hauling directly to the Cedar Hills landfill, specific packaging and labeling requirements, separation from other waste in a special waste disposal area, or certification of disposal by authorized landfill staff. Procedures for disposal of special waste are often defined by local, state, or federal regulation.

The method for handling special wastes once the Cedar Hills landfill closes will be considered during the evaluation of alternative disposal options.

Managing Illegal Dumping and Litter

Managing municipal solid waste that is dumped on open ground is one of the division's responsibilities. Illegal dumping and litter can cause environmental contamination and pose both safety hazards and risks to public health. Addressing the issue of illegal dumping requires several coordinated programs and the participation of many county departments, the cities, and other agencies. The division manages or participates in programs that strive not only to reduce littering and illegal dumping on public and private property, but also to assist its victims.

Illegal dumping

Illegal dumping is a continuing problem for agencies, businesses, and the general public who find yard waste, appliances, car bodies, and other wastes dumped on their personal property, on public property, and on road rights of way. The division continues to lead the implementation of recommendations made in 2004 by a county task force charged with strengthening and coordinating the county's response to illegal dumping complaints. In 2008, the County Council adopted an ordinance to refine the county's role in enforcing laws that prohibit illegal dumping on public and private lands.

The ordinance enhances the county's authority to cite and prosecute illegal dumpers. For example, it allows the county to charge a restitution fee to illegal dumpers and, in turn, provide monetary relief to victims of the illegal dumping. The fee can be waived if the illegal dumper cleans up and properly disposes of the waste.

Coordinating illegal dumping reporting and response through the Illegal Dumping Hotline (206-296-SITE) is a major element in the county's surveillance and control system for illegal dumping.

Regional responsibilities for illegal dumping enforcement, clean up, and prevention are identified in Table 6-2.

Clean-up of an illegal dumpsite

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Table 6-2. Illegal dumping clean-up responsibilities

Entity	Responsibility
Washington State Department of Ecology	Provides Local Solid Waste Financial Assistance - Community Litter Cleanup Program funding for cleanup to local agencies. Sets statewide policy.
Puget Sound Clean Air Agency	Responds to illegal dumping of materials where asbestos is suspected, such as some demolition materials, and addresses illegal dumping where incineration occurs.
Public Health - Seattle & King County	Primary enforcement agent for illegal dumping complaints on private property.
Department of Planning and Environmental Review	Provides code enforcement. Addresses junk and debris on private property.
Road Services Division	Responds to complaints and removes illegally dumped materials from public roads and rights of way in unincorporated King County.
Local Hazardous Waste Management Program	Addresses illegal dumping and mishandling of potentially hazardous waste materials.
Solid Waste Division	Responds to complaints about illegal dumping and litter near county solid waste facilities and manages: programs for illegal dumping cleanup, the Illegal Dumping Hotline, county-wide illegal dumping prevention programs, and the junk vehicle program.
Water and Lands Resources Division	Investigates illegal dumping and litter complaints involving surface water.
Cities	Enforce municipal littering and illegal dumping ordinances and provide cleanup of litter and illegally dumped material from city streets and properties.

The division also developed a program called the Community Cleanup Assistance Program, which enables environmental site inspectors from the county, cities, and other agencies to issue free disposal vouchers to property owners who are victims of illegal dumping.

Community Litter Cleanup

The division's Community Litter Cleanup Program, funded in part by a grant from Ecology, supports the cleanup of litter and illegal dumpsites on public lands and waterways in King County. The program also supports prevention and education, through advertising, signage, and other measures.

In 2016, litter crews cleaned up over 176 tons of debris from 151 sites. About 17 percent of the debris – including items such as tires, appliances, and junk vehicles – was recycled.

Secure Your Load

In accordance with state law, since 1994 the division has assessed a fee to the drivers of vehicles with unsecured loads arriving at its staffed transfer facilities and landfill. An unsecured load has not been fastened in or attached to the vehicle with tarps, rope, straps, netting, or chains, so as to prevent any part of the load or the covering from becoming loose, detached, or leaving the vehicle while it is moving.

According to the Washington State Department of Ecology's *Focus on Secured Loads* (Ecology 2009a), road debris causes about 400 accidents every year on Washington State highways and roughly 40 percent of litter on highways comes from unsecured loads.

The requirement to secure loads is in the *"Rules of the Road"* (RCW 46.61.655), which is enforced by the Washington State Patrol. State law (RCW 70.93.097) and King County Code (Title 10.12.040) require the division to charge an unsecured-load fee, which is assessed by scale operators.

In 2006, the division launched the Secure Your Load outreach program to raise public awareness of the importance of securing loads. The division has worked closely with the King County Sheriff's Office and the Washington State Patrol to enforce the law, and with Ecology and the Maria Federici Foundation to raise public awareness. In 2013, to strengthen its deterrent effect, the fee for an unsecured load arriving at a division facility was raised to $25. Division staff have received training from the Washington State Patrol to help them accurately identify unsecured loads and uniformly assess the fee. The increased fee for unsecured loads supports safe, clean communities.

Disposal Services after an Emergency

The *King County Operational Disaster Debris Management Plan* (Debris Management Plan)(KCSWD 2009) outlines the process for managing disaster debris within the boundaries of unincorporated King County and for coordinating with the 37 cities with which King County has interlocal agreements. The Debris Management Plan is aligned with other national, state, and county plans, including the 2014 *King County Comprehensive Emergency Management Plan*, as well as regulations and policies that will affect how King County manages disaster debris.

Debris management operations are grouped into three response levels – routine, medium, and high. The response level is determined by the division based on the geographic scope and impact of an actual or anticipated incident. Routine incidents are relatively common emergencies such as small landslides or minor flooding, which can be supported with existing resources and require minimal coordination.

- Routine incidents are relatively common emergencies such as small landslides or minor flooding, which can be supported with existing resources and require minimal coordination.
- Medium-impact incidents require more than routine coordination, and generally involve multiple jurisdictions. These include incidents such as moderate earthquakes, minor or moderate flooding in multiple locations, and storms with snow, ice, and/or high winds. The situation may require mutual aid or contract resources, and it may be necessary for the King County Executive to proclaim an emergency.
- High-impact incidents require a high degree of coordination and generally involve requests for state and federal assistance. These include incidents such as large earthquakes, severe flooding, or severe storms. In most cases, an emergency will have already been proclaimed by the King County Executive.

A regional approach to planning is essential for managing the multi-jurisdictional impacts of emergencies in the Puget Sound area and for coordinating the limited disposal capacity in western Washington. This disposal capacity is subject to two major constraints. First, most jurisdictions in the region export their solid waste to landfills east of the Cascade Mountains. Without local landfill space, disposal capacity relies on the region's transportation network, which could be compromised in a major emergency. Second, the only operational landfill in King County – Cedar Hills – does not accept for disposal construction and demolition debris – the most common aftermath of high-impact incidents - only municipal solid waste.

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The coordinated regional Debris Management Plan emphasizes recycling to the extent possible. The plan calls for the use of temporary debris management sites for storage of debris until it can be sorted for recycling or proper disposal. The division has worked with the King County Regional Communications and Emergency Coordination Center to coordinate public information and help cities and residents identify recycling options in preparation for and in response to emergency events of all types.

The ability to respond after a major regional emergency is one criterion that will be used to select a disposal option to be used once the Cedar Hills landfill closes.

Restoration of Closed Landfills

The division is responsible for maintaining and monitoring closed landfills that were constructed under different standards than those that guide landfill development today. Depending on the year the landfill closed, a minimum maintenance and monitoring post-closure period is specified in the Washington Administrative Code, but the timeline is not definite in state law. Although most of the closed landfills have reached the end of the required minimum post-closure period, regulations and the understanding of closure requirements have changed, requiring ongoing maintenance and monitoring. See Figure 6-1 for the location of the closed landfills.

Post-Closure Monitoring and Maintenance

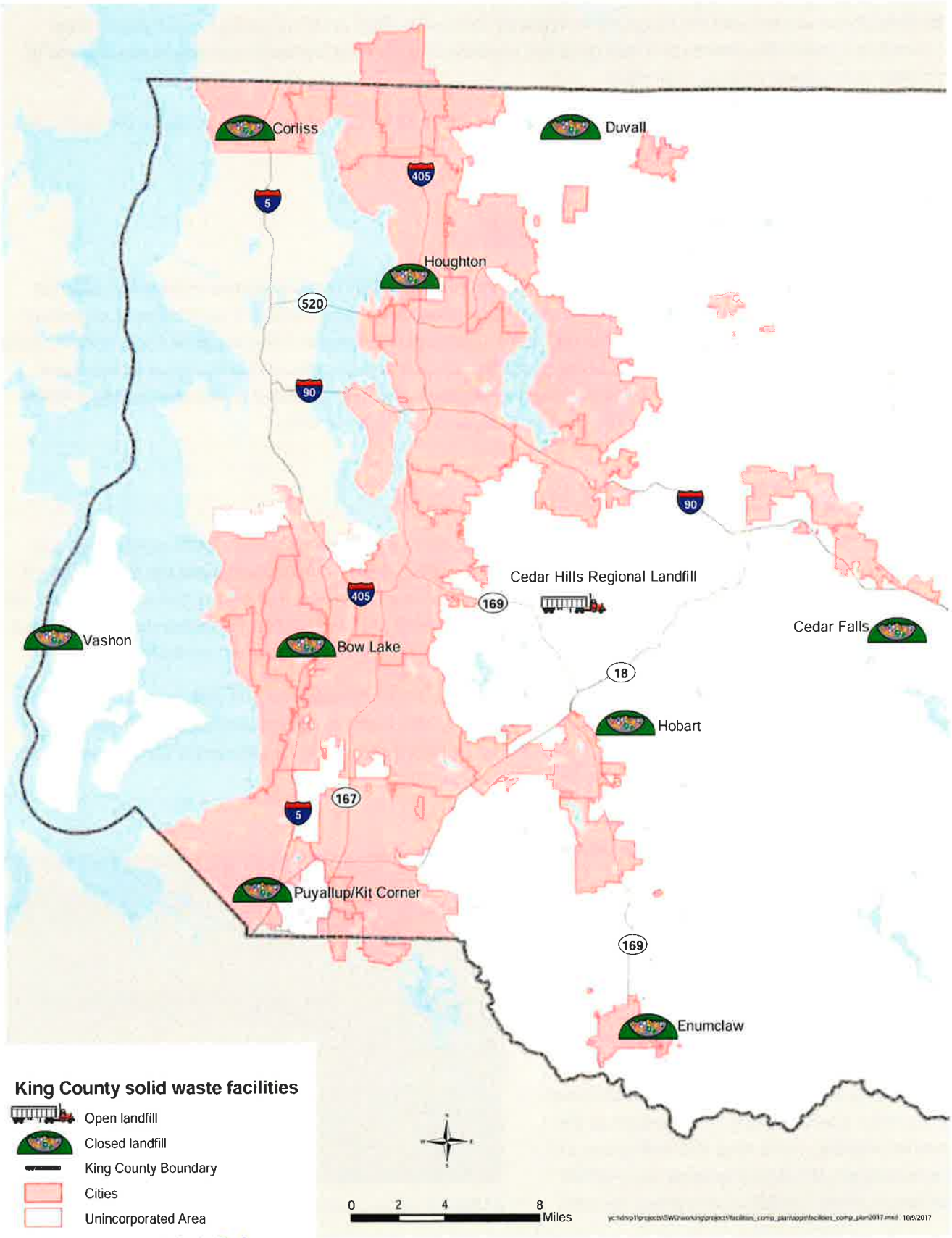
At seven of the nine closed landfills, the division routinely monitors groundwater, surface water, wastewater, and landfill gas. The Bow Lake and Corliss landfills were excavated to build new transfer stations on site, so very little, if any, waste is left and monitoring is no longer necessary. Studies are underway at the Vashon, Cedar Falls, Hobart, and Enumclaw landfills to determine what additional actions are needed for these landfills to reach a stable state. When a stable state has been reached, post-closure activities at these landfills may be reduced or terminated.

Under the current monitoring program, sampling data are collected from more than 180 groundwater, surface water, and wastewater monitoring stations, and approximately 100 landfill gas monitoring stations. These data are summarized in quarterly and annual reports submitted to the Washington State Department of Ecology and Public Health. Public Health also routinely inspects all of the closed landfills.

The closed landfills were constructed under different standards than those that guide landfill development today. With the exception of portions of the Vashon landfill constructed after 1989, they are unlined and do not, in some cases, incorporate all of the environmental control systems present in a modern landfill. Thus, the unique characteristics of each site – in particular the underlying geology, what lies downstream, and the waste that was originally placed in the landfill – play an important role in the post-closure needs of the site. These factors also influence the need for ongoing monitoring and maintenance of the existing landfill control systems. Since all but the Vashon closed landfill have reached the end

A bioberm at the Cedar Falls closed landfill filters landfill gas

Figure 6-1. Map of closed landfills



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of their required post-closure periods, each is being evaluated to determine what actions are required to bring the landfill to a stable state. In some cases, there may be no need to continue monitoring; at other sites, monitoring may continue at a reduced frequency and for a reduced range of constituents found in the medium being tested.

When the Cedar Hills landfill reaches capacity and closes, the bottom liner, capped top, and extensive gas and water control systems will inhibit releases to the environment for many years. Applicable regulations will define the minimum post-closure period (currently 30 years). Landfill closure is guided by the Resource Conservation and Recovery Act Title 40, Subtitle D, Part 258, Subpart F – Closure and Post-Closure Care, as well as Washington Administrative Code 173-351. The post-closure period may be shortened or lengthened based on the perceived risk to human health and the environment. After the post-closure period, there is expected to be some reduced level of monitoring and care to ensure the integrity of the cap and other environmental controls.

Beneficial Reuse of Landfill Properties

The county continues to examine possibilities for the beneficial reuse of closed landfill properties. While the presence of landfill control systems at these landfills can limit the types of beneficial reuse projects that can be implemented, such as at the Enumclaw landfill, the county has been successful in converting several properties wholly or in part to new purposes. Future beneficial uses also could create revenue opportunities.

Houghton landfill – Athletic fields were developed on the former Houghton landfill area.

Hobart landfill – Model airplane enthusiasts and an astronomy club use the open spaces of the Hobart landfill.

Duvall landfill – The county installed an 800-MHz radio tower outside of the refuse boundary of the Duvall landfill as part of its Emergency Communications Project.

Cedar Falls, Duvall, and Puyallup/Kit Corner landfills – Walking and cycling trails in the property buffers are used by area communities.

Other beneficial uses

The open spaces at closed landfills, often grassy areas surrounded by woods, provide habitat for diverse species of plants and animals. Closed landfills that currently provide homes to healthy populations of wildlife are Cedar Falls, Duvall, Hobart, Houghton, Puyallup/Kit Corner, and Vashon. Grass covers have been placed over all the landfills, engineered to suit the naturally occurring features and areas of potential enhancement at the properties. Vegetative covers at the Duvall and Puyallup/Kit Corner properties include planted trees and

Vegetative cover at the Duvall landfill

other vegetation to improve ground cover and water quality, as well as perches and nesting boxes for hawks and owls. The Cedar Falls and Duvall landfills are near the headwaters of large streams and provide cover and a source of food for birds, deer, coyote, and other woodland animals. Managing these properties as green space helps support the county's goals and policies for habitat preservation and increases carbon sequestration (i.e., reduces the total carbon emissions) at the properties.

Finding reuse opportunities for the closed landfill properties provides continued benefit to the surrounding communities, but the uses need to be compatible with the ongoing environmental monitoring at the sites. The division continues to explore beneficial reuse options for closed landfills, such as alternative energy farms (solar and wind) and sustainable forestry.

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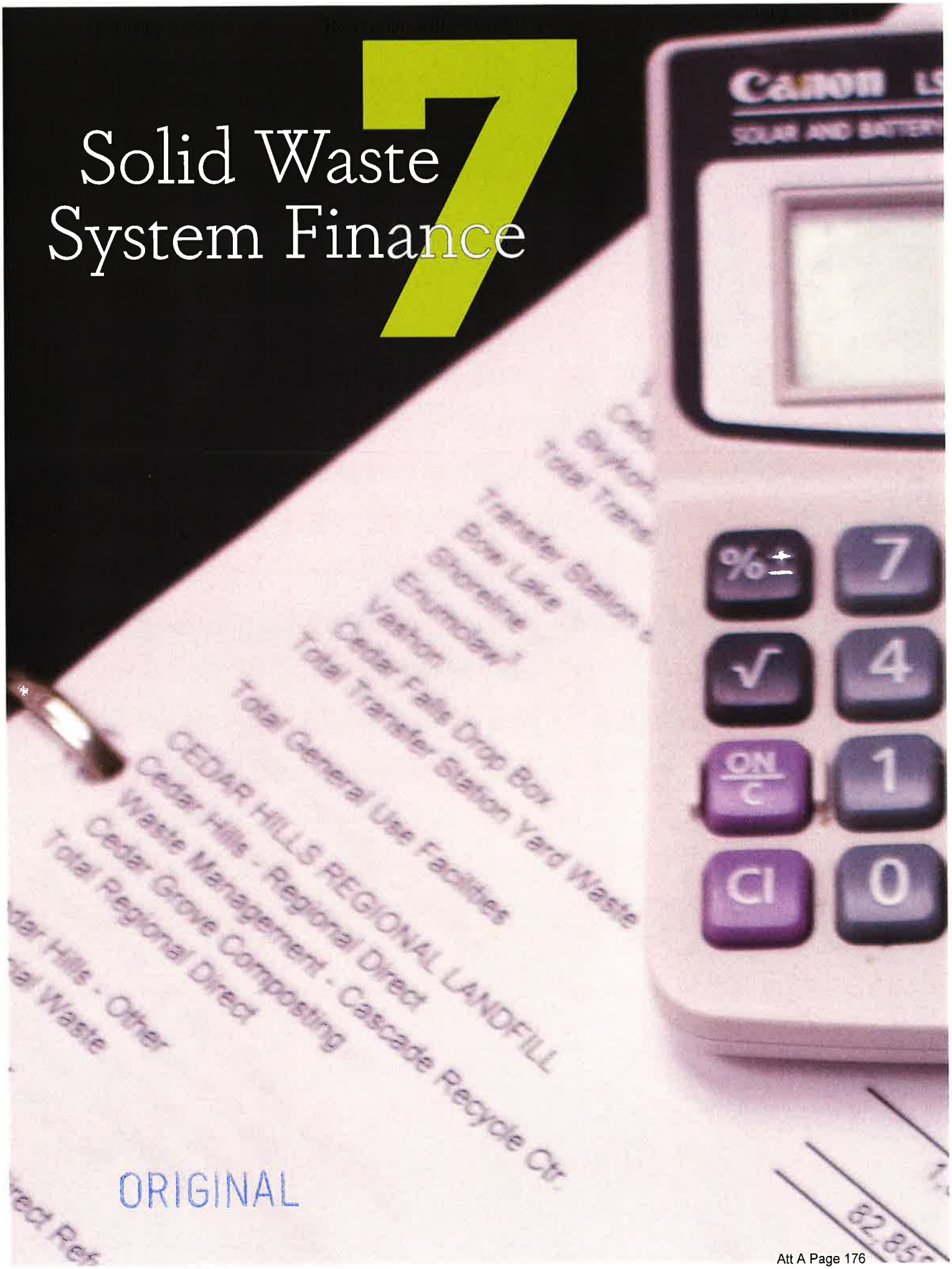
MAIN
DISPOSAL
SITE

7 Solid Waste System Finance



Policies

F-1 Keep tipping fees as low as reasonable, while covering the costs of effectively managing the system, protecting the environment, encouraging recycling and providing service to customers.

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Summary of Recommended Actions

The following table includes a menu of recommended actions that the county and the cities should implement. Under the responsibility column, the entity listed first has primary responsibility for the action, bold indicates that the entity has responsibility for the action, and a star (*) indicates that the action is a priority. If the responsibility is not in bold, the action has lower implementation priority.

Action Number and Responsibility	Action	Detailed Discussion
1-f County	Adopt the following as division practices:	
	• Assess fees for use of the solid waste transfer and disposal system at the point of service.	
	• The fee charged to customer classes will be the same at all facilities, unless the Metropolitan King County Council determines a change in the rate structure is necessary to maintain service levels, comply with regulations and permits, or to address low income needs.	Page 7-3
	• Utilize the assets of the King County Solid Waste Division consistent with the conditions established in the Amended and Restated Solid Waste Interlocal Agreement with the cities.	Page 7-9
	• The County General Fund will not charge use fees or receive other consideration from the Solid Waste Division for use of any transfer facility property in use as of November 6, 2013. The division's use of assets acquired by other separate County funds is subject to use fees. If the division ceases to use a property, all proceeds from the sale or other use of such property are due to the owner of record.	Page 7-1
	• Maintain reserve funds and routinely evaluate the funds for long-term adequacy and set contributions to maintain reasonable rate stability.	Page 7-5
	• Finance capital projects using an appropriate combination of cash and debt depending upon the life of the asset, financial benefits such as rate stability, and interest rates.	Page 7-6
	• Use solid waste fees to fund mitigation payments to cities for impacts directly attributable to solid waste facilities per Revised Code of Washington 36.58.080 and the Amended and Restated Solid Waste Interlocal Agreement.	Page 7-5
	• Use solid waste fees to fund required mitigation for solid waste facilities, including mitigation mandated by federal, state, and local regulations and permits.	Page 7-5

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Summary of Recommended Actions

1-f Continued	• Continue to evaluate and implement fiscally responsible operational changes to support a sustainable business model and maintain the assets of the solid waste facilities. • Include a target fund balance in the Solid Waste Division financial plan equal to at least 30 days of operating expenses. • Establish a minimum balance in the Rate Stabilization Reserve to mitigate the risks associated with a moderate-level economic recession. • Maintain the Landfill Post-Closure Maintenance Fund at a level to ensure that environmental monitoring and maintenance of the closed landfills will be fully funded through the end of their regulated post-closure maintenance periods, as defined by applicable law.	Page 7-8 Page 7-7 Page 7-7 Page 7-6
2-f County	Maintain a Solid Waste Division financial forecast and cash-flow projection of four years or more.	Page 7-3
3-f County	Subject to approval from the Metropolitan King County Council, define customer classes and establish equitable fees for each customer class based on services provided, benefits received, use of the system, and the costs, incurred or avoided, of providing those services.	Page 7-9
4-f County	Consider alternatives to the current rate methodology, such as incorporating a transaction fee into the rate structure.	Page 7-9
5-f County	Study the cost of providing services to self-haul customers, and to other customer classes if needed.	Page 7-9
6-f County	Consider discounts for low-income customers consistent with RCW 81.77.195.	Page 7-10
7-f County, cities	Continue to explore new revenue sources to help finance the solid waste system.	Page 7-10
8-f County, cities	The Executive may establish an Environmental Reserve Fund with revenue from solid waste fees for the benefit of the signatories to the Amended and Restated Interlocal Agreement.	Page 7-7
9-f County	Develop the procedures to establish and maintain the Rate Stabilization Reserve.	Page 7-7

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Summary of Recommended Actions

Action Number and Responsibility	Action	Detailed Discussion
10-f County	Maintain the following solid waste funds: • Landfill Reserve, • Landfill Post-Closure Maintenance, • Capital Equipment Recovery Program, and • Construction Fund.	Page 7-6
11-f County	When possible, manage solid waste rates through smaller, more frequent increases, which in combination with the rate stabilization reserve, smooths rate increases over time.	Page 7-3

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Solid Waste System Finance

Financial policies help guide the solid waste system's operations and investments. This chapter first provides a brief summary of the division's financial structure, including descriptions of funding sources, revenues, and expenditures. The remainder of the chapter describes a range of influences expected to have a financial impact on the division in the future.

Funding of Solid Waste Services and Programs

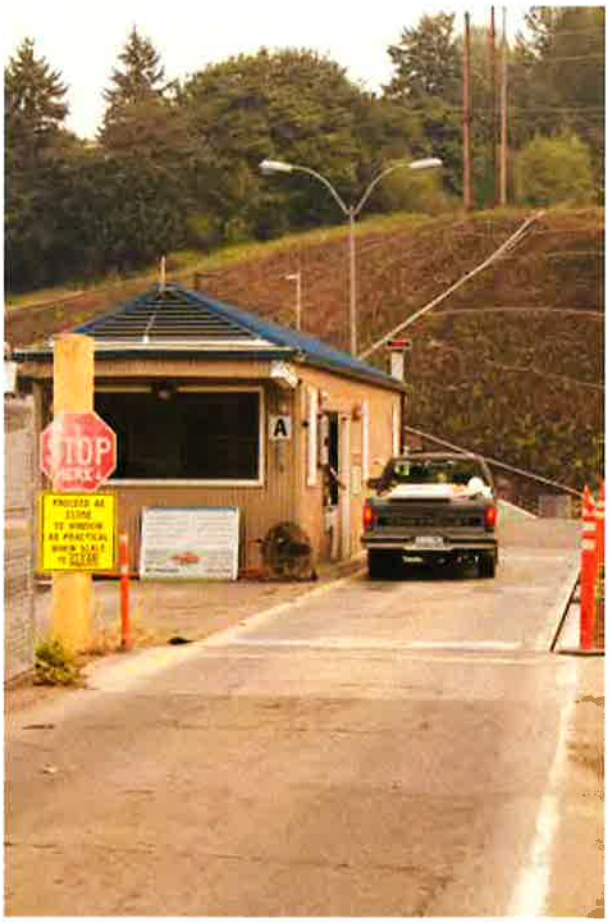
King County's solid waste transfer and disposal system is a public-sector operation that is funded almost entirely by fees collected from its customers. The division is an enterprise fund, managing nearly all of its expenses with revenues earned through these fees.

The fees charged at county facilities, called tipping fees, pay for the operation and maintenance of transfer and disposal facilities and equipment, education and promotion related to waste prevention and recycling, grants to cities to support waste prevention and recycling efforts, and administrative operating expenses and overhead.

Tipping fees also pay for the construction of transfer facilities. Bonds or loans may be used for large projects, but repayment of this debt is funded by tipping fees.

As discussed later in this chapter, through transfers into reserve funds, the fee paid for each ton of waste entering the system today covers the expenses involved in disposal of that waste, even if some costs are incurred decades in the future. Using this financial structure ensures that the full cost of solid waste handling is paid by the users of the system.

A summary of the fund structure is illustrated in Figure 7-1 and discussed in the following sections.



Customers pay a tipping fee at the scalehouse

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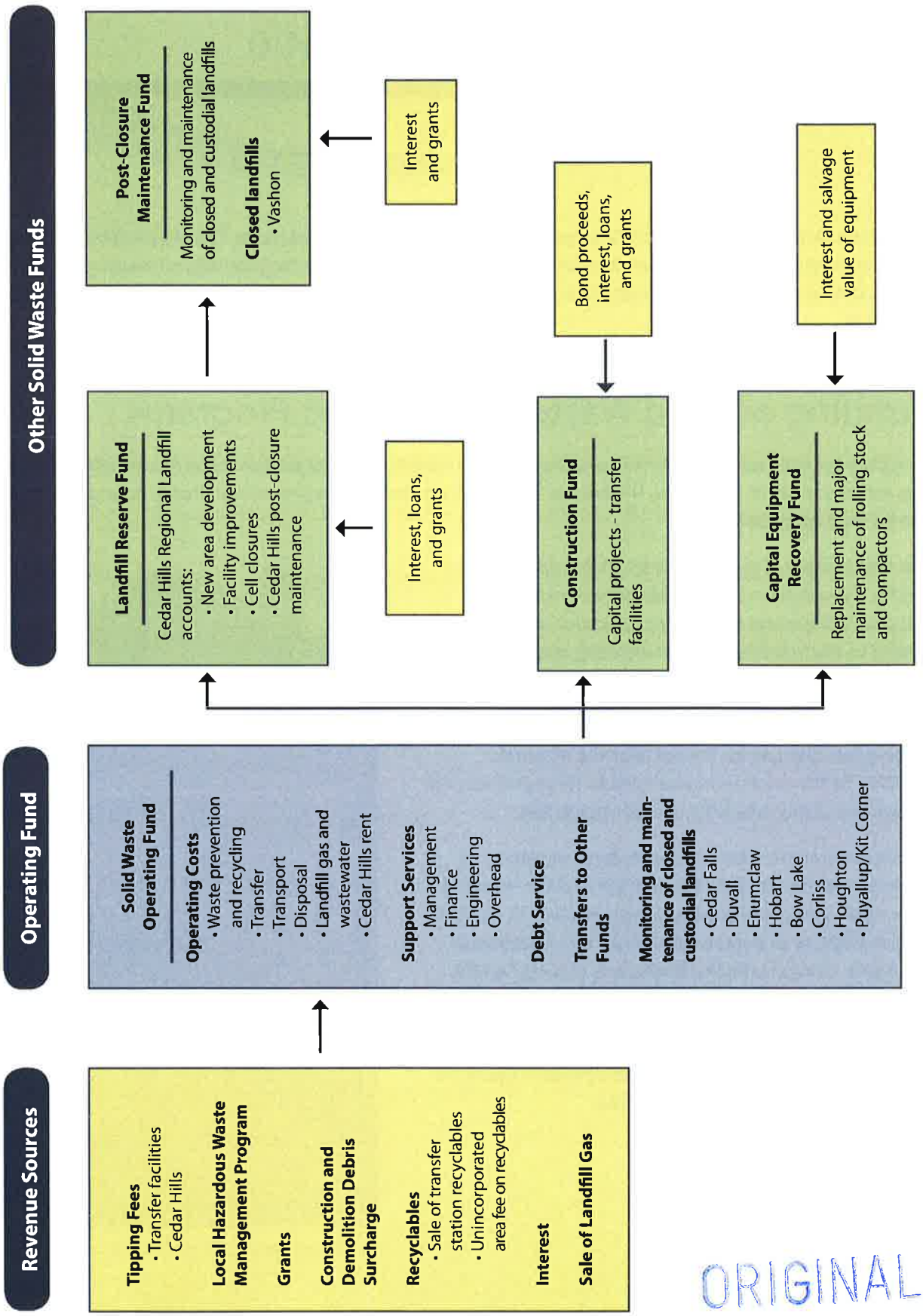
Figure 7-1. Solid Waste Division fund structure



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How Cities Fund Solid Waste Programs

Cities fund their solid waste and waste prevention and recycling programs in a variety of ways, and the resources available to the 37 cities in the King County system vary widely. Some cities receive revenue from fees paid for solid waste collection services. These fees may be paid directly to the city or to the collection company depending on who provides the collection service – the city itself or a commercial collection company – and what contractual arrangements have been made. In some cases, the collection companies charge a fee that is passed on to the city to fund their programs. Some cities also charge a utility tax. Another funding source for cities is state and county grants (see Chapter 4, *Sustainable Materials Management* for more information about grants). For cities that do not receive any revenue from collection, the only revenue sources for funding waste prevention and recycling programs may be grants and the city's general fund.

Solid Waste Division Revenues

As mentioned earlier, the solid waste system is funded primarily by the tipping fees charged at division facilities. The tipping fee is charged to the commercial collection companies that collect materials curbside and to residential and business self-haulers who bring wastes to the transfer facilities themselves. In accordance with KCC 10.08.040, the County Council establishes the fees charged at county solid waste facilities.

There are four main types of tipping fees:

Basic Fee – The per-ton fee charged to customers disposing of municipal solid waste at transfer facilities and to curbside collection vehicles at the Cedar Hills landfill. The basic fee accounts for about 97 percent of tipping fee revenues.

Regional Direct Fee – A discounted fee charged to commercial collection companies that haul solid waste to Cedar Hills in transfer trailers from their own transfer stations and processing facilities, thus bypassing county transfer stations.

Yard Waste and Clean Wood Fee – A fee for separated yard waste and clean wood delivered to facilities that have separate collection areas for these materials.

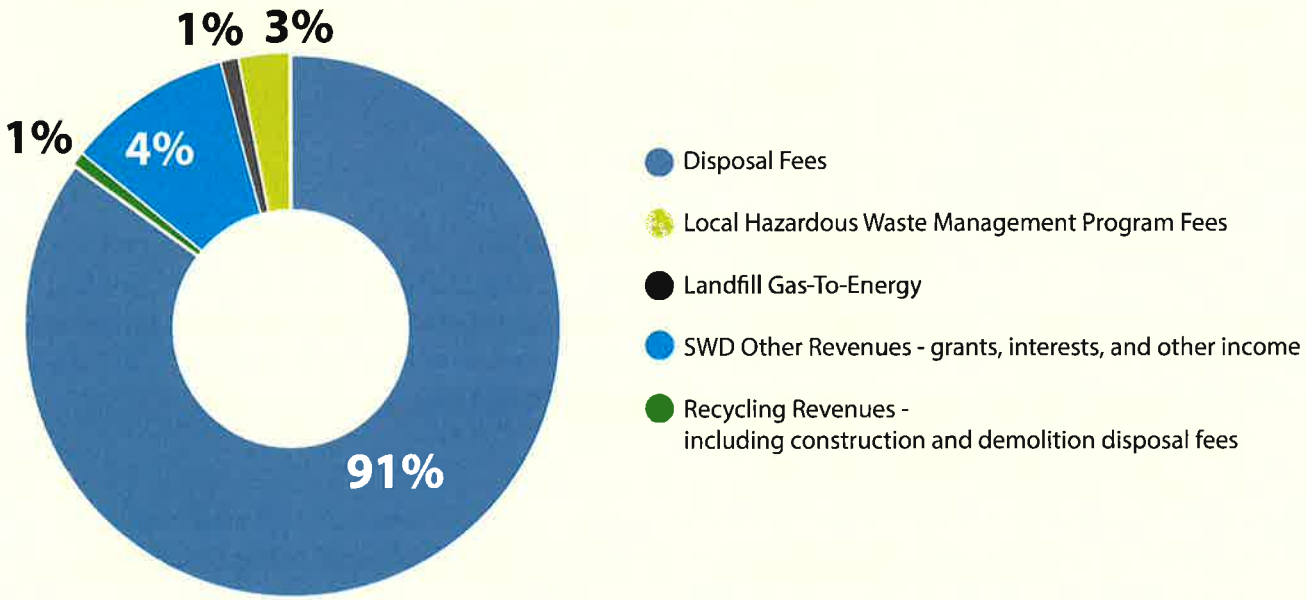
Special Waste Fee – The fee charged for certain materials that require special handling, record keeping, or both, such as asbestos-containing materials and contaminated soil. There are two different special waste fees that reflect the greater or lesser expense involved in handling and tracking different materials.

Other fees are charged for recyclables, such as appliances. KCC 10.12.021.G authorizes the division director to set fees for recyclable materials for which no fee has yet been established by ordinance. These fees may be set to encourage recycling and need not recover the full cost of handling and processing. In accordance with state law (RCW 70.93.097), the division also charges a fee to vehicles with unsecured loads arriving at any staffed King County transfer facility or the Cedar Hills landfill.

Figure 7-2 shows the breakdown of revenues as projected for 2017 and 2018 in the 2016 Rate Study. As shown, about 90 percent of the division's revenue comes from tipping fees. The remainder of the division's revenue comes from a

few additional sources. The most significant of those is the Local Hazardous Waste Management Program (LHWMP). Other sources of revenue include revenue from the sale of landfill gas from the Cedar Hills landfill; interest earned on fund balances; recyclables revenue, including revenue from both the sale of scrap metals received at division transfer facilities and from a fee on recyclables collected in unincorporated areas; fees collected from construction and demolition disposal; income from rental properties; fees collected on unincorporated area curbside accounts to support waste prevention and recycling education; and Washington State Department of Ecology grants to help clean up litter and illegal dumping throughout the county, as well as to support waste prevention and recycling. Based on economic and market conditions, revenues from these sources and interest earned can vary considerably.

Figure 7-2. Projected sources of revenue 2017 and 2018



Construction and Demolition Debris Surcharge

Starting in September 2015, management of the county's construction and demolition waste changed. In the past, the division had contracts with two private companies – Republic Services and Waste Management – to manage the majority of the county's construction and demolition debris. Under the new system, the division designates qualified facilities to accept and process construction and demolition debris.

In 2016, the division banned disposal of construction and demolition materials that have stable recycling markets. As future markets develop, more materials may also be banned. Materials that are brought to a designated facility for processing, but cannot be recycled, will incur a $4.25 per ton disposal surcharge that will be payable to the division. This system is designed to encourage recycling of construction and demolition materials. For more information, see Chapter 4, *Sustainable Materials Management*.

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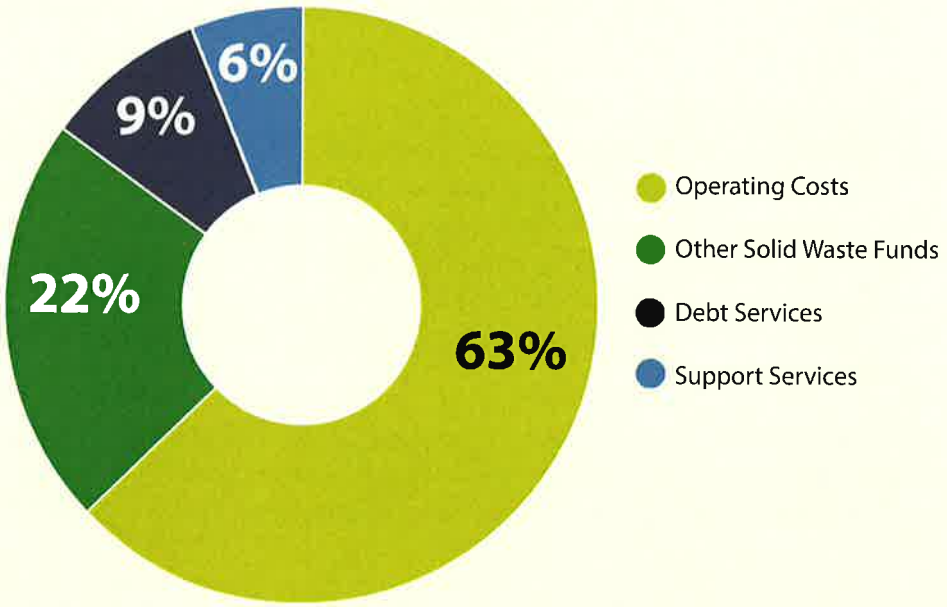
Solid Waste Division Expenditures

Division expenditures, can be divided into four broad categories: operating costs, support service costs, debt service, and transfers to other solid waste funds. The division maintains a target fund balance – an average balance in the Operating Fund sufficient to cover 30 days of direct operating expenses. Operating expenses are defined to exclude reserve funds. A rate stabilization reserve allows the accrual of funds to smooth out rate increases over time.

Figure 7-3 uses 2017-2018 projections to illustrate the various division expenditures, which are described in the following sections:

Figure 7-3. 2017 Budgeted expenditures



Operating Costs

Operating costs, which constitute the majority of all division spending, include the day-to-day expenses for transfer, transport, and landfill operations, maintenance of equipment and facilities, and management of landfill gas and wastewater. Operating costs also include business and occupation tax, and an emergency contingency to cover some costs related to weather-related events or other small emergencies. In addition, all but one of the closed landfills have met the obligatory number of years of post-closure care, but have on-going needs for monitoring and maintenance. Since the post-closure period has expired and maintenance and monitoring is still required, those projects are now funded by the Operating Fund.

Also included in the operating costs category is the rent that the division pays to the county's General Fund for use of the landfill property. Rent is based on a fair market property appraisal. An appraisal by Murray & Associates in 2012 determined a rent payment schedule for 2015 through 2025. Also included in operation costs are mitigation paid to cities for impacts directly attributable to solid waste facilities (RCW 36.58.080) as well as other mitigation related to construction or other activities as required by federal, state, and local regulations and permits. Similar to the cities' authorization to receive mitigation, and due to the longer life of the Landfill, the Road Services Division of the Department of Local Services will study the ability to charge the Solid Waste Division to mitigate impacts directly attributable to the regional facility, including wear and tear on nearby roads.

Another expense in this category is recycling costs. This includes grants to the cities and other waste prevention and recycling programs and services provided by the division.

Support Service Costs
This cost category includes functions that support operations, such as engineering, overhead, finance, administration, and planning.

Debt Service
Debt service is the payment of interest and principal on bonds and loans. Major transfer facility capital projects are generally financed by a combination of general obligation (GO) bonds backed by the full faith and credit of the county's General Fund and rate dollars in the Construction Fund. It is anticipated that with approval of the County Council, GO bonds will be issued for future transfer facility capital projects. Repayment of the debt will not extend beyond, and may be less than, the useful life of the facility. Additional factors that may be considered include but are not limited to: changes in disposal method, length of the ILA, bond market/bond rates, and waste generation.

To date, Cedar Hills landfill capital projects are not funded through debt financing, but through the Landfill Reserve Fund discussed later in this section.

Transfers to Other Solid Waste Funds
Transfers from the Operating Fund to reserve funds make up a portion of the division's costs. These reserve funds were established to ensure that the division can meet future obligations, or expenses, some of which are mandated by law. Contributions to reserve funds are routinely evaluated to ensure they are adequate to meet short- and long-term needs. Paying into reserve funds stabilizes the impact on rates for certain expenses by spreading the costs over a longer time period, and ensures that customers who use the system pay the entire cost of disposal. The three reserve funds – the Capital Equipment Recovery Program Fund, the Landfill Reserve Fund, and the Post-Closure Maintenance Fund – are discussed below.

Bond proceeds and contributions from the Operating Fund to the **Construction Fund** are used to finance new construction and major maintenance of division transfer facilities and some closed landfill mitigation projects. Contributions from the Operating Fund to the Construction Fund result in less borrowing, and consequently, a lower level of debt service.

The **Capital Equipment Recovery Program Fund** (CERP) is codified in KCC 4A.200.680. The purpose of the CERP is to provide adequate resources for replacement and major maintenance of solid waste rolling stock (primarily long-haul trucks and trailers) and stationary compactors. New equipment is purchased from the Operating Fund, but after the initial purchase, replacements are funded from the CERP.

By accumulating funds in the CERP, the division is able to cover the expense of replacing needed equipment without impacting rates, even while revenue fluctuates. Annual contributions to the CERP are calculated by projecting future replacement costs, salvage values, and equipment life. Contributions are adjusted to reflect changes in facilities and operations that affect equipment needs. The contributions are held in an account, earning interest, until needed.

The CERP Fund provides resources for replacement and major maintenance of equipment

The **Landfill Reserve Fund** (LRF), codified in KCC 4A.200.390, covers the costs of four major accounts maintained for the Cedar Hills landfill, which are described on the following page:

- **New area development account** – Covers the costs for planning, designing, permitting, and building new disposal areas.
- **Facility improvements account** – Covers a wide range of capital investments required to sustain the infrastructure and operations at the landfill, such as enhancements to the landfill gas and wastewater systems.
- **Closure account** – Covers the cost of closing operating areas within the landfill that have reached capacity. Mandated by federal and state law, these contributions help the division prepare incrementally for the cost of final closure of the entire landfill.
- **Post-closure maintenance account** – Accumulates funds to pay for post-closure maintenance of the Cedar Hills landfill for 30 years. This account is also mandated by federal and state law.

The sum of all four accounts, based on projected cost obligations, makes up the LRF contribution from the Operating Fund. Projected cost obligations are based on the current plan for the landfill. When Cedar Hills closes, the division will discontinue its contributions to the LRF. After final closure, the balance of the LRF will be transferred to the Post-Closure Maintenance Fund to pay for Cedar Hills' post-closure maintenance and monitoring.

The **Post-Closure Maintenance Fund**, codified in KCC 4A.200.710, is a separate fund that pays for the maintenance and environmental monitoring of the Vashon landfill – the only closed landfill that is still within the regulatory period set in 40 CFR 258.61 and Washington Administrative Code 173-351-600 (see Chapter 6, Landfill Management and Solid Waste Disposal).

In addition to the funds mentioned above, the division is investigating the establishment of an Environmental Reserve, as discussed in the Amended and Restated ILA. The purpose of such a fund would be to help to pay for any environmental liabilities not already covered by system rates or insurance. The fund would be retained for a minimum of 30 years following the closure of the Cedar Hills Landfill.

A stormwater pond at the Cedar Hills Landfi ll is part of the infrastructure paid for by the Facility Improvements Account

Target Fund Balance

The division's current practice is to retain an average balance in the operating fund sufficient to cover at least 30 days of direct operating costs.

Minimum Rate Stabilization Reserve

FCS Group conducted a rate structure analysis (KCSWD 2017d), and reported that the division suffered an 11 percent reduction in Basic Fee revenue over a two-year period during the Great Recession. For comparison, during the more moderate 2001 Dot-Com Bust, Basic Fee revenue decreased by four percent in that two-year period.

To mitigate the risks associated with a moderate-level economic recession, holding five percent of annual revenues as a minimum Rate Stabilization Reserve balance would provide for a moderate-level recession slightly more severe than the Dot-Com Bust, but not for an outlier like the Great Recession.

Preparing for two years of reduced revenues fits with the County's two-year budgeting cycle. Presumably, the Council would be able to pass any needed recession response measures within two years, and the division would not need to carry excessive reserves. The division is developing specific procedures for maintaining recession reserve monies to include access to and replenishment of funds.

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Influences on Future Costs and Revenue

In addition to the unanticipated increases or reductions in tonnage due to the economy, there are other factors that can be expected to influence costs and revenues. These factors, which can be projected and budgeted for with varying degrees of certainty, are summarized below.

Interest Earnings

The division's reserve funds are invested to earn interest during the years, or even decades, before the funds are needed. This is particularly significant for the long-term Landfill Reserve Fund, which will finance landfill closure and 30 years of post-closure care, a period expected to run from about 2028 (the currently approved capacity) through 2058, or if expanded capacity is approved, for about 30 years after Cedar Hills reaches its maximum disposal capacity, making interest earnings a considerable factor in the amount that needs to be put aside. In 2013, the value of interest earned was less than inflation. Starting in 2018, a small increase in interest above inflation is expected through 2026. The county is looking at how the funds might be invested differently consistent with County guidelines to earn a higher rate of return.

Waste Prevention and Recycling

As discussed earlier, revenues from garbage tipping fees cover the costs of waste prevention and recycling services and programs. This financing structure requires the division to estimate the effects of waste prevention and recycling on garbage disposal to reasonably project future revenues.

While the revenue stream relies primarily on garbage tipping fees, the current priorities in solid waste management are waste prevention and recycling, which lead to reductions in the amount of solid waste disposed and therefore in revenues received. The reduction in the amount of waste received due to waste prevention, recycling and product stewardship has been gradual, and the system has adjusted to lower revenues. Further reductions through increasingly rigorous waste prevention and recycling efforts will continue to affect the revenues of King County and other jurisdictions across the state. The state's *Moving Washington Beyond Waste and Toxics, 2015 Update* recognizes that, "Local governments in particular are concerned about how to sustain funding for programs when the goal is to reduce waste disposal, the source of most funding" (Ecology 2015). The county completed a *Sustainable Solid Waste Management Study* (KCSWD 2014a) that looked at multiple strategies, technologies and services that the division could employ to increase recycling and manage solid waste. One of the strategies suggested by the study is to develop a sustainable financing model that is aligned with waste prevention and recycling (KCSWD 2014a).

Increased waste prevention and recycling efforts have had positive influences on the financial aspects of the system as well. As discussed in Chapters 4 and 6, waste prevention and recycling have contributed to extending the life of the Cedar Hills landfill, which will save money for ratepayers. Another aspect of waste prevention and recycling that has had a positive financial effect is product stewardship. Product stewardship shifts the management of materials at the end of their life to the product manufacturer. This shift reduces the costs to cities and counties of managing products such as televisions, computers, and fluorescent bulbs and tubes, to name a few. The savings are most substantial for products that contain hazardous materials and are more difficult and expensive to manage within the public collection, transfer, and disposal system.

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Operational Efficiencies

The division continually seeks to eliminate waste and variability in its operations. This commitment ensures the division's ability to provide value to its customers, while improving the quality of service, controlling costs, and upholding the county's environmental goals. Examples of operational efficiencies that are producing significant and long-term results are discussed briefly below.

Landfill tippers are an efficient way to empty transfer trailers

Landfill Tippers

The division uses tippers to empty garbage from transfer trailers at the landfill. The tippers replaced the use of older walking floor trailers (see Chapter 5, *Landfill Management and Solid Waste Disposal*, for more details). Tippers save staff time and other resources, as well as reduce equipment and tire damage.

Solid Waste and Cardboard Compactors

As discussed in Chapter 4, the transfer system in King County is undergoing major renovations to update station technology, improve efficiencies, and enhance environmental sustainability. The installation of solid waste compactors is one important component of that plan. The Bow Lake, Enumclaw, Shoreline, Factoria, and Vashon stations currently have waste compactors. All newly constructed recycling and transfer stations will incorporate compactors as well.

Compacting solid waste at the stations reduces the number of trips necessary to transport the waste by up to 30 percent. Fewer trips translate directly into lower costs for fuel, equipment, and staff. For instance, in the first six months of operation at the Bow Lake Recycling and Transfer Station, the use of a compactor saved almost 900 trips and over 8,400 gallons of diesel fuel.

In addition to solid waste compactors, the division is installing cardboard compactors at many of the stations. These compactors will allow the division to reduce the number of trips needed to pick up the bales.

Potential Changes in the Fee Structure

The division may propose changes to the current fee structure in future rate studies. Possible changes include establishing different customer classes, discounts for low income customers, and moving some costs from the fee charged at transfer facilities and the landfill to a fee on the curbside collection bill. In the 2014 *Sustainable Solid Waste Management Study* (KCSWD 2014), one of the recommendations was to look at revising the fee structure. The division completed a rate restructure study in 2017 and will be discussing with stakeholders what a rate restructure might entail (KCSWD 2017d).

To equitably allocate the benefits and costs of transfer system improvements, the division may consider different customer classes. The customer classes would take into consideration the services provided, benefits received, use of the system, and the costs (incurred or avoided), of providing those services. An example of a customer class would be self-haul customers or commercial customers at the transfer stations.

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In 2010, legislation was passed authorizing the Washington Utilities and Transportation Commission to approve discounts for low-income customers under certain circumstances. For the first time, the division is proposing a low-income discount in its 2019-2020 Rate Proposal (KCSWD 2018b).

Before changes to the fee structure are proposed, the division is studying a number of factors, including the impact on revenue and cost, equity issues, and system-wide financing implications. These factors will be considered in future rate studies.

Closure of the Cedar Hills Regional Landfill

When Cedar Hills reaches capacity and closes, the division's solid waste tipping fee is expected to increase to cover the cost of using an alternate means of disposal. Whether it is export to an out-of-county landfill, disposal at a waste-to-energy facility, or other conversion technology, past studies, as well as a recent preliminary study, indicate that the cost for disposal after Cedar Hills closes will be higher (KCSWD 2017c) (see Chapter 6, *Landfill Management and Solid Waste Disposal* for further discussion).

New Revenue Sources

The division is continually exploring new sources of revenue to help offset reductions in tonnage. Cities may also want to consider additional funding sources to support their solid waste and waste prevention and recycling programs.

Sales from the Landfill Gas-to-Energy Facility

An example of the successful development of a revenue source is the sale of landfill gas. In 2009, a landfill gas-to-energy facility began operations at Cedar Hills, and the division began to receive revenues from the sale of landfill gas. The facility, which is privately owned and operated by Bio Energy Washington , converts methane collected from the landfill into pipeline quality natural gas, which it sells to Puget Sound Energy.

The Bio Energy Washington plant at Cedar Hills landfill converts landfill gas to pipeline quality gas

In addition, the environmental attributes from the pipeline quality gas produced by the landfill gas-to-energy facility at Cedar Hills have value in the market and offer another ongoing source of revenue. The division, rather than the owner of the landfill gas facility, Bio Energy Washington , has contractually retained the environmental attributes associated with the project. In January of 2011, the County Council unanimously approved an ordinance authorizing the division to enter into a contract to sell the environmental attributes associated with the landfill gas-to-energy project to Puget Sound Energy. This contract is structured so

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that the county shares in profits that Puget Sound Energy gets when selling the environmental attributes associated with the gas. The division receives revenue for both the gas and the environmental attributes associated with the gas. The revenue received by the division is highly volatile, and has ranged from $1 to $7 million per year, depending on production rates and the market price.

Resource Recovery at Transfer Stations

Significant amounts of recyclable materials – notably wood, metal and cardboard - are disposed at the transfer stations. The division is implementing new approaches, such as sorting the recyclable materials on the tipping floor and banning certain materials from disposal, to recover more of these materials at the transfer stations. Revenues from the sale of these materials help offset the costs of sorting and equipment. (see Chapter 5, *Solid Waste Transfer and Processing System* for further discussion).

Fees from Materials Collected at the Transfer Stations

King County Code (KCC 1 0.12.021.G) does not require that fees for recyclables recover the full costs of handling and processing recyclable materials. Therefore the fees can be set lower to encourage recycling over disposal. In fact, for materials such as the standard curbside recyclables collected at the transfer stations, there is currently no fee at all, even though the division pays the cost of transport and processing. As collection services for more recyclable materials are added at transfer facilities and more tons of materials are recycled, fees will be evaluated on a regular basis and adjusted as necessary to optimize the financial and environmental benefits.

The division will continue to explore innovative opportunities, such as partnering with the private sector or other public agencies, to earn additional revenues and achieve savings through operational efficiencies. Although, these efforts may involve relatively small amounts of money, cumulatively they contribute to stabilizing rates for solid waste customers.

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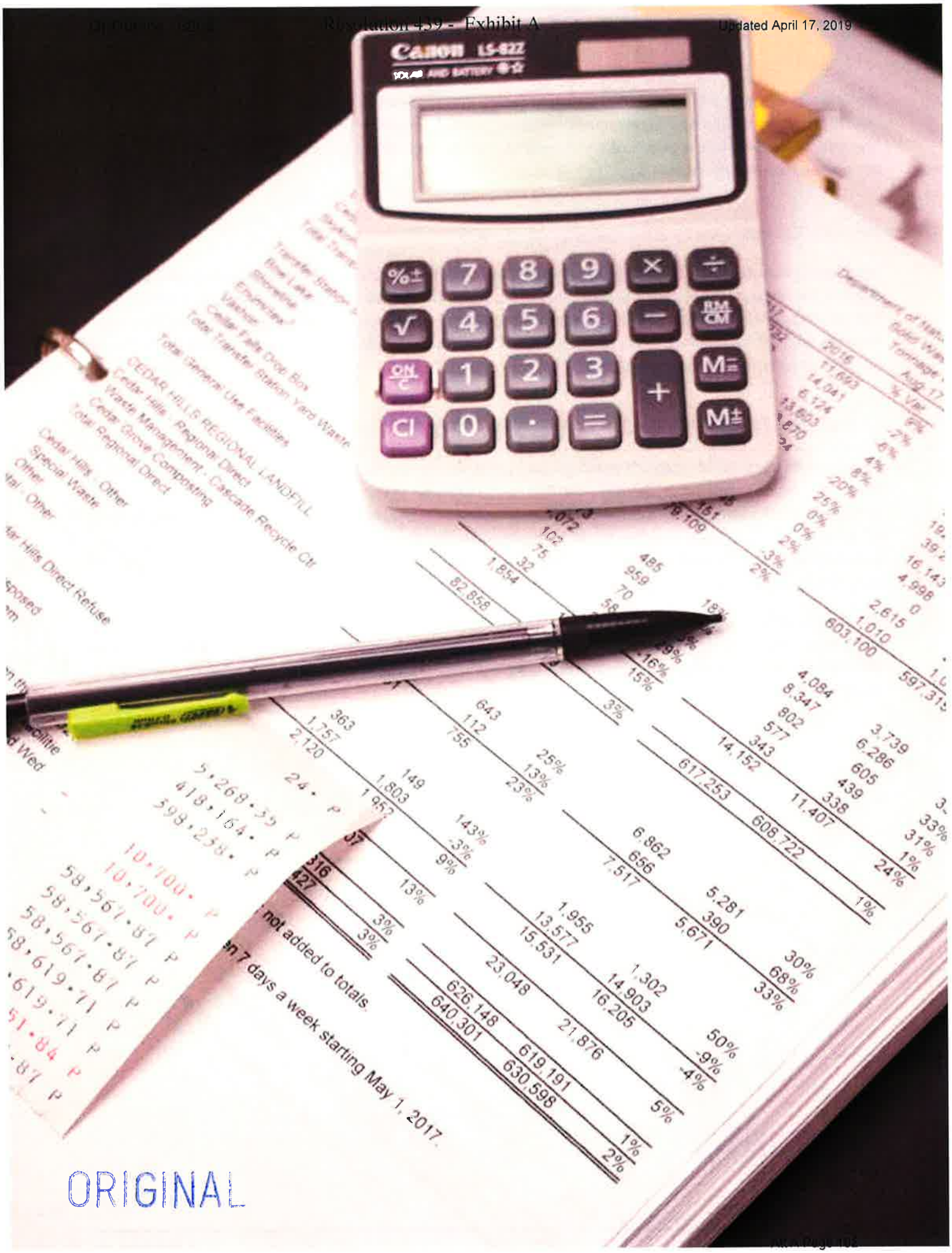
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VARIOUS MARKED UP PRINTS CH
FENCE PLAN 1881 CH
CH TOPOGRAPHIC 11/14/85
CH TOPOGRAPHIC 3/20/86
CH TOPOGRAPHIC 3/20/86
TOPOGRAPHIC 3/21/83
CH TOPOGRAPHIC 3/21/83
CH TOPOGRAPHIC 4/13/84
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TOPOGRAPHIC 4/4/60

Appendix A

Utilities and Transportation Commission Cost Assessment

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Washington Utilities and Transportation Commission
Cost Assessment

This plan is prepared for King County and its incorporated cities, excluding Seattle and Milton.

Prepared by: King County Solid Waste Division

Contact: Meg Moorehead, Strategy, Communications & Performance Manager

Date: May 17, 2018

DEFINITIONS

Throughout this document:

Year 1 refers to 2018
Year 3 refers to 2020
Year 6 refers to 2023

Year refers to calendar year January 1 – December 31

1. DEMOGRAPHICS

The King County solid waste system comprises 37 of the 39 cities in the county (including all but the cities of Seattle and Milton) and the unincorporated areas of King County. In all, the county's service area covers approximately 2,050 square miles. There are about 1.45 million residents and 840,000 people employed in the service area.

1.1. Population

1.1.1. Population for the entire King County

Year 1:	2,166,600
Year 3:	2,257,800
Year 6:	2,297,000

1.1.2. Population for the King County solid waste system

Year 1:	1,472,384
Year 3:	1,503,363
Year 6:	1,533,750

1.2. References and Assumptions

Projections for population are based on data developed by the Puget Sound Regional Council (PSRC; 2017). Data provided by PSRC are based on U.S. Census and other data sources and developed in close cooperation with the county and the cities.

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2. WASTE STREAM GENERATION

2.1. Tonnage Recycled

Year 1: 1,032,873 (52% recycling)
Year 3: 1,090,977 (52% recycling)
Year 6: 1,179,649 (52% recycling)

2.2. Tonnage Disposed

Year 1: 953,421
Year 3: 1,007,056
Year 6: 1,088,907

2.3. References and Assumptions

The division uses a planning forecast model to predict future waste generation, which is defined as *waste disposed + materials recycled*. The forecast is used to guide system planning, budgeting, rate setting, and operations. The primary objectives of the model are to: 1) estimate future waste disposal and 2) provide estimates of the amount of materials expected to be diverted from the waste stream through division and city waste prevention and recycling programs. The tonnage forecast is described in more detail in Chapter 3 of the Plan.

3. SYSTEM COMPONENT COSTS

This section addresses costs associated with current programs and those recommended in the draft plan.

3.1. Waste Reduction and Recycling Programs

Many programs address waste reduction and prevention as well as recycling; therefore, they are presented here together.

3.1.1.Programs

- Education and promotion campaigns
- EcoConsumer program
- Grants to cities to support waste prevention and recycling
- Product stewardship support and promotion – "Take it Back Network"
- Construction and demolition debris waste prevention and recycling education and promotion
- Sustainable building education and promotion
- LinkUp program
- Organics management program
- Master Recycler composter program
- School programs
- Special recycling collection events
- Green Holidays program
- Transfer facility recycling

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Detail on current programs and proposed waste prevention and recycling programs, primarily building on current efforts, are presented in the recommendations in Chapter 4 of the Plan.

3.1.2. The costs of waste reduction and recycling programs (including transfer station recycling) implemented and proposed are estimated to be:

Year 1: $12,150,041
Year 3: $10,447,707
Year 6: $12,730,951

3.1.3. Funding mechanisms:

Year 1:	
Disposal fees	$11,871,402
Grants	118,639
Unincorporated area recycling fee	160,000
Year 3:	
Disposal fees	$10,167,069
Grants	120,639
Unincorporated area recycling fee	160,000
Year 6:	
Disposal fees	$12,468,313
Grants	102,639
Unincorporated area recycling fee	160,000

3.2. Recycling Programs – see 3.1, combined with Waste Reduction Programs

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3.3 Solid Waste Collection Programs

3.3.1 UTC Regulated Solid Waste Collection Programs

Data for 2017 and estimates for 2018, 2020 and 2023 are shown below:

UTC Regulated Hauler Name: Waste Management of Washington, Inc.
G-permit #: G-237 720 4th Ave, Ste 400 Kirkland WA 98033

	2017	Yr 1 2018	Yr 3 2020	Yr 6 2023
Residential				
# of Customers	37,974	38,378	39,187	39,979
Tonnage (garbage, YW & recycling)	61,060	62,519	66,036	71,403
Commercial				
# of Customers	1,346	1,360	1,389	1,417
Tonnage Collected (garbage only)	26,487	27,119	28,645	30,973

UTC Regulated Hauler Name: American Disposal Company, Inc.
G-permit #: G-87 4662 70th Ave E, Puyallup WA 98371

	2017	Yr 1 2018	Yr 3 2020	Yr 6 2023
Residential				
# of Customers	2,074	2,096	2,140	2,183
Tonnage (garbage, YW & recycling)	1,486	1,522	1,608	1,738
Commercial				
# of Customers	215	217	222	226
Tonnage Collected (garbage only)	1,411	1,444	1,526	1,650

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UTC Regulated Hauler Name: **Fiorito Enterprises, Inc. & Rabanco Companies**
G-permit #: G-60 **22010 76th Ave S, Kent WA 98032**

	2017	Yr 1 2018	Yr 3 2020	Yr 6 2023
Residential				
# of Customers	25,343	25,613	26,152	26,681
Tonnage (garbage, YW & recycling)	36,564	37,438	39,544	42,758
Commercial				
# of Customers	520	526	537	547
Tonnage Collected (garbage only)	13,440	13,761	14,536	15,717

UTC Regulated Hauler Name: **Rabanco LTD, 1600 127th Ave NE Bellevue WA 98005**
G-permit #: G-12 **1600 127th Ave NE, Bellevue WA 98005**

	2017	Yr 1 2018	Yr 3 2020	Yr 6 2023
Residential				
# of Customers	7,848	7,932	8,099	8,262
Tonnage (garbage, YW & recycling)	13,300	13,618	14,384	15,553
Commercial				
# of Customers	203	205	209	214
Tonnage Collected (garbage only)	9,434	9,660	10,203	11,032

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3.3.2 Other (non-regulated) Solid Waste Collection Programs

Data for 2017 and estimates for 2018, 2020, and 2023 are shown below.

Hauler Name:	Republic Services			
	2017	Yr 1 2018	Yr 3 2020	Yr 6 2023
Residential				
# of Customers	123,174	124,485	127,108	129,677
Tonnage (garbage, YW & recycling)	232,390	237,941	251,327	271,754
Commercial				
# of Customers	5,400	5,457	5,572	5,685
Tonnage Collected (garbage only)	196,424	201,116	212,430	229,696

Hauler Name:	Recology			
	2017	Yr 1 2018	Yr 3 2020	Yr 6 2023
Residential				
# of Customers	63,872	64,552	65,912	67,244
Tonnage (garbage, YW & recycling)	118,391	121,219	128,039	138,445
Commercial				
# of Customers	2,324	2,349	2,398	2,447
Tonnage Collected (garbage only)	86,337	88,399	93,372	100,961

Hauler Name:	Waste Management of Washington, Inc.			
	2017	Yr 1 2018	Yr 3 2020	Yr 6 2023
Residential				
# of Customers	84,442	85,341	87,139	88,900
Tonnage (garbage, YW & recycling)	168,584	172,611	182,321	197,140
Commercial				
# of Customers	5,479	5,610	5,925	6,407
Tonnage Collected (garbage only)	136,633	139,896	147,766	159,776

Hauler Name:	**City of Enumclaw**			
	2017	Yr 1 2018	Yr 3 2020	Yr 6 2023
Residential				
# of Customers	3,621	3,660	3,737	3,812
Tonnage (garbage, YW & recycling)	4,494	4,602	4,861	5,256
Commercial				
# of Customers	3,621	3,660	3,737	3,812
Tonnage Collected (garbage only)	2,835	2,903	3,067	3,316

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3.4 Energy Recovery & Incineration (ER&I) Programs

Not applicable – the Solid Waste Division has no such program.

3.5 Land Disposal Program

3.5.1 Landfill Name: Cedar Hills Regional Landfill
Owner: King County
Operator: King County Solid Waste Division

3.5.2 The approximate tonnage disposed at the landfill by UTC regulated haulers is expected to be:

Year 1: 94,716
Year 3: 100,044
Year 6: 108,176

3.5.3 The approximate tonnage disposed at the landfill by other contributors is expected to be:

Year 1: 858,705
Year 3: 907,012
Year 6: 980,731

3.5.4 Landfill operating and capital costs are estimated to be:

Year 1: $46,973,382

Year 3: $55,365,039

Year 6: $51,868,163

3.5.5 Landfill funding:

Tipping fees

3.6 Administration Program

3.6.1 Budgeted cost and funding sources:

Budgeted Cost	Funding Source
Year 1: $40,785,701	Tipping fees
Year 3: $40,827,859	Tipping Fees
Year 6: $52,185,563	Tipping fees

3.6.2 Cost components included in these estimates are:

All Operating Expenditures except for direct cost components of Transfer Operations, Disposal Operations, and ancillary operating units.

3.6.3 Funding mechanisms

Around 90 percent of the division's revenue comes from tipping fees charged at transfer facilities and the Cedar Hills landfill. The remainder comes from a few additional sources, including interest earned on fund balances, a surcharge on construction and demolition (C&D), revenue from the sale of recyclable materials received at division transfer facilities, a fee on recyclables collected in

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unincorporated areas, and grants to help clean up litter and illegal dumping throughout the county and to support WPR. Other than grant funds, all revenue sources support all programs.

3.7 Other Programs

3.7.1 The Transfer Services System Program is described in Chapter 5 of the Plan. It includes the division's recycling and transfer stations, private facilities that handle construction and demolition debris (C&D), and household hazardous waste (HHW) service, which is covered in detail by the Local Hazardous Waste Management Plan.

3.7.2 The division owns and operates eight transfer stations and two drop boxes. Allied Waste and Waste Management own and operate facilities that handle C&D. The division operates HHW service at its Factoria transfer station and provides Wastemobile service via a contractor.

3.7.3 The UTC regulates the C&D facilities.

3.7.4 Solid Waste Division Costs

3.7.4.1 Transfer facility operating and capital costs are estimated to be:

Year 1: $61,022,952

Year2: $68,229,939

Year 3: $80,090,023

3.7.4.2 HHW service costs are estimated to be: NA

3.7.5 The major funding source for division transfer operations is tipping fees. Capital costs are paid from the construction fund; bond proceeds and contributions from the operating fund (tipping fees) are deposited into the construction fund. The cost of providing HHW service is funded by the LHWMP.

3.8 References and Assumptions

The estimate for year 1 costs is from actual 2018 costs to-date plus projected costs for the remainder of the year; years 3 and 6 were increased to account for inflation, tonnage projections, and expected program additions. The collection program estimates were derived using hauler reports and a projected rate of population increase in King County. Numbers have been rounded in most instances.

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4 FUNDING MECHANISMS

Table 4.1.1 Facility Inventory

Facility Name	Type of Facility	Tip Fee per Ton	Estimated Transfer and Transportation Cost**	Transfer Station Location	Final Disposal Location	Total Tons Disposed	Total Revenue Generated (Tip Fee x Tons)
King County Transfer Stations	Transfer Station	$134.59	$61,022,952	King County	Cedar Hills Landfill	922,121	$124,108,265
Regional Direct Cedar Hills	Landfill	$114.00			Cedar Hills Landfill	9,000	$1,026,000
Special Waste Cedar Hills	Landfill	$162.00			Cedar Hills Landfill	2,300	$372,600
Commercial Haul Cedar Hills	Landfill	$134.59			Cedar Hills Landfill	20,000	$2,691,800
Yard Waste/Wood	Transfer Stations King County	$75.00			Cedar Grove Composting	21,000	$1,575,000
Total						**974,421**	**$129,773,665**

Table 4.1.2 Disposal (Tip) Fee Components

	Fee per ton	Moderate risk waste surcharge	State tax
Basic Fee	**134.59**	4.73	5.02
Regional Direct	**114.00**		
Special Waste	**162.00**		5.83
Yard Waste	**75.00**		

Table 4.1.3 Funding Mechanism (see next tables)

Table 4.1.4 Tip Fee Forecast

Tip fee per ton by facility [1]	Year One (2018)	Year Three (2020)	Year Six (2023)
All Facilities	$134.59	$140.82	$154.16

[1] Basic fee

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4.2 Funding Mechanisms

Table 4.2.1 Funding Mechanism By Percentage – Year 1

Component	Tip Fee %	Grant %	Bond %	Collection Tax Rates %	Other %	Total
Waste Reduction & Recycling	99%	1%				100%
Transfer	100%					100%
Capital Projects			100%			100%
Land Disposal	100%					100%
Administration	100%					100%
Capital Debt Service	100%					100%
Other	100%					100%

Table 4.2.2 Funding Mechanism By Percentage – Year 3

Component	Tip Fee %	Grant %	Bond %	Collection Tax Rates %	Other %	Total
Waste Reduction & Recycling	99%	1%				100%
Transfer	100%					100%
Capital Projects			100%			100%
Land Disposal	100%					100%
Administration	100%					100%
Capital Debt Service	100%					100%
Other	100%					100%

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Table 4.2.3 Funding Mechanism By Percentage – Year 6

Component	Tip Fee %	Grant %	Bond %	Collection Tax Rates %	Other %	Total
Waste Reduction & Recycling	99%	1%				100%
Transfer	100%					100%
Capital Projects			100%			100%
Land Disposal	100%					100%
Administration	100%					100%
Capital Debts Service	100%					100%
Other	100%					100%

4.2 References and Assumptions

Revenue and operating cost projections for years 1, 3, and 6 are shown in Attachment 1.

4.3 Surplus Funds

The division develops its solid waste rate to maintain a 30-day emergency reserve in the operating fund. Beginning in 2019, the division will also maintain a minimum reserve balance for economic recessions equivalent to 5% of projected disposal revenue.

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Attachment 1

	2018	2020	2023
Basic Fee	135	141	154
Revenues			
Disposal Fees	130,251,197	143,923,834	170,697,073
Interest Earnings	849,809	1,030,297	879,336
Grants	118,639	120,639	102,639
Landfill Gas	3,000,000	3,000,000	2,500,000
Rental Incomes	612,208	621,338	675,097
C&D	849,543	642,669	648,192
Other Revenue	8,643,986	537,707	584,231
Moderate Risk Waste Reimb Expense	2,141,140	3,612,578	3,925,147
Low-Income Discount	-	(300,000)	(328,411)
Total Revenue	146,466,521	153,189,061	179,683,303
Operating Expenditures			
Moderate Risk Waste	2,141,140	3,612,578	3,925,147
Public Health Transfer	1,058,216	1,097,691	1,253,623
Landfill Reserve Fund	18,739,437	29,688,762	23,130,987
Capital Equipment Recovery Program	6,900,000	6,900,000	6,100,000
Construction Fund	6,000,000	2,000,000	2,000,000
Capital program debt service	13,350,000	23,267,327	27,786,035
Cedar Hills Rent	3,039,274	3,108,000	3,250,000
City mitigation	-	39,872	43,322
CHRLF Environmental Liability Policy	572,806	500,000	543,261
Fund Management	10,227,554	12,784,723	17,534,519
SW Directors Office	1,659,920	1,798,199	2,188,021
Human Resources	1,828,997	1,828,382	2,353,656
Legal Support	25,782	38,082	44,817
Customer Transactions	3,691,021	4,056,591	4,774,049
Strategy, Communications & Performance	3,263,234	3,273,757	3,884,536
Enterprise Services	3,769,015	3,720,642	4,410,987
Contract Management	1,034,931	755,109	888,660
Project Management	(29,429)	160,346	188,706
Recycling & Environmental Services	12,150,041	10,447,707	12,730,951
Facility Engineering & Science	6,374,588	5,914,155	7,829,226
Envir Monitor & Compliance	481,068	686,847	808,325
Operations Management	922,213	942,807	1,109,554
Transfer Operations	11,978,151	13,224,667	16,425,961
Transportation	10,840,311	9,914,616	11,668,137
Disposal Operations	9,079,756	7,460,202	8,913,334
LF Gas Water Control	5,456,152	4,359,666	5,130,726

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Shop Operations	6,669,010	6,482,565	7,705,582
Stores	5,967,386	5,940,957	6,991,688
B & O Tax	1,591,460	2,158,858	2,560,456
Total SWD Costs	148,782,035	166,163,110	186,174,267
under expenditure of 2% in low orgs	-	*1,740,274*	*2,030,518*
SWD cost minus under expenditure	148,782,035	164,422,836	184,143,749

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Appendix B

Six Year Capital Improvement Program

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SOLID WASTE DIVISION SIX-YEAR CAPITAL IMPROVEMENT PROGRAM

Proj. No.	Project Title	Escalated	Actuals Thru Dec 2017	2018	2019	2020	2021	2022	2023	2024	2024 Beyond
1033504	Fund 3901 Contract Audit	Current Forecast	54,213	-	-	-	-	-	-	-	-
1033504	Fund 3901 Contract Audit	2017 Adopted/2016 Cashflow Solid Waste Division	54,213	53,045	-	-	-	-	-		-
1033505	Facilities Capital Project Control Support	Current Forecast	874,570	257,500	212,180	218,545	225,102	231,855	-	-	-
1033505	Facilities Capital Project Control Support	2017 Adopted/2016 Cashflow Solid Waste Division	819,401	265,225	218,545	225,102	231,855	238,810	-		-
1033510	Landfill Reserve Contract Audit Services	Current Forecast	216,385	-	-	-	-	-	-	-	-
1033510	Landfill Reserve Contract Audit Services	2017 Adopted/2016 Cashflow Solid Waste Division	216,385	53,045	-	-	-	-	-		-
1033547	Landfill Reserve Capital Project Control Support	Current Forecast	850,111	257,500	265,225	273,182	281,377	231,855	-	-	-
1033547	Landfill Reserve Capital Project Control Support	2017 Adopted/2016 Cashflow Solid Waste Division	767,792	265,225	273,182	281,377	289,818	238,810	-		-
1133918	Facilities Relocation	Current Forecast	-	-	18,497,770	7,813,740	27,425,806	25,915,963	347,782	-	-
1133918	Facilities Relocation	2017 Adopted/2016 Cashflow Solid Waste Division	-	-	-	-	-	-	-		-
1133925	Capital Equipment	Current Forecast	-	-	9,312,242	9,312,241	6,531,385	6,531,385	6,531,385	6,531,385	-
1133925	Capital Equipment	2017 Adopted/2016 Cashflow Solid Waste Division	-	-	-	-	-	-	-		-
1033515	Cedar Hills Master Electrical PH2	Current Forecast	499,496	470,000	113,300	-	-	-	-	-	-
1033515	Cedar Hills Master Electrical PH2	2017 Adopted/2016 Cashflow Solid Waste Division	-	-	-	-	-	-	-		-
1033516	Cedar Hills Revised Site Development Plan	Current Forecast	1,844,396	183,045	883,225	697,383	109,273	-	-	-	-
1033516	Cedar Hills Revised Site Development Plan	2017 Adopted/2016 Cashflow Solid Waste Division	1,712,336	188,535	61,002	62,668	-	-	-		-
1033540	Cedar Hills Leachate Forecemain Upgrade	Current Forecast	471,204	-	-	-	-	-	-	-	-
1033540	Cedar Hills Leachate Forecemain Upgrade	2017 Adopted/2016 Cashflow Solid Waste Division	470,835	-	-	-	-	-	-		-
1033541	Cedar Hills Area 6 Closure	Current Forecast	14,654,021	-	-	-	-	-	-	-	-
1033541	Cedar Hills Area 6 Closure	2017 Adopted/2016 Cashflow Solid Waste Division	-	-	-	-	-	-	-		-

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SOLID WASTE DIVISION SIX-YEAR CAPITAL IMPROVEMENT PROGRAM

Proj. No.	Project Title	Escalated	Actuals Thru Dec 2017	2018	2019	2020	2021	2022	2023	2024	2024 Beyond
1033542	Cedar Hills Area 7 Closure	Current Forecast	14,355,815	6,732,956	2,165,631	17,081,629	579,971	-	-	-	-
1033542	Cedar Hills Area 7 Closure	2017 Adopted/2016 Cashflow Solid Waste Division	9,086,938	6,826,428	1,789,325	17,387,247	528,428	-	-		-
1033544	Cedar Hills Environmental Systems Evaluation/Implementation	Current Forecast	3,446,287	-	-	-	-	-	-	-	-
1033544	Cedar Hills Environmental Systems Evaluation/Implementation	2017 Adopted/2016 Cashflow Solid Waste Division	-	-	-	-	-	-	-		-
1033545	Cedar Hills Environmental Systems Modifications	Current Forecast	5,326,294	-	-	-	-	-	-	-	-
1033545	Cedar Hills Environmental Systems Modifications	2017 Adopted/2016 Cashflow Solid Waste Division	5,071,906	-	-	-	-	-	-		-
1112415	Cedar Hills Area 8 Closure	Current Forecast	432	-	1,524,740	6,788,042	7,269,136	7,558,874	7,567,109	5,020,520	147,462
1112415	Cedar Hills Area 8 Closure	2017 Adopted/2016 Cashflow Solid Waste Division	-	-	-	1,071,233	8,113,510	7,249,217	7,466,693		14,221,679
1115992	Area 8 Development/Facility Relocation	Current Forecast	45,824,993	22,361,347	5,120,382	-	-	-	-	-	-
1115992	Area 8 Development/Facility Relocation	2017 Adopted/2016 Cashflow Solid Waste Division	27,280,800	20,670,556	3,269,865	-	-	-	-		-
1124105	Cedar Hills Landfill Gas Pipeline Upgrade	Current Forecast	6,151,603	-	-	-	-	-	-	-	-
1124105	Cedar Hills Landfill Gas Pipeline Upgrade	2017 Adopted/2016 Cashflow Solid Waste Division	4,585,486	-	-	-	-	-	-		-
1124106	Cedar Hills Support Facilities Evaluation	Current Forecast	321,007	530,636	-	-	-	-	-	-	-
1124106	Cedar Hills Support Facilities Evaluation	2017 Adopted/2016 Cashflow Solid Waste Division	44,474	525,941	-	-	-	-	-		-
1129844	Cedar Hills Landfill Pump Station Repair	Current Forecast	61,708	600,345	2,532,176	10,609	-	-	-	-	-
1129844	Cedar Hills Landfill Pump Station Repair	2017 Adopted/2016 Cashflow Solid Waste Division	-	1,389,595	-	-	-	-	-		-
1129847	Cedar Hills Landfill North Flare Station Repair	Current Forecast	186,763	1,092,057	388,922	-	-	-	-	-	-
1129847	Cedar Hills Landfill North Flare Station Repair	2017 Adopted/2016 Cashflow Solid Waste Division	-	1,453,353	5,464	-	-	-	-		-
1129848	Cedar Hills Area 5 Top Deck	Current Forecast	-	147,192	233,805	963,275	1,242,348	5,266,586	7,376,106	9,166,858	-

SOLID WASTE DIVISION SIX-YEAR CAPITAL IMPROVEMENT PROGRAM

Proj. No.	Project Title	Escalated	Actuals Thru Dec 2017	2018	2019	2020	2021	2022	2023	2024	2024 Beyond
1129848	Cedar Hills Area 5 Top Deck	2017 Adopted/2016 Cashflow Solid Waste Division	-	151,608	240,819	992,173	1,279,618	5,424,583	7,597,389		9,441,864
1133921	Cedar Hills Landfill Leachate Lagoons	Current Forecast	-	-	3,568,950	7,463,431	-	-	-	-	-
1133921	Cedar Hills Landfill Leachate Lagoons	2017 Adopted/2016 Cashflow Solid Waste Division	-	-	-	-	-	-	-		-
1133922	Cedar Hills Landfill East Perch Zone RI-FS	Current Forecast	-	-	1,236,000	-	-	-	-	-	-
1133922	Cedar Hills Landfill East Perch Zone RI-FS	2017 Adopted/2016 Cashflow Solid Waste Division	-	-	-	-	-	-	-		-
1133923	Cedar Hills Landfill Area 9 NAD	Current Forecast	-	-	3,540,625	6,564,318	5,463,635	20,540,534	26,460,427	20,373,514	616,782
1133923	Cedar Hills Landfill Area 9 NAD	2017 Adopted/2016 Cashflow Solid Waste Division	-	-	-	-	-	-	-		-
1133924	Cedar Hills Landfill NFS Electrical	Current Forecast	-	-	2,575,000	530,450	-	-	-	-	-
1133924	Cedar Hills Landfill NFS Electrical	2017 Adopted/2016 Cashflow Solid Waste Division	-	-	-	-	-	-	-		-
1112404	Cedar Hills SCADA Master Plan-3910	Current Forecast	127,863	189,671	-	-	-	-	-	-	-
1112404	Cedar Hills SCADA Master Plan-3910	2017 Adopted/2016 Cashflow Solid Waste Division	-	-	-	-	-	-	-		-
1116833	Cedar Falls Environmental Control Systems Modifications	Current Forecast	1,982,727	400,023	923,876	621,711	-	-	-	-	-
1116833	Cedar Falls Environmental Control Systems Modifications	2017 Adopted/2016 Cashflow Solid Waste Division	1,745,590	412,024	-	-	-	-	-		-
1116838	Enumclaw Environmental Control Systems Modifications	Current Forecast	1,346,492	283,250	-	-	-	-	-	-	-
1116838	Enumclaw Environmental Control Systems Modifications	2017 Adopted/2016 Cashflow Solid Waste Division	937,760	291,747	-	-	-	-	-		-
1116840	Vashon Environmental Control Systems Modifications	Current Forecast	1,914,109	721,000	-	-	-	-	-	-	-
1116840	Vashon Environmental Control Systems Modifications	2017 Adopted/2016 Cashflow Solid Waste Division	1,679,613	742,630	-	-	-	-	-		-

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SOLID WASTE DIVISION SIX-YEAR CAPITAL IMPROVEMENT PROGRAM

Proj. No.	Project Title	Escalated	Actuals Thru Dec 2017	2018	2019	2020	2021	2022	2023	2024	2024 Beyond
1124104	Hobart Landfill Cover and Gas Control	Current Forecast	915,429	-	1,166,350	668,604	-	-	-	-	-
1124104	Hobart Landfill Cover and Gas Control	2017 Adopted/2016 Cashflow Solid Waste Division	666,343	795,675	-	-	-	-	-		-
1129849	Duvall Environmental Controls	Current Forecast	158,377	206,000	2,010,213	1,388,603	-	-	-	-	-
1129849	Duvall Environmental Controls	2017 Adopted/2016 Cashflow Solid Waste Division	-	291,747	300,500	619,030	637,601	-	-		-
1129851	Post Closure Puyallup/Kit Corner Environmental Control Systems	Current Forecast	17,324	283,250	881,292	909,250	-	-	-	-	-
1129851	Post Closure Puyallup/Kit Corner Environmental Control Systems	2017 Adopted/2016 Cashflow Solid Waste Division	-	291,747	300,500	619,030	637,601	-	-		-
1129852	Post Closure Houghton Environmental Control Systems	Current Forecast	4,744	283,250	916,101	909,251	-	-	-	-	-
1129852	Post Closure Houghton Environmental Control System	2017 Adopted/2016 Cashflow Solid Waste Division	-	291,747	300,500	619,030	637,601	-	-		-
1033497	South County Recycling and Transfer Station	Current Forecast	6,933,050	4,183,959	9,171,462	18,254,809	41,226,926	44,376,428	8,072,568	724,605	119,415
1033497	South County Recycling and Transfer Station	2017 Adopted/2016 Cashflow Solid Waste Division	6,666,042	6,275,223	6,441,625	34,153,562	36,260,929	19,583,649	821,556		-
1033498	Northeast Recycling and Transfer Station	Current Forecast	884,435	-	1,532,003	38,690,949	1,479,707	4,317,692	5,155,631	6,098,230	109,307,140
1033498	Northeast Recycling and Transfer Station	2017 Adopted/2016 Cashflow Solid Waste Division	-	-	-	-	-	-	-		-
1033503	Harbor Island Safety Improvements	Current Forecast	2,639,599	-	(720,910)	-	-	-	-	-	-
1033503	Harbor Island Safety Improvements	2017 Adopted/2016 Cashflow Solid Waste Division	2,503,495	-	-	-	-	-	-		-
1033506	Bow Lake Recycling and Transfer Station	Current Forecast	88,158,348	-	25,750	-	-	-	-	-	-
1033506	Bow Lake Recycling and Transfer Station	2017 Adopted/2016 Cashflow Solid Waste Division	88,253,335	-	-	-	-	-	-		-
1048385	Factoria Recycling and Transfer Station	Current Forecast	90,434,755	829,045	186,202	-	-	-	-	-	-

SOLID WASTE DIVISION SIX-YEAR CAPITAL IMPROVEMENT PROGRAM

Proj. No.	Project Title	Escalated	Actuals Thru Dec 2017	2018	2019	2020	2021	2022	2023	2024	2024 Beyond
1048385	Factoria Recycling and Transfer Station	2017 Adopted/2016 Cashflow Solid Waste Division	82,208,424	833,591	188,657	-	-	-	-		-
1112396	Transfer Station SCADA Master Plan - 3901	Current Forecast	23,657	87,272	-	-	-	-	-	-	-
1112396	Transfer Station SCADA Master Plan - 3901	2017 Adopted/2016 Cashflow Solid Waste Division	-	-	-	-	-	-	-		-
1115975	Cedar Falls Drop Box Improvement	Current Forecast	37,066	862,444	14,662	-	-	-	-	-	-
1115975	Cedar Falls Drop Box Improvement	2017 Adopted/2016 Cashflow Solid Waste Division	9,363	588,686	-	-	-	-	-		-
1124107	Algona Transfer Station Deconstruction	Current Forecast	-	-	-	21,961	288,411	1,765,171	33,433	-	-
1124107	Algona Transfer Station Deconstruction	2017 Adopted/2016 Cashflow Solid Waste Division	-	-	-	22,620	297,064	1,818,127	34,436		-
1129850	Harbor Island Dock Demolition	Current Forecast	6,491	221,000	650,833	747,934	2,006,418	-	-	-	-
1129850	Harbor Island Dock Demolition	2017 Adopted/2016 Cashflow Solid Waste Division	-	1,831,154	1,381,494	-	-	-	-		-
1033507	Construction CIP Oversight	Current Forecast	105,200	3,000	40,170	44,558	17,484	15,757	10,433	3,582	-
1033507	Construction CIP Oversight	2017 Adopted/2016 Cashflow Solid Waste Division	104,245	3,153	-	-	-	-	-		-
1033548	Landfill Reserve CIP Oversight	Current Forecast	54,955	12,000	12,360	12,731	13,113	13,506	13,911	14,329	-
1033548	Landfill Reserve CIP Oversight	2017 Adopted/2016 Cashflow Solid Waste Division	45,846	23,421	-	-	-	-	-		-
1033485	CERP Capital Repairs	Current Forecast	12,524,751	1,950,000	-	-	-	-	-	-	-
1033485	CERP Capital Repairs	2017 Adopted/2016 Cashflow Solid Waste Division	12,263,886	1,699,999	1,699,999	1,700,001	1,699,999	1,700,001	-		-
1033487	CERP Equipment Replacement Purchase	Current Forecast	92,077,706	7,000,000	-	-	-	-	-	-	-
1033487	CERP Equipment Replacement Purchase	2017 Adopted/2016 Cashflow Solid Waste Division	86,223,926	8,692,500	7,644,500	7,644,500	4,751,424	4,751,426	-		-
		Current Forecast	395,486,377	50,147,741	68,980,534	119,987,207	94,160,092	116,765,606	61,568,786	47,933,022	110,190,798
		2017 Adopted/2016 Cashflow Solid Waste Division	333,418,436	54,907,601	24,115,976	65,397,572	55,365,447	41,004,622	15,920,074	-	23,663,543

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Appendix C

Amended and Restated Solid Waste Interlocal Agreement

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AMENDED AND RESTATED SOLID WASTE INTERLOCAL AGREEMENT

This Amended and Restated Solid Waste Interlocal Agreement ("Agreement") is entered into between King County, a political subdivision of the State of Washington and the City of ___ _____, a municipal corporation of the State of Washington, hereinafter referred to as "County" and "City" respectively. Collectively, the County and the City are referred to as the "Parties." This Agreement has been authorized by the legislative body of each jurisdiction pursuant to formal action as designated below:

King County: Ordinance No._____

City: _____

PREAMBLE

A. This Agreement is entered into pursuant to chapter 39.34 RCW for the purpose of extending, restating and amending the Solid Waste Interlocal Agreement between the Parties originally entered into in ____ (the "Original Agreement"). The Original Agreement provided for the cooperative management of Solid Waste in King County for a term of forty (40) years, through June 30, 2028. The Original Agreement is superseded by this Amended and Restated Agreement, as of the effective date of this Agreement. This Amended and Restated Agreement is effective for an additional twelve (12) years through December 31, 2040.

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B. The Parties intend to continue to cooperatively manage Solid Waste and to work collaboratively to maintain and periodically update the existing King County Comprehensive Solid Waste Management Plan (Comprehensive Plan) adopted pursuant to chapter 70.95 RCW.

C. The Parties continue to support the established goals of Waste Prevention and Recycling as incorporated in the Comprehensive Solid Waste Management Plan, and to meet or surpass applicable environmental standards with regard to the Solid Waste System.

D. The County and the Cities agree that System-related costs, including environmental liabilities, should be funded by System revenues which include but are not limited to insurance proceeds, grants and rates;

E. The County, as the service provider, is in the best position to steward funds System revenues that the County and the Cities intend to be available to pay for environmental liabilities; and

F. The County and the Cities recognize that at the time this Agreement goes into effect, it is impossible to know what the ultimate environmental liabilities could be; nevertheless, the County and the Cities wish to designate in this Agreement a protocol for the designation and distribution of funding for potential future environmental liabilities in order to protect the general funds of the County and the Cities.

G. The County began renting the Cedar Hills Landfill from the State of Washington in 1960 and began using it for Disposal of Solid Waste in 1964. The County acquired ownership of the Cedar Hills Landfill from the State in 1992. The Cedar Hills Landfill remains an asset owned by the County.

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H. The Parties expect that the Cedar Hills Landfill will be at capacity and closed at some date during the term of this Agreement, after which time all Solid Waste under this Agreement will need to be disposed of through alternate means, as determined by the Cities and the County through amendments to the Comprehensive Solid Waste Management Plan. The County currently estimates the useful life of the Cedar Hills Landfill will extend through 2025. It is possible that this useful life could be extended, or shortened, by System management decisions or factors beyond the control of the Parties.

I. The County intends to charge rent for the use of the Cedar Hills Landfill for so long as the System uses this general fund asset and the Parties seek to clarify terms relative to the calculation of the associated rent.

J. The County and Cities participating in the System have worked collaboratively for several years to develop a plan for the replacement or upgrading of a series of transfer stations. The Parties acknowledge that these transfer station improvements, as they may be modified from time-to-time, will benefit Cities that are part of the System and the County. The Parties have determined that the extension of the term of the Original Agreement by twelve (12) years as accomplished by this Agreement is appropriate in order to facilitate the long-term financing of transfer station improvements and to mitigate rate impacts of such financing.

K. The Parties have further determined that in order to equitably allocate the benefit to all System Users from the transfer station improvements, different customer classes may be established by the County to ensure System Users do not pay a disproportionate share of the cost of these improvements as a result of a decision by a city not to extend the term of the Original Agreement.

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L. The Parties have further determined it is appropriate to strengthen and formalize the advisory role of the Cities regarding System operations.

The Parties agree as follows:

I. DEFINITIONS

For purposes of this Agreement the following definitions shall apply:

"Cedar Hills Landfill" means the landfill owned and operated by the County located in southeast King County.

"Cities" refers to all Cities that have signed an Amended and Restated Solid Waste Interlocal Agreement in substantially identical form to this Agreement.

"Comprehensive Solid Waste Management Plan" or "Comprehensive Plan" means the Comprehensive Solid Waste Management Plan, as approved and amended from time to time, for the System, as required by chapter 70.95.080 RCW.

"County" means King County, a Charter County and political subdivision of the State of Washington.

"Disposal" means the final treatment, utilization, processing, deposition, or incineration of Solid Waste but shall not include Waste Prevention or Recycling as defined herein.

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"Disposal Rates" means the fee charged by the County to System Users to cover all costs of the System consistent with this Agreement, all state, federal and local laws governing solid waste and the Solid Waste Comprehensive Plan.

"Divert" means to direct or permit the directing of Solid Waste to Disposal sites other than the Disposal site(s) designated by King County.

"Energy/Resource Recovery" means the recovery of energy in a usable form from mass burning or refuse-derived fuel incineration, pyrolysis or any other means of using the heat of combustion of Solid Waste that involves high temperature (above 1,200 degrees F) processing. (chapter 173.350.100 WAC).

"Landfill" means a Disposal facility or part of a facility at which Solid Waste is placed in or on land and which is not a land treatment facility.

"Metropolitan Solid Waste Advisory Committee" or "MSWAC" means the advisory committee composed of city representatives, established pursuant to Section IX of this Agreement.

"Moderate Risk Waste" means waste that is limited to conditionally exempt small quantity generator waste and household hazardous waste as those terms are defined in chapter 173-350 WAC, as amended.

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"Original Agreement" means the Solid Waste Interlocal Agreement first entered into by and between the Parties, which is amended and restated by this Agreement. "Original Agreements" means collectively all such agreements between Cities and the County in substantially the same form as the Original Agreement.

"Parties" means collectively the County and the City or Cities.

"Recycling" as defined in chapter 70.95.030 RCW, as amended, means transforming or remanufacturing waste materials into usable or marketable materials for use other than landfill Disposal or incineration.

"Regional Policy Committee" means the Regional Policy Committee created pursuant to approval of the County voters in 1993, the composition and responsibilities of which are prescribed in King County Charter Section 270 and chapter 1.24 King County Code, as they now exist or hereafter may be amended.

"Solid Waste" means all putrescible and nonputrescible solid and semisolid wastes including but not limited to garbage, rubbish, ashes, industrial wastes, swill, commercial waste, sewage sludge, demolition and construction wastes, abandoned vehicles or parts thereof, contaminated soils and contaminated dredged materials, discarded commodities and recyclable materials, but shall not include dangerous, hazardous, or extremely hazardous waste as those terms are defined in chapter 173-303 WAC, as amended; and shall further not include those

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wastes excluded from the regulations established in chapter 173-350 WAC, more specifically identified in Section 173-350-020 WAC.

"Solid Waste Advisory Committee" or "SWAC" means the inter-disciplinary advisory forum or its successor created by the King County Code pursuant to chapter 70.95.165 RCW.

"System" includes King County's Solid Waste facilities used to manage Solid Wastes which includes but is not limited to transfer stations, drop boxes, landfills, recycling systems and facilities, energy and resource recovery facilities and processing facilities as authorized by chapter 36.58.040 RCW and as established pursuant to the approved King County Comprehensive Solid Waste Management Plan.

"System User" or "System Users" means Cities and any person utilizing the County's System for Solid Waste handling, Recycling or Disposal.

"Waste Prevention" means reducing the amount or type of waste generated. Waste Prevention shall not include reduction of already-generated waste through energy recovery, incineration, or otherwise.

II. PURPOSE

The purpose of this Agreement is to foster transparency and cooperation between the Parties and to establish the respective responsibilities of the Parties in a Solid Waste management System, including but not limited to, planning, Waste Prevention, Recycling, and Disposal. .

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III. DURATION

This Agreement shall become effective as of _____, and shall remain in effect through December 31, 2040.

IV. APPROVAL

This Agreement will be approved and filed in accordance with chapter 39.34 RCW.

V. RENEGOTIATION TO FURTHER EXTEND TERM OF AGREEMENT

5.1 The Parties recognize that System Users benefit from long-term Disposal arrangements, both in terms of predictability of System costs and operations, and the likelihood that more cost competitive rates can be achieved with longer-term Disposal contracts as compared to shorter-term contracts. To that end, at least seven (7) years before the date that the County projects that the Cedar Hills Landfill will close, or prior to the end of this Agreement, whichever is sooner, the County will engage with MSWAC and the Solid Waste Advisory Committee, among others, to seek their advice and input on the Disposal alternatives to be used after closure of the Cedar Hills Landfill, associated changes to the System, estimated costs associated with the recommended Disposal alternatives, and amendments to the Comprehensive Solid Waste Management Plan necessary to support these changes. Concurrently, the Parties will meet to negotiate an extension of the term of the Agreement for the purpose of facilitating the long-term Disposal of Solid Waste after closure of the Cedar Hills Landfill. Nothing in this Agreement shall require the Parties to reach agreement on an extension of the term of this Agreement. If the Parties fail to reach agreement on an extension, the Dispute Resolution provisions of Section XIII do not apply, and this Agreement shall remain unchanged.

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5.2 Notwithstanding any other provision in this Agreement to the contrary, the Parties may, pursuant to mutual written agreement, modify or amend any provision of this Agreement at any time during the term of said Agreement.

VI. GENERAL OBLIGATIONS OF PARTIES

6.1 King County

6.1.a Management. The County agrees to provide Solid Waste management services, as specified in this Section, for Solid Waste generated and collected within the City, except waste eliminated through Waste Prevention or waste recycling activities. The County agrees to dispose of or designate Disposal sites for all Solid Waste and Moderate Risk Waste generated and/or collected within the corporate limits of the City which is delivered to the System in accordance with all applicable Federal, State and local environmental health laws, rules, or regulations, as those laws are described in Subsection 8.5.a. The County shall maintain records as necessary to fulfill obligations under this Agreement.

6.1.b Planning. The County shall serve as the planning authority for Solid Waste and Moderate Risk Waste under this Agreement but shall not be responsible for planning for any other waste or have any other planning responsibility under this Agreement.

6.1.c Operation. King County shall be or shall designate or authorize the operating authority for transfer, processing and Disposal facilities, including public landfills and other facilities, consistent with the adopted Comprehensive Plan as well as closure and post-closure responsibilities for landfills which are or were operated by the County.

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6.1.d Collection Service. The County shall not provide Solid Waste collection services within the corporate limits of the City, unless permitted by law and agreed to by both Parties.

6.1.e Support and Assistance. The County shall provide support and technical assistance to the City consistent with the Comprehensive Solid Waste Management Plan for a Waste Prevention and Recycling program. Such support may include the award of grants to support programs with System benefits. The County shall develop educational materials related to Waste Prevention and Recycling and strategies for maximizing the usefulness of the educational materials and will make these available to the City for its use. Although the County will not be required to provide a particular level of support or fund any City activities related to Waste Prevention and Recycling, the County intends to move forward aggressively to promote Waste Prevention and Recycling.

6.1.f Forecast. The County shall develop Solid Waste stream forecasts in connection with System operations as part of the comprehensive planning process in accordance with Article XI.

6.1.g Facilities and Services. The County shall provide facilities and services pursuant to the Comprehensive Solid Waste Management Plan and the Solid Waste Transfer and Waste Management plan as adopted and County Solid Waste stream forecasts.

6.1.h Financial Policies. The County will maintain financial policies to guide the System's operations and investments. The policies shall be consistent with this Agreement and shall address debt issuance, rate stabilization, cost containment, reserves, asset ownership and use, and other financial issues. The County shall primarily use long term bonds to finance transfer System improvements. The policies shall be developed and/or revised through

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discussion with MSWAC, the Regional Policy Committee, the County Executive and the County Council. Such policies shall be codified at the same time as the Comprehensive Plan updates, but may be adopted from time to time as appropriate outside the Comprehensive Plan process.

6.2 City

6.2.a Collection. The City, an entity designated by the City or such other entity as is authorized by state law shall serve as operating authority for Solid Waste collection services provided within the City's corporate limits.

6.2.b Disposal. The City shall cause to be delivered to the County's System for Disposal all such Solid Waste and Moderate Risk Waste which is authorized to be delivered to the System in accordance with all applicable Federal, State and local environmental health laws, rules or regulations and is generated and/or collected within the corporate limits of the City and shall authorize the County to designate Disposal sites for the Disposal of all such Solid Waste and Moderate Risk Waste generated or collected within the corporate limits of the City, except for Solid Waste which is eliminated through Waste Prevention or waste Recycling activities consistent with the Comprehensive Solid Waste Management Plan. No Solid Waste generated or collected within the City may be Diverted from the designated Disposal sites without County approval.

6.3 JOINT RESPONSIBILITIES.

6.3.a Consistent with the Parties' overall commitment to ongoing communication and coordination, the Parties will endeavor to notify and coordinate with each other on the development of any City or County plan, facility, contract, dispute, or other Solid Waste issue that could have potential significant impacts on the County, the System, or the City or Cities.

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6.3.b The Parties, together with other Cities, will coordinate on the development of emergency plans related to Solid Waste, including but not limited to debris management.

VII. COUNTY SHALL SET DISPOSAL RATES AND OPERATING RULES FOR DISPOSAL; USE OF SYSTEM REVENUES

7.1 In establishing Disposal Rates for System Users, the County shall consult with MSWAC consistent with Section IX. The County may adopt and amend by ordinance rates necessary to recover all costs of the System including but not limited to operations and maintenance, costs for handling, processing and Disposal of Solid Waste, siting, design and construction of facility upgrades or new facilities, Recycling, education and mitigation, planning, Waste Prevention, reserve funds, financing, defense and payment of claims, insurance, System liabilities including environmental releases, monitoring and closure of landfills which are or were operated by the County, property acquisition, grants to cities, and administrative functions necessary to support the System and Solid Waste handling services during emergencies as established by local, state and federal agencies or for any other lawful solid waste purpose, and in accordance with chapter 43.09.210 RCW. Revenues from Disposal rates shall be used only for such purposes. The County shall establish classes of customers for Solid Waste management services and by ordinance shall establish rates for classes of customers.

7.2. It is understood and agreed that System costs include payments to the County general fund for Disposal of Solid Waste at the Cedar Hills Landfill calculated in accordance with this Section 7.2, and that such rental payments shall be established based on use valuations provided to the County by an independent-third party Member, Appraisal Institute (MAI) certified appraiser selected by the County in consultation with MSWAC.

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7.2.a A use valuation shall be prepared consistent with MAI accepted principles for the purpose of quantifying the value to the System of the use of Cedar Hills Landfill for Disposal of Solid Waste over a specified period of time (the valuation period). The County shall establish a schedule of annual use charges for the System's use of the Cedar Hills Landfill which shall not exceed the most recent use valuation. Prior to establishing the schedule of annual use charges, the County shall seek review and comment as to both the use valuation and the proposed payment schedule from MSWAC. Upon request, the County will share with and explain to MSWAC the information the appraiser requests for purposes of developing the appraiser's recommendation.

7.2.b Use valuations and the underlying schedule of use charges shall be updated if there are significant changes in Cedar Hills Landfill capacity as a result of opening new Disposal areas and as determined by revisions to the existing Cedar Hills Regional Landfill Site Development Plan; in that event, an updated appraisal will be performed in compliance with MAI accepted principles. Otherwise, a reappraisal will not occur. Assuming a revision in the schedule of use charges occurs based on a revised appraisal, the resulting use charges shall be applied beginning in the subsequent rate period.

7.2.c The County general fund shall not charge use fees or receive other consideration from the System for the System's use of any transfer station property in use as of the effective date of this Agreement. The County further agrees that the County general fund may not receive payments from the System for use of assets to the extent those assets are acquired with System revenues. As required by chapter 43.09.210 RCW, the System's use of assets acquired with the use of other separate County funds (e.g., the Roads Fund, or other funds)

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will be subject to use charges; similarly, the System will charge other County funds for use of System property.

VIII. LIABILITY

8.1 Non-Environmental Liability Arising Out-of-County Operations. Except as provided in this Section, Sections 8.5 and 8.6, the County shall indemnify and hold harmless the City and shall have the right and duty to defend the City through the County's attorneys against any and all claims arising out of the County's operations during the term of this Agreement and settle such claims, provided that all fees, costs, and expenses incurred by the County thereby are System costs which may be satisfied from Disposal Rates as provided in Section VII herein. In providing such defense of the City, the County shall exercise good faith in such defense or settlement so as to protect the City's interest. For purposes of this Section "claims arising out of the County's operations" shall mean claims arising out of the ownership, control, or maintenance of the System, but shall not include claims arising out of the City's operation of motor vehicles in connection with the System or other activities under the control of the City which may be incidental to the County's operation. The provisions of this Section shall not apply to claims arising out of the sole negligence or intentional acts of the City. The provisions of this Section shall survive for claims brought within three (3) years past the term of this Agreement established under Section III.

8.2 Cooperation. In the event the County acts to defend the City against a claim under Section 8.1, the City shall cooperate with the County.

8.3 Officers, Agents, and Employees. For purposes of this Section VIII, references to City or County shall be deemed to include the officers, employees and agents of either Party,

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acting within the scope of their authority. Transporters or generators of waste who are not officers or employees of the City or County are not included as agents of the City or County for purposes of this Section.

8.4 Each Party by mutual negotiation hereby waives, with respect to the other Party only, any immunity that would otherwise be available against such claims under the Industrial Insurance provisions of Title 51 RCW.

8.5 Unacceptable Waste

8.5.a All waste generated or collected from within the corporate limits of the City which is delivered to the System for Disposal shall be in compliance with the Resource Conservation and Recovery Act (42 U.S.C. § 6901 et seq.) (RCRA), chapters 70.95 and 70.105 RCW, King County Code Title 10, King County Board of Health Rules and Regulations, the Solid Waste Division operating rules, and all other Federal, State and local environmental health laws, rules or regulations that impose restrictions or requirements on the type of waste that may be delivered to the System, as they now exist or are hereafter adopted or amended.

8.5.b For purposes of this Agreement, the City shall be deemed to have complied with the requirements of Subsection 8.5.a if it has adopted an ordinance requiring waste delivered to the System for Disposal to meet the laws, rules, or regulations specified in Subsection 8.5.a. However, nothing in this Agreement is intended to relieve the City from any obligation or liability it may have under the laws mentioned in Subsection 8.5.a arising out of the City's actions other than adopting, enforcing, or requiring compliance with said ordinance, such as liability, if any exists, of the City as a transporter or generator for improper transport or Disposal of regulated dangerous waste. Any environmental liability the City may have for

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releases of pollutants or hazardous or dangerous substances or wastes to the environment is dealt with under Sections 8.6 and 8.7.

8.5.c The City shall hold harmless, indemnify and defend the County for any property damages or personal injury caused solely by the City's failure to adopt an ordinance under Subsection 8.5.b. In the event the City acts to defend the County under this Subsection, the County shall cooperate with the City.

8.5.d The City shall make best efforts to include language in its contracts, franchise agreements, or licenses for the collection of Solid Waste within the City that allow for enforcement by the City against the collection contractor, franchisee or licensee for violations of the laws, rules, or regulations in Subsection 8.5.a. The requirements of this Subsection 8.5.d shall apply to the City's first collection contract, franchise, or license that becomes effective or is amended after the effective date of this Agreement.

8.5.d.i If waste is delivered to the System in violation of the laws, rules, or regulations in Subsection 8.5.a, before requiring the City to take any action under Subsection 8.5.d.ii, the County will make reasonable efforts to determine the parties' responsible for the violation and will work with those parties to correct the violation, consistent with applicable waste clearance and acceptance rules, permit obligations, and any other legal requirements.

8.5.d.ii If the violation is not corrected under Subsection 8.5.d.i and waste is determined by the County to have been generated or collected from within the corporate limits of the City, the County shall provide the City with written notice of the violation. Upon such notice, the City shall take immediate steps to remedy the violation and prevent similar future violations to the reasonable satisfaction of the County which may include but not be

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limited to removing the waste and disposing of it in an approved facility; provided that nothing in this Subsection 8.5.d.ii shall obligate the City to handle regulated dangerous waste, as defined in WAC 173-351-200(1)(b)(i), and nothing in this Subsection shall relieve the City of any obligation it may have apart from this Agreement to handle regulated dangerous waste. If, in good faith, the City disagrees with the County regarding the violation, such dispute shall be resolved between the Parties using the Dispute Resolution process in Section XII or, if immediate action is required to avoid an imminent threat to public health, safety or the environment, in King County Superior Court. Each Party shall be responsible for its own attorneys' fees and costs. Failure of the City to take the steps requested by the County pending Superior Court resolution shall not be deemed a violation of this Agreement; provided, however, that this shall not release the City for damages or loss to the County arising out of the failure to take such steps if the Court finds a City violation of the requirements to comply with applicable laws set forth in Subsection 8.5.a.

8.6 Environmental Liability.

8.6.a Neither the County nor the City holds harmless or indemnifies the other with regard to any liability arising under 42 U.S.C. § 9601-9675 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) or as hereafter amended or pursuant to chapter 70.105D RCW (MTCA) or as hereafter amended and any state legislation imposing liability for System-related cleanup of contaminated property from the release of pollutants or hazardous or dangerous substances and/or damages resulting from property contaminated from the release of pollutants or hazardous or dangerous substances ("Environmental Liabilities").

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8.6.b Nothing in this Agreement is intended to create new Environmental Liability nor release any third-party from Environmental Liability. Rather, the intent is to protect the general funds of the Parties to this Agreement by ensuring that, consistent with best business practices, an adequate portion of Disposal Rates being collected from the System Users are set aside and accessible in a fair and equitable manner to pay the respective County and City's Environmental Liabilities.

8.6.c The purpose of this Subsection is to establish a protocol for the setting aside, and subsequent distribution of, Disposal Rates intended to pay for Environmental Liabilities of the Parties, if and when such liabilities should arise, in order to safeguard the Parties' general funds. To do so, the County shall:

8.6.c.i Use Disposal Rates to obtain and maintain, to the extent commercially available under reasonable terms, insurance coverage for System-related Environmental Liability that names the City as an Additional Insured. The County shall establish the adequacy, amount and availability of such insurance in consultation with MSWAC. Any insurance policy in effect on the termination date of this Agreement with a term that extends past the termination date shall be maintained until the end of the policy term.

8.6.c.ii Use Disposal Rates to establish and maintain a reserve fund to help pay the Parties' Environmental Liabilities not already covered by System rates or insurance maintained under Subsection 8.6.c.i above ("Environmental Reserve Fund"). The County shall establish the adequacy of the Environmental Reserve Fund in consultation with MSWAC and consistent with the financial policies described in Article VI. The County shall retain the Environmental Reserve Fund for a minimum of 30 years following the closure of the Cedar Hills Landfill (the "Retention Period"). During the Retention Period, the Environmental Reserve Fund

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shall be used solely for the purposes for which it was established under this Agreement. Unless otherwise required by law, at the end of the Retention Period, the County and Cities shall agree as to the disbursement of any amounts remaining in the Environmental Reserve Fund. If unable to agree, the County and City agree to submit disbursement to mediation and if unsuccessful to binding arbitration in a manner similar to Section 39.34.180 RCW to the extent permitted by law.

8.6.c.iii Pursue state or federal grant funds, such as grants from the Local Model Toxics Control Account under chapter 70.105D.070(3) RCW and chapter 173-322 WAC, or other state or federal funds as may be available and appropriate to pay for or remediate such Environmental Liabilities.

8.6.d If the funds available under Subsections 8.6.c.i-iii are not adequate to completely satisfy the Environmental Liabilities of the Parties to this Agreement then to the extent feasible and permitted by law, the County will establish a financial plan including a rate schedule to help pay for the County and City's remaining Environmental Liabilities in consultation with MSWAC.

8.6.e The County and the City shall act reasonably and quickly to utilize funds collected or set aside through the means specified in Subsections 8.6.c.i-iii and 8.6.d to conduct or finance response or clean-up activities in order to limit the County and City's exposure, or in order to comply with a consent decree, administrative or other legal order. The County shall notify the City within 30 days of any use of the reserve fund established in 8.6.c.iii.

8.6.f In any federal or state regulatory proceeding, and in any action for contribution, money expended by the County from the funds established in Subsections 8.6.c.i-iii and 8.6.d. to pay the costs of remedial investigation, cleanup, response or other action required

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pursuant to a state or federal laws or regulations shall be considered by the Parties to have been expended on behalf and for the benefit of the County and the Cities.

8.6.g In the event that the funds established as specified in Subsections 8.6.c.i-iii and 8.6.d are insufficient to cover the entirety of the County and Cities' collective Environmental Liabilities, the funds described therein shall be equitably allocated between the County and Cities to satisfy their Environmental Liabilities. Factors to be considered in determining "equitably allocated" may include the size of each Party's System User base and the amount of rates paid by that System User base into the funds, and the amount of the Solid Waste generated by the Parties' respective System Users. Neither the County nor the Cities shall receive a benefit exceeding their Environmental Liabilities.

8.7 The County shall not charge or seek to recover from the City any costs or expenses for which the County indemnified the State of Washington in Exhibit A to the Quitclaim Deed from the State to the County for the Cedar Hills Landfill, dated February 24, 1993, to the extent such costs are not included in System costs.

IX. CITY ADVISORY COMMITTEE

9.1 There is hereby created an advisory committee comprised of representatives from cities, which shall be known as the Metropolitan Solid Waste Advisory Committee ("MSWAC"). The City may designate a representative and alternate(s) to serve on MSWAC. MSWAC shall elect a chair and vice-chair and shall adopt bylaws to guide its deliberations. The members of MSWAC shall serve at the pleasure of their appointing bodies and shall receive no compensation from the County.

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9.2 MSWAC is the forum through which the Parties together with other cities participating in the System intend to discuss and seek to resolve System issues and concerns. MSWAC shall assume the following advisory responsibilities:

9.2.a Advise the King County Council, the King County Executive, Solid Waste Advisory Committee, and other jurisdictions as appropriate, on all policy aspects of Solid Waste management and planning;

9.2.b Consult with and advise the County on technical issues related to Solid Waste management and planning;

9.2.c Assist in the development of alternatives and recommendations for the Comprehensive Solid Waste Management Plan and other plans governing the future of the System, and facilitate a review and/or approval of the Comprehensive Solid Waste Management Plan by each jurisdiction;

9.2.d Assist in the development of proposed interlocal Agreements between King County and cities for planning, Waste Prevention and Recycling, and waste stream control;

9.2.e Review and comment on Disposal Rate proposals and County financial policies;

9.2.f Review and comment on status reports on Waste Prevention, Recycling, energy/resources recovery, and System operations with inter-jurisdictional impact;

9.2.g Promote information exchange and interaction between waste generators, cities, recyclers, and the County with respect to its planned and operated Disposal Systems;

9.2.h Provide coordination opportunities among the Solid Waste Advisory Committee, the Regional Policy Committee, the County, cities, private waste haulers, and recyclers;

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9.2.i Assist cities in recognizing municipal Solid Waste responsibilities, including collection and Recycling, and effectively carrying out those responsibilities; and

9.2.j Provide input on such disputes as MSWAC deems appropriate.

9.3 The County shall assume the following responsibilities with respect to MSWAC;

9.3.a The County shall provide staff support to MSWAC;

9.3.b In consultation with the chair of MSWAC, the County shall notify all cities and their designated MSWAC representatives and alternates of the MSWAC meeting times, locations and meeting agendas. Notification by electronic mail or regular mail shall meet the requirements of this Subsection;

9.3.c The County will consider and respond on a timely basis to questions and issues posed by MSWAC regarding the System, and will seek to resolve those issues in collaboration with the Cities. Such issues shall include but are not limited to development of efficient and accountable billing practices; and

9.3.d. The County shall provide all information and supporting documentation and analyses as reasonably requested by MSWAC for MSWAC to perform the duties and functions described in Section 9.2.

X. FORUM INTERLOCAL AGREEMENT

10.1 As of the effective date of this Agreement, the *Forum Interlocal Agreement* and *Addendum to* Solid Waste Interlocal Agreement *and Forum Interlocal Agreement* by and between the City and County continue through June 30, 2028. After 2028 responsibilities assigned to the Forum shall be assigned to the Regional Policy Committee. The Parties agree that Solid Waste System policies and plans shall continue to be deemed regional countywide policies

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and plans that shall be referred to the Regional Policy Committee for review consistent with King County Charter Section 270.30 and chapter 1.24 King County Code.

XI. COMPREHENSIVE SOLID WASTE MANAGEMENT PLAN

11.1 King County is designated to prepare the Comprehensive Solid Waste Management Plan (Comprehensive Plan) and this plan shall include the City's Solid Waste Management Comprehensive Plan pursuant to chapter 70.95.080(3) RCW.

11.2 The Comprehensive Plan shall be reviewed and any necessary revisions proposed. The County shall consult with MSWAC to determine when revisions are necessary. King County shall provide services and build facilities in accordance with the adopted Comprehensive Plan.

11.3 The Comprehensive Plans will promote Waste Prevention and Recycling in accordance with Washington State Solid Waste management priorities pursuant to chapter 70.95 RCW, at a minimum.

11.4 The Comprehensive Plans will be prepared in accordance with chapter 70.95 RCW and Solid Waste planning guidelines developed by the Department of Ecology. The plan shall include, but not be limited to:

11.4.a Descriptions of and policies regarding management practices and facilities required for handling all waste types;

11.4.b Schedules and responsibilities for implementing policies;

11.4.c Policies concerning waste reduction, Recycling, Energy and Resource Recovery, collection, transfer, long-haul transport, Disposal, enforcement and administration; and

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11.4.d Operational plan for the elements discussed in Item c above.

11.5 The cost of preparation by King County of the Comprehensive Plan will be considered a cost of the System and financed out of the rate base.

11.6 The Comprehensive Plans will be "adopted" within the meaning of this Agreement when the following has occurred:

11.6.a The Comprehensive Plan is approved by the King County Council; and

11.6.b The Comprehensive Plan is approved by cities representing three-quarters of the population of the incorporated population of jurisdictions that are parties to the Forum Interlocal Agreement. In calculating the three-quarters, the calculations shall consider only those incorporated jurisdictions taking formal action to approve or disapprove the Comprehensive Plan within 120 days of receipt of the Plan. The 120-day time period shall begin to run from receipt by an incorporated jurisdiction of the Forum's recommendation on the Comprehensive Plan, or, if the Forum is unable to make a recommendation, upon receipt of the Comprehensive Plan from the Forum without recommendation.

11.7 Should the Comprehensive Plan be approved by the King County Council, but not receive approval of three-quarters of the cities acting on the Comprehensive Plan, and should King County and the cities be unable to resolve their disagreement, then the Comprehensive Plan shall be referred to the State Department of Ecology and the State Department of Ecology will resolve any disputes regarding Comprehensive Plan adoption and adequacy by approving or disapproving the Comprehensive Plan or any part thereof.

11.8 King County shall determine which cities are affected by any proposed amendment to the Comprehensive Plan. If any City disagrees with such determination, then the City can request that the Forum determine whether or not the City is affected. Such

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determination shall be made by a two-thirds majority vote of all representative members of the Forum.

11.9 Should King County and the affected jurisdictions be unable to agree on amendments to the Comprehensive Plan, then the proposed amendments shall be referred to the Department of Ecology to resolve any disputes regarding such amendments.

11.10 Should there be any impasse between the Parties regarding Comprehensive Plan adoption, adequacy, or consistency or inconsistency or whether any permits or programs adopted or proposed are consistent with the Comprehensive Plan, then the Department of Ecology shall resolve said disputes.

XII. MITIGATION

12.1 The County will design, construct and operate Solid Waste facilities in a manner to mitigate their impact on host Cities and neighboring communities pursuant to applicable law and regulations.

12.2 The Parties recognize that Solid Waste facilities are regional facilities. The County further recognizes that host Cities and neighboring communities may sustain impacts which can include but are not limited to local infrastructure, odor, traffic into and out of Solid Waste facilities, noise and litter.

12.3 Collaboration in Environmental Review. In the event the County is the sole or co-Lead Agency, then prior to making a threshold determination under the State Environmental Policy Act (SEPA), the County will provide a copy of the SEPA environmental checklist, if any, and proposed SEPA threshold determination to any identifiable Host City (as defined below) and adjacent or neighboring city that is signatory to the Agreement and that may be affected by the

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project ("Neighboring City") and seek their input. For any facility for which the County prepares an Environmental Impact Statement (EIS), the County will meet with any identified potential Host City (as defined below) and any Neighboring City to seek input on the scope of the EIS and appropriate methodologies and assumptions in preparing the analyses supporting the EIS. However, nothing in this Section shall limit or impair the County's ability to timely complete the environmental review process.

12.4 Collaboration in Project Permitting. If a new or reconstructed Solid Waste facility is proposed to be built within the boundaries of the City ("Host City") and the project requires one or more "project permits" as defined in chapter 36.70B.020(4) RCW from the Host City, before submitting its first application for any of the project permits, the County will meet with the Host City and any Neighboring City, to seek input. However, nothing in this Section shall limit or impair the County's ability to timely submit applications for or receive permits, nor waive any permit processing or appeal timelines.

12.5 Separately, the County and the City recognize that in accordance with 36.58.080 RCW, a city is authorized to charge the County to mitigate impacts directly attributable to a County-owned Solid Waste facility. The County acknowledges that such direct costs include wear and tear on infrastructure including roads. To the extent that the City establishes that such charges are reasonably necessary to mitigate such impacts, payments to cover such impacts may only be expended only to mitigate such impacts and are System costs. If the City believes that it is entitled to mitigation under this Agreement, the City may request that the County undertake a technical analysis regarding the extent of impacts authorized for mitigation. Upon receiving such a request, the County, in coordination with the City and any necessary technical consultants, will develop any analysis that is reasonable and appropriate to identify impacts. The cost for such

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analysis is a System cost. The City and County will work cooperatively to determine the appropriate mitigation payments and will document any agreement in a Memorandum of Agreement. If the City and the County cannot agree on mitigation payments, the dispute resolution process under chapter 36.58.080 RCW will apply rather than the dispute resolution process under Section XII of the Agreement.

XIII. DISPUTE RESOLUTION

13.1 Unless otherwise expressly stated, the terms of this Section XIII shall apply to disputes arising under this Agreement.

13.2 Initial Meeting.

13.2.a Either Party shall give notice to the other in writing of a dispute involving this Agreement.

13.2.b Within ten (10) business days of receiving or issuing such notice, the County shall send an email notice to all Cities.

13.2.c Within ten (10) business days of receiving the County's notice under Subsection 13.2.b, a City shall notify the County in writing or email if it wishes to participate in the Dispute Resolution process.

13.2.d Within not less than twenty-one (21) days nor more than thirty (30) days of the date of the initial notice of dispute issued under Subsection 13.2.a, the County shall schedule a time for staff from the County and any City requesting to participate in the dispute resolution process ("Participating City") to meet (the "initial meeting"). The County shall endeavor to set such initial meeting a time and place convenient to all Participating Cities and to the County.

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13.3 Executives' Meeting.

13.3.a If the dispute is not resolved within sixty (60) days of the initial meeting, then within seven (7) days of expiration of the sixty (60)-day period, the County shall send an email notice to all Participating Cities that the dispute was not resolved and that a meeting of the County Executive, or his/her designee and the chief executive officer(s) of each Participating City, or the designees of each Participating City (an "executives' meeting") shall be scheduled to attempt to resolve the dispute. It is provided, however, that the County and the Participating Cities may mutually agree to extend the sixty (60)-day period for an additional fifteen (15) days if they believe further progress may be made in resolving the dispute, in which case, the County's obligation to send its email notice to the Participating Cities under this Subsection that the dispute was not resolved shall be within seven (7) days of the end of the extension. Likewise, the County and the Participating Cities may mutually conclude prior to the expiration of the sixty (60)-day period that further progress is not likely in resolving the dispute at this level, in which case, the County shall send its email notice that the dispute was not resolved within seven (7) days of the date that the County and the Participating Cities mutually concluded that further progress is not likely in resolving the dispute.

13.3.b Within seven (7) days of receiving the County's notice under Subsection 13.3.a each Participating City shall notify the County in writing or email if it wishes to participate in the executives' meeting.

13.3.c Within not less than twenty-one (21) days nor more than thirty (30) days of the date of the notice of the executives' meeting issued under Subsection 13.3.a, the County shall schedule a time for the executives' meeting. The County shall endeavor to set such

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executives' meeting a time and place convenient to all Participating Cities that provided notice under Subsection 13.3.b and to the County.

13.4. Non-Binding Mediation.

13.4.a If the dispute is not resolved within thirty (30) days of the executives' meeting, then any Participating City that was Party to the executives' meeting or the County may refer the matter to non-binding meditation by sending written notice within thirty-five (35) days of the initial executives' meeting to all Parties to such meeting.

13.4.b Within seven (7) days of receiving or issuing notice that a matter will be referred to non-binding mediation, the County shall send an email notice to all Participating Cities that provided notice under Subsection 13.3.b informing them of the referral.

13.4.c Within seven (7) days of receiving the County's notice under Subsection 13.4.b, each Participating City shall notify the County in writing if it wishes to participate in the non-binding mediation.

13.4.d The mediator will be selected in the following manner: The City(ies) electing to participate in the mediation shall propose a mediator and the County shall propose a mediator; in the event the mediators are not the same person, the two mediators shall select a third mediator who shall mediate the dispute. Alternately, the City(ies) participating in the mediation and the County may agree to select a mediator through a mediation service mutually acceptable to the Parties. The Parties to the mediation shall share equally in the costs charged by the mediator or mediation service. For purposes of allocating costs of the mediator or mediation service, all Cities participating in the mediation will be considered one Party.

13.5 Superior Court. Any Party, after participating in the non-binding mediation, may commence an action in King County Superior Court after one hundred eighty (180) days from

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the commencement of the mediation, in order to resolve an issue that has not by then been resolved through non-binding mediation, unless all Parties to the mediation agree to an earlier date for ending the mediation.

13.6 Unless this Section XIII does not apply to a dispute, then the Parties agree that they may not seek relief under this Agreement in a court of law or equity unless and until each of the procedural steps set forth in this Section XIII have been exhausted, provided, that if any applicable statute of limitations will or may run during the time that may be required to exhaust the procedural steps in this Section XIII, a Party may file suit to preserve a cause of action while the Dispute Resolution process continues. The Parties agree that, if necessary and if allowed by the court, they will seek a stay of any such suit while the Dispute Resolution process is completed. If the dispute is resolved through the Dispute Resolution process, the Parties agree to dismiss the lawsuit, including all claims, counterclaims, and cross-claims, with prejudice and without costs to any Party.

XIV. FORCE MAJEURE

The Parties are not liable for failure to perform pursuant to the terms of this Agreement when failure to perform was due to an unforeseeable event beyond the control of either Party ("force majeure"). The term "force majeure" shall include, without limitation by the following enumeration: acts of nature, acts of civil or military authorities, terrorism, fire, accidents, shutdowns for purpose of emergency repairs, industrial, civil or public disturbances, or labor disputes, causing the inability to perform the requirements of this Agreement, if either Party is rendered unable, wholly or in part, by a force majeure event to perform or comply with any obligation or condition of this Agreement, upon giving notice and reasonably full particulars to

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the other Party, such obligation or condition shall be suspended only for the time and to the extent practicable to restore normal operations.

XV. MERGER

This Agreement merges and supersedes all prior negotiations, representation and/or agreements between the Parties relating to the subject matter of this Agreement and constitutes the entire contract between the Parties [except with regard to the provisions of the Forum Interlocal Agreement]; provided that nothing in Section XV supersedes or amends any indemnification obligation that may be in effect pursuant to a contract between the Parties other than the Original Agreement; and further provided that nothing in this Agreement supersedes, amends or modifies in any way any permit or approval applicable to the System or the County's operation of the System within the jurisdiction of the City.

XVI. WAIVER

No waiver by either Party of any term or condition of this Agreement shall be deemed or construed to constitute a waiver of any other term or condition or of any subsequent breach whether of the same or a different provision of this Agreement.

XVII. THIRD PARTY BENEFICIARY

This Agreement is not entered into with the intent that it shall benefit any other entity or person except those expressly described herein, and no other such person or entity shall be entitled to be treated as a third-party beneficiary of this Agreement.

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XVIII. SURVIVABILITY

Except as provided in Section 8.1, 8.2, 8.3, Section 8.6.c, except 8.6.ciii and Section 8.6d, no obligations in this Agreement survive past the expiration date as established in Section III.

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XIX. NOTICE

Except as otherwise provided in this Agreement, a notice required to be provided under the terms of this Agreement shall be delivered by certified mail, return receipt requested or by personal service to the following person:

For the City:

For the County:

Director
King County Solid Waste Division
201 South Jackson Street, Suite 701
Seattle, Washington 98104

IN WITNESS WHEREOF, this Agreement has been executed by each Party on the date set forth below:

CITY of	KING COUNTY
(Mayor/City Manager)	King County Executive
Date	Date
Clerk-Attest Approved as to form and legality	Clerk-Attest Approved as to form and legality
City Attorney	King County Deputy Prosecuting Attorney
Date	Date

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Appendix D

Waste Reduction Model (WARM) Inputs Used in Analysis

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Table 1: Waste Reduction Model (WARM) inputs used in Chapter 6, Table 6-1

WARM Model Input	Cedar Hills - 134,000 MTCO2e	Waste Export - 78,000 MTCO2e	Mass Burn[1] + 12,000 – 80,000 MTCO2e	Notes
Materials (2015 Waste Characterization [2015 WC])	2015 WC	2015 WC	2015 WC	2015 Waste Characterization was adjusted to match a 52% recycling rate[2] before waste was assigned to WARM categories. The WARM model assumes negative emissions (an offset) due to sequestration of organic materials. About 29%[3] of landfilled materials are organics with negative emissions.
Region (regional/state or national average)	Pacific (WA)	Pacific (WA)	Pacific (WA)	Compared to elsewhere in the U.S., the energy displaced in the Pacific NW is largely hydropower instead of fossil fuels.
Source Reduction/ Recycling (displace current mix or 100% virgin)	none (current mix)	none (current mix)	metals (current mix)	This field calculates offsets from recycling. No added recycling was assumed from landfill options. Added metal recycling (equal to 2% on regional recycling rate) was assumed for Mass Burn.
Landfill gas recovery (no, recovery, national average)	recovery	recovery	recovery	For mass burn, gas recovery was assumed for landfilled bypass waste.
Gas Recovery (flare, recover for energy)	recover for energy	recover for energy	recover for energy	For mass burn, gas recovery for energy was assumed for the bypass waste that is landfilled.
Collection efficiency (typical, worst, aggressive, CA)	CA	aggressive	typical	Cedar Hills most closely matches the efficiency assumptions in the California regulatory collection scenario.
Moisture (national average, dry, moderate, wet)	wet	arid	national average	Decay rates and fugitive emissions are higher in wet climates than in other categories.
Anaerobic digestion (AD) (wet or dry)	wet	wet	wet	A choice must be made in the model, but because AD is not part of the proposal, it doesn't affect outcome.
AD digestate (cured, not cured)	cured	cured	cured	See above. Cured is the default.
Transport emissions (default <20 mi, actual >20 mi)	default	320 mi	default	A landfill choice has not been made but waste export shows the closest out of county landfill.

[1]A 2017 Normandeau Waste to Energy study was the source of these WARM estimates, but the study did not show model inputs. While Normandeau's WARM inputs are not available, results ranged from 12,000 to 80,000 MTCO2e per year. Their range is likely explained by a different waste composition assumption, exclusion of bypass waste disposal, and much longer time periods (and thus larger plants burning more materials) than in this division comparison, which used 2029 as the base year. The model inputs in the Mass Burn column are the division's assumptions of Normandeau's model inputs.

[2] Paper 16.7%, Plastic 12.2%, Food 20.5%, Wood 16.8%, Other Organics 15.3%, Metal 4.7%, Glass 2.6%, Electronics 0.4%, Household Hazardous Waste 0.9%.

[3] 2015 Waste Categorization material categories that create WARM offsets when landfilled include corrugated containers 3%, Dimensional Lumber 11%, Yard Trimmings 6%, Mixed paper 7%, and Drywall 2%.

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Appendix E

Responsiveness Summary

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Responsiveness Summary: Responses to formal comments made during the January 8 – March 8, 2018 public comment period

Commenter	Public Review Draft Chapter & Page Number	Comment	Response (Page numbers refer to the 2019 Plan)
Federal Way	Appendix D-1	Table 1should have a clearer description of the inputs, and the notes could be more descriptive in declaring why the input variables were used for the 3 disposal methods. For example, for "Moisture" it seems evident why "wet" is selected for Cedar Hills, but not as clear that "national average" is used for Mass Burn, when the WTE plant would presumably be located in King County.	EPA has a manual that thoroughly describes the WARM model and its inputs. A reference has been added to tell readers where to find more information.
Clyde Hill	Chapter 1, pg 1-3	The final plan adoption criteria noted in the first bullet on P. 1-3 requires cities representing ¾ of the total population within the plan to act within 120 days. There are a number of smaller cities represented in this Plan that are marginalized using this sole measure. Please consider adding a second criteria like ¾ of the population and ¾ of the number of cities...not just population.	The criteria guiding the Plan's final adoption are from the Amended and Restated Interlocal Agreements signed by all partner cities. The criteria cannot be changed without amending those agreements.
Zero Waste Vashon	Chapter 2 - *An increase in product stewardship...p. 2-18*	this category should also include optimizing/reducing product packaging, including shipping containers.	Thank you for your comment. Your suggestion has been added.
Zero Waste Vashon	Chapter 2 - *Expanding collection of Recyclable & Compostable Materials, p. 2-18 & 19*	All King county residents and businesses should have access to organics collection service or local compost facilities. In addition, more information should be provided about existing compost facilities and new development alternatives.	Chapter 4, Action 24-s and page 4-24 addresses service levels county-wide and on Vashon Island. A discussion of existing composting facilities and developing technologies is found on pages 5-26-28.
Zero Waste Vashon	Chapter 2 - *Figure 2-2, p. 2-4*	"System Graphic" needs some quantification and additional information, such as a figure caption explaining and quantifying material flows, numbers of private compost facilities, transfer stations, recycling facilities, etc. so the reader better understands the relative magnitudes of the various segments and components.	Compost facilities have been added to Figure 2-4. Table 5-5 is also added, including how much material is handled at compost facilities. In addition, tonnage handled at the private MRFs (Table 2-1) and construction and demolition facilities (Tables 4-7 and 4-8) has been added.
Zero Waste Vashon	Chapter 2 - *Figure 2-4. p. 2-9*	Please include the major compost facilities (such as Cedar Grove) as they fall within this category and do not seem to appear on any other maps.	The compost facilities in King County have been added to Figure 2-4.

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Responsiveness Summary: Responses to formal comments made during the January 8 – March 8, 2018 public comment period

Commenter	Public Review Draft Chapter & Page Number	Comment	Response (Page numbers refer to the 2019 Plan)
Zero Waste Vashon	Chapter 2 - Landfill gas p 2-12	A system should be piloted whereby we harvest landfill gasses, other gas-producing businesses, and future compost facilities and anaerobic digesters throughout the county and process them to RNG rather than flare off or carbon-cleanse them.	Since 2010, SWD has contracted with BioEnergy WA to produce natural gas from Cedar Hills Landfill gas. For more information, see https://www.kingcounty.gov/depts/dnrp/solid-waste/facilities/landfills/landfill-gas.aspx
Zero Waste Vashon	Chapter 2 - *Mitigation, p. 2-24*	Installing new distributed compost facilities on Vashon Island and elsewhere would greatly reduce vehicle emissions, energy use, and ferry costs required for garbage and yard waste transportation to eastern King County.	Thank you for your comment. The mitigation section has been edited.
Impact Bioenergy (Srirup Kumar)	Chapter 2 - p. 49 (2-24)K4C	Decentralized AD and other renewables should be included in "Mitigation" strategies.	Information has been added under "Mitigation" for this section on King County's overarching targets.
Impact Bioenergy (Srirup Kumar)	Chapter 2 - p.24 Policies	There is no mention of resiliency or circular economics of materials. These are components of sustainability too and should be incorporated and prioritized.	More information on this topic has been added to the discussion in Chapter 4 regarding a sustainable materials management approach.
Impact Bioenergy (Srirup Kumar)	Chapter 2 - p.29 (2-4) Figure 2-2 Systems Graphic	Should include decentralized solutions. A smaller orange loop should be added.	An addition has been made to Figure 2-2 to indicate decentralized solutions.
Impact Bioenergy (Jan Allen)	Chapter 2 - Page 2-18	The heading Expanding the Collection of Recyclable and Compostable Materials should say Expanding the Collection of Recyclable and *Degradable Organic Materials.* In this section we recommend you add a paragraph that says: There is a convergence of issues around source separated organic waste in King County. These include urban farming, food waste diversion through a variety of technologies, avoidance of synthetic chemicals in horticulture and agriculture, food banks, jobs and resiliency issues around food, smart grids, carbon footprint, climate change, alternative fuel vehicles, and distributed renewable energy. This convergence will continue for the foreseeable future and King County will have to be flexible and innovative to remain in a leadership role since organic waste is such a significant organic fraction in both the waste and recycling streams. Organic waste touches all these issues.	Thank you for your suggested edits. Changes have been made to these sections.

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Zero Waste Vashon	Chapter 2 - *Processing of Commingled Recyclables, p. 2-8*	Please include a discussion of costs involved with processing and explain who benefits from recycled material sales.	There is a cost to process the materials paid by curbside customers. The companies that process the recyclables benefit from the sales, but it can also lower the cost of recyclables collection.
Zero Waste Vashon	Chapter 2 - *Protecting Natural Resources p. 2-21*	*Potential new* Composting and ReUse facilities should be mentioned here.	Thank you for your comment. Your suggested edits have been made.
Celia Parker	Chapter 2 - Representation	Need for Rural Area representation on Advisory Committees (it appears from the SWD web site that we are "represented" by KC Council Staff). Who is our representative on KC Council? How does that person know what we want?	The Solid Waste Advisory Committee is comprised of residents and representatives from the waste industry, cities, and other businesses. There currently is one representative from the unincorporated area, a vacant agricultural position, and other vacant seats. The Division will be recruiting for vacant seats in the coming months.
Zero Waste Vashon	Chapter 2 - *Revenue Sharing...p. 2-5*	Please explain why Vashon Island lacks a certified revenue sharing agreement unlike other WUTC-regulated areas in King County.	Waste Connection, the franchise hauler on Vashon, is responsible for initiating a revenue sharing agreement.
Zero Waste Vashon	Chapter 2 - *Sequestration, p. 2-24*	Production of biochar by pyrolysis of wood & yard waste would also sequester Carbon for millennial timescales as well as improving soil quality	Thank you for your comment. The sequestration section has been edited.
Clyde Hill	Chapter 2, pg 2-25 Equity and Social Justice	This section is critically important as it defines the key principles guiding the operation of the Solid Waste Division. In recent discussions relating to the operation of the Factoria transfer facility (including demand management) and the need for an additional transfer station in the northeast, it was these principles that were crucial in supporting the position of cities in the northeast. The wording in this section needs to be carefully reviewed. It is recommended that two additional bullets be included on page 2-24 as follows: • Provide the same level of service to all communities (e.g., estimated travel time to facility, time on site, facility hours, recycling services) • Consistent pricing throughout the system.	Thank you for your comment. These concepts have been added.

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Greater Maple Valley UAC	Chapter 2, Policy ES-2	It appears the Rural Area only is represented on the Advisory Committee by King County Council Staff?	The Solid Waste Advisory Committee is comprised of residents and representatives from the waste industry, cities, and other businesses. There currently is one representative from the unincorporated area, a vacant agricultural position, and other vacant seats. The Division will be recruiting for vacant seats in the coming months.
Woodinville	Chapter 3	The City believes that reliable data allows jurisdictions like Woodinville as well as other entities to make well-informed decisions locally and, collectively, for the region. Thus, Woodinville supports the following Comp Plan recommended actions regarding forecasting and data: • **1-fd**: Standardize the sampling methodology and frequency in tonnage reports submitted to the division and the cities by the collection companies to improve data accuracy • **2-fd**: Perform solid waste, recycling, organics, and construction and demolition characterization studies at regular intervals to support goal development and tracking • **3-fd**: Monitor forecast data and update as needed Data collection and forecasting relating to system use and capacity, as well as growth in populations will enable the region to accurately site waste handling facilities in areas where service is lacking.	Thank you for your comment and support of the recommended actions.
SeaTac	Chapter 3	With the pace of technological change increasing rapidly, yet our Comprehensive Plans only being updated on a five-year cycle (or longer) we need to forecast trends and get our long-range plans in step with emerging technology. NOW.	Thank you for your comment.
Waste Management	Chapter 3 – *Page 3-10, Generators of Construction and Demolition Debris*	Regarding a recycling market for asphalt shingles, has King County identified a universal, viable, and stable market that has capacity for the ongoing receipt of asphalt shingles? WMW has found that there is a small market for asphalt shingles given that there has not been sizable industry	Through the LinkUp program, SWD has actively been working to develop markets for the use of used asphalt shingles in paving projects. See more information here:

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		demand for the recycling of these materials. If a recycling market does not have complete capacity for receipt of asphalt shingles, then demand for that market is lacking. What is King County doing to help develop a market, such as including recycled asphalt shingles in the county's road paving projects?	https://www.kingcounty.gov/depts/dnrp/solid-waste/programs/linkup/shingles.aspx Recycled shingles have been used in several county projects including at the Bow Lake Recycling and Transfer Station and in King County Roads Services projects.
Zero Waste Vashon	Chapter 3 - *Ecology Survey Data p. 3-12*	A 3 year lag for data availability seems excessive in this digital age and should be decreased, efforts should be made to acquire timely and comprehensive data relevant to waste & recycling.	Thank you for your comment. SWD is dependent on the Washington State Department of Ecology for the data.
Zero Waste Vashon	Chapter 3 - *Figure 3-1, Transfer Station Population forecast 2025-2040 p. 3-3*	The bar-graph should include current (2015) values for each area as a baseline.	Thank you for your comment. Figure 3-1 is showing projected population numbers by service area that are based on Forecast Analysis Zones. Current population numbers are not available in this format.
Zero Waste Vashon	Chapter 3 - *Figure 3-4, p. 3-5*	The bar grab should include several additional time points to illustrate trends (eg, perhaps also 2010, 2006, 2002).	Thank you for your comment.
Zero Waste Vashon	Chapter 3 - *Forecasting & Data, p. 3-1*	As demonstrated by electricity providers, when consumers have access to their usage data, they are able to reduce usage and optimize peak loads. If consumers were aware of the waste quantities at various local and regional scales, they could potentially modify their behaviors. We need more geo-referenced temporal data.	Thank you for your comment. Usage data for solid waste is not as readily available as it is for energy, so would be difficult to implement
Zero Waste Vashon	Chapter 3 - *Multi-Family p. 3-7 & Self Haulers p. 3-9*	The disposed volumes are very high yet recycled volumes are disproportionately low for these 2 groups compared with businesses & single family residential, so focused efforts should be made to increase recycling rates among these 2 groups! Need more commitment to education, services, and incentives	Although the recycling volumes are low and disposed tons are higher in comparison, the overall tons generated by these two generator types is much smaller when compared to single-family and commercial generators. SWD does have education and outreach for multi-family and some cities choose to provide greater emphasis on multi-family collection. Since the beginning of 2018, SWD has placed a ban on certain recyclable materials being disposed at the transfer stations where recycling opportunities exist. This ban has been accompanied

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			by an education campaign and information provided to customers at the transfer stations.
Federal Way	Chapter 3, Figure 3-3	Explain why tonnages increase and decrease around 2029 As depicted, Fig 3-3 shows recycling levels at about 1/4 of what is disposed in 2017, while the text lists 52%. Use a graphic more similar to the one in the earlier draft which "stacked" both types of tonnages, creating a better visual comparison of the total.	Figure 3-3 has been updated with the more recent tonnage forecast and corrected to more accurately reflect the garbage and recycling proportions.
Federal Way	Chapter 3, Figure 3-5	1. Please be consistent in color use (recycling is shown as blue in a prior chart, and blue is often the container color associated with recycling). 2. This circle graph makes it appear that the blue area is larger than the green area. (53% v. 47%) 3. The category "other materials" shows 0% recycling, so please make changes as suggested by this comment. Recycling events collect "other materials" like wood, electronics, batteries, textiles, even bicycles. Presumably, these materials may be outside what was measured in coming up with these percentages (or may be less than 0.5% of total diversion, and so effectively 0%). But the figure says 0% of other SF materials are diverted to recycling. Perhaps say <l% and use "-" instead of "O" for the tons recycled. Presumably, these charts focus on MSW that the system is designed to handle, so options like reuse or donation are not counted. Figure 3-5 note 'a': The term 'recycled' is out of place. Put it first or delete in all 3 charts.	Thank you for your comment. Your suggested edits have been made. Tonnage from the special recycling collection events is included in the total recycling rate (reported by Ecology).
Bellevue	Chapter 3, Forecast	In Chapter 3, the Plan provides context for forecasting the future solid waste stream for the region. While the narrative describes how factors related to population and economy are considered in the solid waste forecasts, it is unclear if the forecasts have captured the potential for significant changes or disruptions in	Thank you for your comment. Your suggested edits have been made to the Forecasting section, starting on page 3-1.

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		waste characteristics and recycling markets. For example, the closure of some of China's recycling import markets and the possible increased light weighting of packaging may drive significant changes in the region's disposal needs. *Requested change (p 3-1 to 3-4): Expand the Forecasting section to describe how the forecast does or does not consider potential substantial changes in waste stream characteristics and/or major disruptions in recycling markets.*	
Clyde Hill	Chapter 3, pgs 3-1 through 3-4	Note that the forecasting of tonnage of waste disposed in the landfill is done in two steps (see top two paragraphs on page 3-6). In the first step, a baseline forecast is completed which assumes the percentage of waste recycled remains constant (57%). In the second step, the baseline is adjusted to exclude material diverted from disposal as a result of additional recycling. It is not clear in the Comprehensive Plan whether any of the projections that are included were prepared using the second step. It would be helpful if each projection clearly stated which technique was used in its preparation. Given (1) the recycling rate has been difficult to forecast and (2) the sensitivity of tonnage forecasts and related life of the Cedar Hills Landfill, it is very important that readers understand the recycling rate assumptions used in each projection.	Thank you for your comment. The Forecasting section has been edited to describe the forecasting inputs and process to the forecast more clearly.
Greater Maple Valley UAC	Chapter 3, Policies FD-1, FD-2, FD-3, and Action3-fd	Such information should be made available to the Public for education purposes and to further the goals of the Plan.	Thank you for your comment.
Traci Portugal	Chapter 4	Since wet cardboard is NOT recyclable yet I see tons of boxes piled on top of or next to recycle bins when it's raining each week, having large recycle bins with lids in central locations where people can drop off used boxes would be	Thank you for your comment. Most of our transfer stations have covered receptacles to collect old cardboard containers.

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		great! Or coordinate with local schools to allow use of their recycle bins? Create bins where broken down boxes can be inserted but the container always has lid over too so rain doesn't ruin cardboard if someone leaves lid open.	
Impact Bioenergy (Srirup Kumar)	Chapter 4	Chapter 70.95.N RCW which requires manufacturers of the covered electronic products (TVs, computers, monitors, and portable DVD players) to provide collection services in every county, city, or town with a population greater than 10,000. There are no sites or collections services on Vashon, where the population is now 12,000+.	Thank you for your comment. The Washington Materials Management and Financing Authority is tasked with implementing the state law with oversight from the Department of Ecology. The law does not require there to be a collection site on Vashon Island because it is a part of unincorporated King County, and collection sites are available throughout the county. For more information, see http://wmmfa.net/
Clyde Hill	Chapter 4	Operation Green Fence - How does China's decision to ban the import of 24 varieties of solid waste and recyclables (Operation Green Fence) impact the ideas and goals within this Chapter?	The Plan is written to be flexible, giving the County and cities the structure to provide collection and outreach programs, but also the ability to adjust to changing conditions.
Covington	Chapter 4	Chapter 4 mentions the potential to phase out the recycling grants to cities program as enhanced recycling services are added to renovated transfer facilities. Although we support the need to improve services at the transfer facilities, we feel it is important to continue with these recycling grant programs with local cities. The elimination of these programs will result in a reduced level of service and an increase in illegal dumping of these types of materials.	The Plan does not contemplate phasing out grants to cities. The Plan mentions that there may be alternative ways for cities to provide for special recycling collection events. Bothell provides vouchers to their residents to recycle materials at the Shoreline Recycling & Transfer Station, instead of holding recycling collection events. King County mails vouchers to White Center residents to recycle at the Bow Lake RTS instead of holding recycling collection events in that community.
Kirkland	Chapter 4	The City of Kirkland is supportive of the Plan's goals and actions designed to increase diversion and prevent waste. The successful expansion of the landfill and creating capacity through 2040 is contingent upon our ability to collectively	Thank you for your comment. Changes have been made to reflect that we will not be able to reach our goals without the commitment of all cities, the county and our solid waste partners to implement

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		implement and achieve the recycling diversion and waste reduction and recycling goals through the implementation of the improvements to infrastructure, education and outreach, incentives, mandates, and enforcement. However, we believe that the region cannot collectively achieve any of these goals without an unwavering commitment on the part of all cities to implement most if not all of the recommended tools such as mandatory garbage collection and recycling. If all cities do not implement all the actions, only incremental improvements will occur. It is important that the Plan also explicitly express the gravity of indecision and inaction.	the recommended tools and strategies discussed in the plan.
Kirkland	Chapter 4	We recognize that implementing the variety of actions in the Plan can be expensive and we encourage the County to continue to provide and even increase grant funding and technical assistance to all city members of the system to help us achieve our waste prevention and recycling goals.	Thank you for your comment. Actions 2-s, 12-s, and 13-s are examples of actions that the division and the cities can work together on to improve the grant program.
Maple Valley	Chapter 4	The City of Maple Valley recommends that King County continue to allow cities to use King County grant funds for recycling collection events and not phase out collection events as an option. The public relies on these events to recycle materials not collected curbside or at transfer stations. Phasing out the recycling events would be perceived by the public as a reduction in City services, and could lead to increased illegal dumping.	Thank you for your comment. The county would not change the grant guidelines that currently allow cities to spend those funds on recycling collection events without first consulting with the cities.
Maple Valley	Chapter 4	We encourage the development of a new grant program to support cities and other stakeholder help meet waste reduction and recycle goals identified in the plan.	Thank you for your support of a new grant program.
Redmond	Chapter 4	Redmond supports the goal to divert 70% of garbage through recycling. As the region implements the Growth Management Act (GMA), we are seeing a significant increase in multifamily construction. This aligns with the GMA vision to accommodate more people and jobs through higher densities in cities and limiting sprawl. In light of this planned increase in multifamily housing, we urge the County to work with cities on actions that	Thank you for your comment. Improving multi-family recycling is an important part of achieving our goals. King County, working with the haulers, has developed multi-family recycling best practices. These best practices can be used by any jurisdiction that wants to improve their multi-family recycling programs.

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		increase multifamily recycling	
Woodinville	Chapter 4	Woodinville also supports the Comp Plan's recommended actions 1-s through 35-s, which concern sustainable materials management, and the goal of increasing the recycling rate in the region. The EIS states that increased recycling may result in a net increase in truck trips and affect specific transportation routes (EIS at 1-1, 1-2, 1-3). As the rate of recycling increases, Woodinville will experience additional impacts related to increased tonnage and traffic to the Cascade Recycling Center. Nevertheless, Woodinville recognizes that increased recycling is better for the region because it represents a more sustainable approach to materials management. With respect to the various EIS alternatives for achieving increased recycling, Woodinville is open to adopting practical and effective regulations in coordination with county efforts but while minimizing increases in administrative costs where possible (*see* EIS at 1-1, 1-2, 1-3).	Thank you for your comment. This comment is also addressed in the responsiveness summary for the EIS.
Celia Parker	Chapter 4	On the Plan Chapter 4 Summary of Recommended Actions 3-s and 28-s Among parties to educate, can we consider manufacturers? Would/could there be an effort to work with manufacturers to reduce wasteful packaging? E.G. At a health food store I bought bags of tea in a ~7 inch tall plastic barrel. At the time I had to drive 10 miles to Fairwood to recycle the plastic. I looked up and emailed the company that sold the tea and gave a packaging suggestion. They revised their packaging to a paper-like sealable bag that could be easily thrown away.	Thank you for your comment. SWD does encourage manufacturers through the LINKUP program to use recyclable materials as feedstocks. SWD also participates on the NW Product Stewardship Council to work at a regional level to implement programs where manufacturers take responsibility for the products that they produce.
Celia Parker	Chapter 4	I've noted the worst garbage management among apartment dwellers. I think they have no incentive, besides lack of training (parents should do).	Thank you for your comment. Efforts are underway to improve education and outreach to multi-family developments.

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Zero Waste Vashon	Chapter 4	More education/support should be provided toward educating constituents on what/how to sort for comingle Shoppers could be educated to look for recyclable containers and bags at their grocery store. Consider banning plastic bags in King County. Need more commitment to education and research and development. Solutions are out there. KCSW needs to process and implement these solutions, therefore we need to make this plan more dynamic and provide the ability to both R&D, educate, and pilot. Need novel education paths, including promotion of short educational films about how things are sorted at our sorting stations, how/what to compost, and a general knowledge of plastics and the waste stream.	Thank you for your comment.
Waste Management	Chapter 4 – *Action 4-S*	WMW supports the exploration of a product stewardship strategy and concepts for the management of toxic materials or materials that can be difficult to manage. However, we do not advocate product stewardship or extended producer responsibility (EPR) for traditional recyclables such as paper and packaging for the following reasons that we hope that King County will adequately consider. EPR for paper and packaging focuses solely on the end-of-life management of materials, rather than considering the full lifecycle impacts of materials, along their entire life. Producer focus will be on end-of-life recycling of their products, instead of reducing energy and greenhouse gas outputs and impacts along the lifecycle of the product, especially in upstream design and production of the materials. Thus, EPR for paper and packaging will make it impossible to change the focus on achieving broader environmental goals such as reducing carbon footprints.	Thank you for your comment. You raise many important issues that warrant further discussion as we move forward with implementing the Plan. There will be ample opportunity to discuss these issues both with our advisory committees and other venues.

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		There is no evidence that EPR increases recycling. Successful, sustainable recycling programs are the result of comprehensive and sweeping local solid waste policies and programs, such as those offered by King County in this Plan that achieve high diversion rates. These developed and thoughtful solid waste policies help drive consumer behavioral changes by crafting successful recycling programs that focus on social behavior changes and creating the right local incentives. That is, solid waste policies are needed to drive recycling programs, not money from producers and manufacturers. Our current system is built around local communities and accountability. Local officials hear from their neighbors and constituents when something is not working. That relationship link between local government and communities will be broken with an EPR system for paper and packaging. Producers will control the programs, creating uniform statewide service offerings. There will be no role for local ordinances. Many local communities have created rates, bans and incentives to drive successful recycling programs. These ordinances can reflect shared local values, environmental ethos, and respect differences in geography, population density, ecosystem vulnerability and economics. With manufacturers running a uniform statewide program, local governments have few incentives to innovate with education programs, variable fees, or innovative service options. Finally, EPR for packaging and paper is focused on driving to the lowest cost as the primary goal. Consequently, producers are unlikely to pursue high performance programs and value assets that are important to local	

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		government contracts such as safety, compliance, natural gas fleets, demonstrated reliability, and customer service. EPR fees are also regressive with the increased costs and fees associated with EPR born disproportionately by low-income households who spend a higher portion of their income on packaging than on durable goods.	
Waste Management	Chapter 4 - Action 14-S	Regional capacity for recycling of materials is not developed via education and enforcement of disposal bans, but, rather creating and offering incentives will build capacity. WMW encourages King County to generate incentives to promote investment in construction and demolition debris facilities and diversion of these materials from the waste stream. As a result, self-regulating industry enforcement would also evolve in developing and shaping the market demand for these materials.	Thank you for your comment. Recommended Action 14-s has been edited to reflect your comments (removed the word "capacity"). Further discussion of possible incentives could occur at a future construction and demolition materials stakeholders' meeting.
Waste Management	Chapter 4 - Action 26-S	WMW recommends adding an additional action item to monitor recycling markets, at the very least on an annual basis, especially with market disruption factors in play such as China's National Sword policy. We certainly support establishing a formal process, and related criteria, to remove materials from the designated recyclables list as market conditions may require. Currently, there is an informal process to eliminate items from the list, which generally involves asking processors if the facility currently accepts a material stream. As previously stated, we believe more formal procedures are needed here.	Thank you for your comment. Policy FD-3 supports monitoring recycling markets. Further discussion with stakeholders is needed to determine the scope of this work. The implementation of Recommended Action 26-s would develop a process and criteria to amend the designated recyclables list.
Kurt Hughes	Chapter 4 - Collection	It would be WONDERFUL if the garbage trucks didn't collect on Avondale during morning rush hour.	Thank you for your comment.
Traci Portugal	Chapter 4 - Collection	Allow recycling pick up to be weekly as we are always full each week.	Thank you for your commitment to recycling. Weekly recycling pickup is allowed, but most haulers do not collect weekly. It may be possible to get a second container from your hauler to accommodate your recycling.
Traci Portugal	Chapter 4 - Collection	Incentives for using smaller trash cans?	Thank you for your comment.

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Terra Rose	Chapter 4 - Collection	In reviewing the draft comp plan out for public review, CM Dunn's office noticed that policy 29-s ("Consider improvements to single-family collection services in the unincorporated area to increase the recycling rate") is cross-referenced to the discussion on page 4-28. Page 4-28 discusses single-family residential minimum collection standards and states on the following page that "Based on this evaluation, it is recommended that minimum collection standards be adopted by the cities and unincorporated areas to provide the optimal service level for reducing waste and increasing the diversion of recyclables and organics from disposal." The chart suggests garbage collection to be a "minimum of once a month." Given the proviso response indicating that the Division is not going to pursue reduced garbage collection in the unincorporated areas, can you help us understand the choice to link 29-s to that particular discussion and not a broader discussion of ways to increase recycling in the unincorporated areas?	We will review which page should be referenced for explaining approaches to improving unincorporated single-family collection. The minimum standards table shows the lowest level of service that a jurisdiction in the regional system can choose. It does not obligate a jurisdiction to choose the lowest level. The garbage minimum is monthly because some cities offer once a month garbage pick-up in some circumstances and the plan acknowledges that level of service. However, most jurisdictions have weekly garbage pick-up. Because weekly pick-up is a higher level of service than the monthly minimum, it also is a service choice allowed by the plan. The plan does not include a change in garbage pick-up frequency in the unincorporated area.
Sharon Eno	Chapter 4 - Composting	Currently, in Shoreline there is no compost program that is required. There is so much food waste that should be composted. People are totally illiterate about the need for this and how to do it. Making composting mandatory should be a part of any smart waste disposal program. Please consider making this mandatory.	Thank you for your comment. Although it has been discussed many times, the county and the cities have not been able to reach agreement about making garbage, recycling, and/or organics collection mandatory. The City of Shoreline does offer curbside yard/food waste collection services and could institute mandatory programs if residents wanted it.
Ann Siems	Chapter 4 - Education	Also educate via advertising of all kind. People think, oh it's just a paper cup, I am so good, I will recycle it. They have no idea how much pollution is created via the paper industry, the difficulty of recycling such cups and the lids, not to mention the stupid straws. Make waste HURT. And much more education!!! Show people where their garbage, their leaking oil etc. goes!!!	Thank you for your comment
Zero Waste Vashon	Chapter 4 - *Figure 4-1 p. 4-4:*	**Composting** facilities are mentioned with no details-how many? Where are they located? Please include a discussion	Compost facilities in King County have been added to Figure 2-4, a map that also includes materials

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		of biochar, a product of pyrolysis of dried organic material, a great soil amendment that additionally sequesters carbon for more than millennial timescales.	recovery facilities. In addition, a table has been added to Chapter 2 that includes the names, locations, and tonnage collected at each facility. A mention of biochar has been added.
Zero Waste Vashon	Chapter 4 - *Figure 4-2 Recycled tons & rate p. 4-6*	A longer timeline (perhaps including 1990, 2000) would be useful to better appreciate the trends.	More years have been added to Figure 4-2.
Zero Waste Vashon	Chapter 4 - *Figure 4-5. 2015 Recycling potential p. 4-16*	Need to include data for several other years, such as 2000, 2010.	Figure 4-5 is based on the most recent waste composition study, and is the most relevant information for this Plan. Past waste composition studies are available on SWD's website and can found at: https://www.kingcounty.gov/depts/dnrp/solid-waste/about/waste-monitoring/waste-documents.aspx
Zero Waste Vashon	Chapter 4 - *Likewise, the County will consider...unincorporated area in which to focus...p. 4-7*	The Vashon Island Laboratory offers an ideal opportunity to perform field trials or pilot programs.	Thank you for your comment
Cedar Grove	Chapter 4 - Organics collection	Cedar Grove suggests the County strongly consider no longer providing exemptions to the requirement of weekly curbside collection of organics. These exemptions, allowing bi-weekly residential collection, do not support County stated goals for managing garbage and recycling for the next 20 years. A firm commitment to weekly collection of organics will increase diversion from the landfill and help the County reach its 70 percent goal. This is a simple but effective way to increase participation in recycling County-wide. County studies show that one of the primary barriers to public participation in organics programs is the fear, real or perceived, of recycling food scraps. And the allowance of bi-weekly collection of organics serves as a deterrent to	The County does not issue exemptions. The Health Department establishes minimum frequencies of garbage and organics collection. In developing this draft Plan, the advisory committees identified the minimum standards for organics collection to be at least every other week, as allowed by the Health Department. This does not prevent cities from having more frequent, weekly collection. The County may consider changes to collection frequencies in the unincorporated areas in the future.

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		participation in the program and increases the volume of food and yard waste not being diverted from the garbage. In the County's 2008 study, "Overcoming the Ick Factor: Increasing Participation in Food Scrap Recycling in King County, WA", weekly collection was identified as a change that would positively impact participation by 71% of respondents. Additionally, weekly collection will ensure that transfer and processing facilities receive fresh and less odiferous material that otherwise could have spent many weeks decomposing in bins. The weekly flow of material, therefore, will mitigate community impacts. County resident perceptions and behaviors have evolved significantly over the past 10 years towards a commitment to keeping valuable natural resources out of the landfill and into productive use. Weekly collection is a proven way to influence those who are not participating in organics recycling to do so. It will also likely increase the participation of those already committed to the program through increased opportunities. Moreover, for the ratepayer, standardizing collection frequency would bring service equity across the cities within the County, and increased diversion will provide desired flexibility regarding decisions for disposal of garbage over the long term.	
Zero Waste Vashon	Chapter 4 - Organics p 4-4	More commitment to organics processing and products/marketing! On a societal level and with King County Solid Waste as the driver we should make a societal commitment to go organic whenever possible. Packaging, ink dies, plastics, paper products are examples of what should be diverted from waste to resource. King County organics processing is now operating at maximum capacity. Up to 30% of our waste stream is still organic based.	Thank you for your comment. Support for organics processing and products/markets will continue to be a focus in our efforts to achieve higher recycling levels. This is reflected in Policies S-5, S-7, S-8 and Recommended Actions 24-s, 28-s, 33-s.

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		King County Solid Waste should concentrate on processing this out of the waste stream. We should be able to divert ½ of this from waste to resource thereby increasing our recycle rate 10% across the board! By doing this we increase the life span of Cedar Hills landfill, through environmental economics drive markets towards more organics use, and get us ½ of the way to our goal of 70% recycle rate! Therefore: we need the ability to better sort at the individual, hauler, and community level, and we need more compost facilities ideally spread throughout the county. This encourages community participation and makes the products more accessible.	
Impact Bioenergy (Srirup Kumar)	Chapter 4 - p. 104 (4-18)	Commercial grant project results are merely linked, please mention Impact Bioenergy and other projects, ideally sharing knowledge and contrasting projects:	Thank you for your comment. Information on the projects that have been awarded competitive grants under this program have been added to this section.
Impact Bioenergy (Srirup Kumar)	Chapter 4 - p. 90 (4-40) re: Regarding Cedar Hills Regional Landfill	"Organics in the landfill produce methane, most of which is captured and converted to natural gas."	Thank you for your comment.
Waste Management	Chapter 4 - Page 4-12, End-of-Life Management	In discussing product stewardship here and the financing of an EPR system, consumers pay more as manufacturers either incorporate the cost of EPR in their pricing (internal) or are allowed to charge environmental handling fees (external) to recover the additional costs of participating in EPR-style programs.	Thank you for your comment.
Waste Management	Chapter 4 - *Page 4-30, Table 4-5. Single-Family Minimum Collection Standards*	Polycoated paper and aseptic packaging (because they once held food) were specifically mentioned in China's National Sword as a banned material in mixed paper being imported into China. The future for mixed paper may not include biologicals since this conflicts with the market desire for non-food paper only. WMW also suggests a recognition in the table that grades 1 and 2 plastics do have long-term stable, viable end markets. However, grades 3 through 7 plastics have challenges in recycling as market disruptions continue.	Thank you for your comment. A new section that addresses issues related to China's National Sword has been added to the Markets for Recyclable Materials section. The list of materials in the minimum collection standards is based on the materials currently collected in all curbside programs. Opportunities exist to expand materials collected by all curbside

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			programs to reach more consistency among jurisdictions and less contamination.
Waste Management	Chapter 4 - Page 4-5, Waste Prevention and Recycling Goal and Targets	Although King County addresses sustainable materials management later in this same chapter, the County could be a leader in this arena by fully embracing sustainable materials management (SMM) principles and begin a departure from solely evaluating recycling goals based on weight, such as the County's interim goal of achieving 70% recycling. SMM represents a paradigm shift in how we look at and manage materials by reducing environmental impacts throughout all stages of a product's life cycle, as these materials move through the economy, from resource extraction to end of life management. SMM's emphasis is on protecting human health and the environment by advancing the sustainable use of materials throughout their lifecycle to minimize waste and environmental impacts, including reductions in greenhouse gas emissions and in water and energy use. Solid waste policies should encourage true recycling and not "diversion for diversion's sake." The best way to embrace SMM is to adopt Life Cycle thinking and analysis, in which each material is evaluated at a broader level to determine its optimal disposition. Instead of measuring success based on a percentage recycled, success should be awarded for greenhouse gas emissions reduced, for example. In using traditional weight-based recovery or recycling rates, recovery of materials is treated the same: A ton is a ton is a ton and all recovery is treated the same (recycling = composting = "counting" energy recovery). Accepting only weight-based recycling goals does not appropriately address or value the solid waste hierarchy. In particular, little	Thank you for your comment. Although this Plan includes a 70% interim recycling goal, it also includes other targets that help to assess waste reduction (per capita and per employee waste disposed and waste generated targets). In addition, Action 20-s identifies the need to develop a target for reducing greenhouse gas emissions from disposed waste. The 70% goal remains in the Plan because the majority of the advisory committee members wished to keep it.

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		significance is given to waste reduction activities or any broader Life Cycle thinking. However, SMM compares the environmental outcomes of waste management, focuses on the full life cycle, not only end-of-life management, and ultimately supports more and better recycling and waste prevention.	
Ann Siems	Chapter 4 - Product Stewardship	People start to change behavior when it costs money. It is time that we ask fees for all the garbage that is produced via throw away containers, charge for coffee cups to go, charge more for people who don't recycle properly etc.	Thank you for your comment.
Debbie Shapiro	Chapter 4 - Recycling	I'd love for recycling to be weekly, rather than bi-weekly. We wind up with an overfull can and have left over that we have to hold for the next 2 weeks.	Thank you for your comment. You can request an additional recycling cart or set out additional materials as allowed by your local hauling company.
Republic Services	Chapter 4 - Recycling	King County has a goal to recycle 70 percent of our waste stream, an increase from 52% today. What sorts of ideas do you have to help us reach this ambitious goal? The goal to recycle 70 percent of the waste stream is built using flawed data*. Consider a goal that asks cities to reduce the amount of waste going to the landfill (isn't that the desired outcome?) For example, if the average pounds per household is 26 pounds in Kent or 23 pounds in Bellevue, cities could be asked to campaign their citizens to reduce one pound per household per week. *King County uses tonnage data (total amount at the curb minus the weight of recycling and organics). This premise is flawed because 1. Recycling is becoming lighter and lighter (it used to take 40,000 empty water bottles to make a ton; today it takes 90,000). 2. There are third-party recyclers who do not report their data to the county or state 3. There are third-party landscapers (for homes and commercial properties) who do not report their tonnage data to the county or state.	Thank you for your comment. Although this Plan includes a 70% interim recycling goal, it also includes other targets that help to assess waste reduction (per capita and per employee waste disposed and waste generated targets). In addition, Action 20-s identifies the need to develop a target for reducing greenhouse gas emissions from disposed waste. The 70% goal remains in the Plan because the majority of the advisory committee members wished to keep it.

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		In essence, the 70 percent goal asks for a number that cannot be counted and is, therefore, flawed. The ONLY number that can be counted on reliably is the tonnage going to the landfill. THAT is the number that should inform the goal.	
Auburn	Chapter 4 - Recycling	The City of Auburn would like to thank the SWD for its continued guidance and support to assist cities as we work to reach our waste reduction and recycling goals. The efforts to enhance recycling opportunities and increase product stewardship are invaluable. We look forward to continuing working together to keep solid waste rates as low as possible by reducing, reusing, and recycling.	Thank you for your comment
Carnation	Chapter 4 - Recycling	As City Manager of the City of Carnation, I want to say thank you for working to update the Comprehensive Solid Waste Management Plan. Effective management of Solid Waste is critical and it is important to be forward thinking and progressive when making decisions on the future of this function. I believe King County is taking the right steps in developing a great plan by accepting public comment. As King County moves forward with these services, it is essential for the future of King County to continue its commitment to recycling. To reach our goal to recycle 70 percent of our waste stream, we must continue to educate the public on the benefits and best methods for recycling. When in doubt, residents will most likely deposit the item into the waste stream. This education effort must be combined with a commitment from local government to make certain recyclables are recycled. The recycling market is ever changing and nothing discourages residents from recycling more than knowing the final destination for these items is a landfill.	Thank you for your comment.
Jim Loring	Chapter 4 - Recycling	Recycle as much as is economically feasible and be willing to accept this may well fall short of some arbitrary 70% goal.	Thank you for your comment.
Issaquah	Chapter 4 - Recycling	The City of Issaquah is supportive of the Plan's goals to increase diversion and prevent waste. As a City, we have	Thank you for your comment.

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		had a strong focus on waste prevention and diversion for many years, and believe there is still progress to be made in this area that can reduce pressure on capacity at the King County Landfill. As a founding member of the King County Cities Climate Collaboration, the City has already committed to reaching a goal of 70% recycling, and urges the County to maintain that goal within the Plan and play a strong leadership role in organizing all of the cities to push towards that goal.	
Teresa Allen	Chapter 4 - Recycling	Styrofoam should not end up in landfill. We generate a lot of Styrofoam at our work site at South WW Treatment Plant and it all ends up in our local landfill. I would like to see this waste stream recycled but unable to generate any interest with my coworkers. The directive needs to come from Solid Waste, with guidance and information.	Thank you for your comment. Styrofoam is collected at both the Bow Lake and Shoreline Recycling and Transfer Stations. SWD does not have the authority to direct what materials are collected at the South Wastewater Treatment Plant. Styrofoam is a difficult material to collect – it is very bulky, but very light in weight.
Kevin Jones	Chapter 4 - Recycling	A separate collection bin for plastic bag waste should be provided on Vashon	Thank you for your comment. The division evaluates materials to collect at recycling and transfer stations based on the availability of space, cost and recyclability.
Kevin Jones	Chapter 4 - Recycling	A separate collection for Styrofoam should be provided on Vashon	Thank you for your comment. The division evaluates materials to collect at recycling and transfer stations based on the availability of space, cost and recyclability.
Valerie King	Chapter 4 - Recycling	I am against King County instituting mandatory recycling requirements (like the way Seattle made it mandatory that people not throw any food in the garbage or be fined. So they have to put all food in the yard waste even if that encourages pests & rodents). I think the only way for more to be recycled is for more things to be packaged in recyclable packaging. As far as I know, #5 plastic (PP) is not recyclable, and yet a lot of foods are packaged in PP. And as far as I know, the net bags that	Thank you for your comments.

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		apples and oranges are in are not recyclable, so I keep having to throw those away. Thank you for seeking feedback.	
Peggy Price	Chapter 4 - Recycling	I think we should consider a plastics recycling facility in American soil--preferably in an area that needs jobs. We can't rely on China to do it for us. We should also emphasize in communications to the community the importance of rinsing containers before recycling them. Some people think it isn't necessary.	Thank you for your comment. The division is working with a task force to look at developing local processing and markets, and how to reduce contamination. Results may include a new outreach campaign to educate residents with an emphasis on reducing contamination.
Nick Vichas	Chapter 4 - Recycling	Why doesn't Houston transfer station have metal recycle? Why did the Goverment run the person off across the street that recycled metal? Now guess where all that metal goes? In the dump. Maybe harvest the landfill before closing it.	Thank you for your comments. The Houghton Transfer Station has limited space and not enough room to collect metals. The person that was collecting metals on the street was creating a safety hazard.
Ellen Wood	Chapter 4 - Recycling	In store recycling vending machines like Oregon uses.	Thank you for your comment. The vending machines are used in conjunction with a bottle bill that has been in place in Oregon since 1971. Washington State does not have a bottle bill.
Curtis Thompson	Chapter 4 - Recycling Collection	I/we live in Kirkland in a condominium. Either the City of Kirkland and/or our homeowners are unable and/or unwilling to facilitate recycling in a meaningful way. All mixtures of paper/ cardboard/ glass/ cans/ plastic/ clothing and food waste are routinely dumped into what are supposed to be containers dedicated to specific recyclables or landfill. We have no means whatsoever to store/transport/process compostable wastes. We need meaningful and very assertive incentive/ accountability at the municipal and homeowner levels that are enabled with the appropriate resources. I doubt our homeowner board will attempt to hold owners responsible for proper recycling behavior unless there are substantial financial consequences. I am sure we are not alone.	Thank you for your comment. Your comment has been shared with the City of Kirkland recycling staff for follow up with you.

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Clyde Hill	Chapter 4 - Recycling Rates – Goals and Targets. Pages 4-3 to 4-7	An overall long-term target of 70% is established for the county. In 2014, the overall rate for the county was 52%. It is suggested that the following information be included in the Plan. 1. Provide additional historical recycling rates covering as many years as possible. 2. Provide forecasted recycling rates used to adjust the baseline forecast (see comments on Chapter 3 above).	Additional years have been added to Figure 4-2 to give more historical context. The Forecasting section has been edited to describe the forecasting inputs and process to the forecast more clearly.
Zero Waste Vashon	Chapter 4 - *Reusing resources p. 4-12*	Vashon island would be an ideal location for a ReUse facility.	Thank you for your comment.
Zero Waste Vashon	Chapter 4 - Services	Can do more with the facilities and haulers we already have by adding services, simplifying services, and increasing education. Transfer stations - need to offer more services at all transfer stations (for continuity throughout the county) such as Styrofoam, paint, reuse, and electronics recycle. Transfer stations need to be more user friendly so use is encouraged. Haulers – special but regular pickups should be scheduled for problem waste stream items. Hazardous waste – more dangerous and potentially toxic products should be accepted. Hours should be expanded and better advertised.	Thank you for your comment.
Zero Waste Vashon	Chapter 4 - *Single Family Res. Minimum Collection Standards p. 4-28-9*	Great to see mention of exploring including Vashon in the service level standards. Organics collection should be county-wide with distributed compost & ReUse facilities.	SWD is looking into the possibility of organics collection and composting on Vashon Island.
Zero Waste WA	Chapter 4 - Sustainable Materials Management	On Policy - S-5 *Work with regional partners to find the highest value end uses for recycled and composted materials, support market development, and develop circular supply loops to serve production needs* - we would like to see an inclusion of the consideration of toxic chemicals. Unfortunately, there are a number of toxic chemicals in products which should not be returned into new products.	Thank you for your comment. This policy allows consideration of the presence of toxic chemicals in products as circular supply loops are developed.

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Zero Waste WA	Chapter 4 - Sustainable Materials Management	On action 1-s - *Lead by example by improving waste prevention and recycling in public-sector operations, facilities, and at sponsored events, as well as through the purchase of sustainable products* – the plan should include specific examples such as eliminating the use of single use plastic water bottles at all city or county-sponsored events.	Thank you for your comment. Your suggestions have been added to the Plan
Zero Waste WA	Chapter 4 - Sustainable Materials Management	On Action 7-3 - *Provide technical assistance and promote proper deconstruction, building reuse, and reuse of building materials* – as well as the other actions related to C & D, we would like to see stronger actions, including requiring deconstruction of old homes, similar to Portland, Oregon's law.	Thank you for your comment.
Zero Waste Vashon	Chapter 4 - *Sustainable Materials Management p. 4-1*	Vashon Island, Skykomish & Snoqualmie Pass should each have curbside organic collection with a local compost facility to save transport costs & energy and divert valuable materials from the landfill.	The City of Skykomish provides curbside garbage pickup within its city limits and no curbside collection is provided for the Snoqualmie Pass area. The population density is not great enough to make curbside collection of organics or a compost facility economical. SWD is looking into the possibility of curbside organics collection and composting on Vashon Island
Zero Waste Vashon	Chapter 4 - *Table 4-4. P. 4-23*	The data for Vashon Island have changed. We no longer have a 4 bin system, but have a 96 gallon cart and the 7% recycling rate seems too low.	The information on Table 4-4 has been updated.
Zero Waste Vashon	Chapter 4 - Waste prevention goals and targets p 4-5	Increased organics processing and compost facilities should be added to this!	The amount of yard waste collected and composted is included in the targets.
Cordelia Scheuermann	Chapter 4 - Waste Reduction	Thanks for what you do! Having traveled to places in the world without adequate waste management I am very grateful for the level of cleanliness and safety that we have. OUR part as citizens is to reduce the amount of waste we produce so your job does not become impossible as our population increases and China reduces the amount of our waste they are willing to take off our hands!	Thank you for your comment and commitment to waste reduction.

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Laurie Dumouchel	Chapter 4 - Waste Reduction	I am unable to attend public hearings, however, I have watched the four videos and found no plans for the reduction of non recyclable garbage. For example: • Replacement of plastic bags for containing animal waste, household garbage and for multiple commercial uses. • Research alternatives for all other non-recyclable waste products. • Disposal of products when recycling life has ended. • Increasing uses and markets for recyclables	Thank you for your comment. The videos that are posted on-line are a brief summary of what is discussed in the draft Plan. Several policies and actions in the Plan address your concerns (e.g. Policies S-1 through S-6 and Actions 4-s, 8-s, and 18-s).
Tyson Fritch	Chapter 4 - Waste Reduction	My name is Tyson Fritch. I live in Snohomish County but work in Woodinville, in King County. I was reading the Woodinville Weekly the other day and there was an article titled "Council gets the lowdown on waste". In it you had explained that "70% of what goes to the landfill doesn't belong there" and that "sorting doesn't always work". Then you say initiatives will be more achievable by encouraging manufacturers to use more sustainable materials. The article goes on to say that the three major options that are being contemplated are building a new facility, developing the existing facility at Cedar Hills, or exporting the waste by rail to an out-of-county landfill. What I'm writing you to say is that while I think using sustainable materials is a step in the right direction, I think there should be a bigger push to consume less altogether. We as a society have become complacent when it comes to how much we consume. It has become too easy to buy something that will become useless within a few months, then throw it away. There isn't any accountability when we are able to throw something away and maintain an "out of sight, out of mind" mentality. In the article I think you had mentioned that more education on what can be recycled or composted is in order, which I agree with. But it doesn't consider the fact that we are conditioned to being able to	Thank you for your comment.

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		get whatever we want, whenever we want it. That cool 90's Troll doll that everyone had? Sure, hop on Amazon, order one that is most definitely made in China, shipped to the U.S. on container ships whose exhaust and waste are mostly unregulated, so Amazon can put it in a cardboard box with plastic bubble wrapping with shipping labels and adhesive tape, then someone can drive it to your doorstep where you can scratch that nostalgia itch for a few weeks. Then all of it goes in the trash. Kind of a long example but I wanted to paint the picture of how much needless waste is created. So while I think sustainable materials and proper education of how to dispose of our waste is a great idea, I think the more beneficial idea is to move away from consuming so much needless things. The need for a new waste facility or developing the existing facility or shipping the waste to a different facility are all inevitable, but perhaps we can delay the need for them by shifting away from a consumerist society. And let's face it, manufacturers are only going to shift to a sustainable packaging if it's cost effective to do so. But like you had mentioned, what we can do is educate the public on how to appropriately separate their waste and which facilities to bring which materials to (I have to lie and say I am a Bothell resident to recycle styrofoam at the Recology store in Canyon Park. Sorry.) Maybe we can couple this education with some sort of anti-waste agenda, because after all, recycling requires the creation of waste. I know I didn't offer much in the way of solutions to our problems, but waste accumulation is something I've been thinking more about lately and one person can only reach so many people around them. Thank you for your time and have a great day.	
Zero Waste Vashon	Chapter 4 - *What do I do with...? P. 4-13*	In addition to the mothership version, each local rural community (such as Vashon Island) should have their own custom evergreen webpage.	The What do I do with...? application was recently rebuilt to modern standards including location awareness, so that search results appear by distance

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			from the customer. At this time, SWD has no plans to reorganize What do I do with...? to provide static webpages for rural communities in addition to the dynamic, resizing, location-aware application.
Zero Waste Vashon	Chapter 4 - *What is your recycling rate? P. 4-7*	As we lack state & national standards, why don't we establish our own criteria and track them?	The County has established its own criteria and tracks it. We track the known amount of materials that are diverted from the Cedar Hills Landfill, as is explained on page 4-7.
Impact Bioenergy (Jan Allen)	Chapter 4 Sustainable Materials Management:	In this section we recommend you add the following text: King County has an opportunity to offer innovation partnerships with the private sector by offering planning assistance, coordination with transfer stations, public education, and grant support for innovative demonstration projects that focus on the county's priorities. For example, community-scale anaerobic digestion represents an opportunity to manage organic waste onsite, or in community neighborhoods by converting that waste into both renewable energy and liquid soil amendment with zero waste with a high level of vector and odor control. The amendment has nutrients, water, organic matter and probiotics for supporting healthy chemical free soil and food production. Rarely does an opportunity come along that can touch on energy, water, air, soil, food, jobs, and education simultaneously. This one does.	Thank you for your suggested edits. Changes have been made to the discussion on anaerobic digestion in Chapter 5.
Greater Maple Valley UAC	Chapter 4, Goal	We support this goal and the highest priority: a. Waste prevention and reuse.	Thank you for your comment.
Bothell	Chapter 4, pg 4-22	We are requesting you edit Pages 4-22 to include Waste Management as the second solid waste hauler in the City of Bothell. The "f' notation is correct noting we switched haulers with a contract in 2015. Due to recent annexations, Waste Management is still providing collection services in portions of Bothell necessitating the need to add them to the list.	The requested edits have been made.

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Greater Maple Valley UAC	Chapter 4, Policy S-2 and Actions 2-s, 3-s, and 28-s	We support the use of educational methods to produce more informed consumers and producers of solid waste.	Thank you for your comment.
Greater Maple Valley UAC	Chapter 5	The trends of more and better use of Transfer Stations are encouraging as less tonnage is going to the Cedar Hills Landfill. Each of these facilities must be designed, constructed, and operated to ensure safe and convenient means for encouraging maximum recycling for private users.	Thank you for your comment
Impact Bioenergy (Srirup Kumar)	Chapter 5	"The 2015 King County Strategic Climate Action Plan (King County 2015) provides "one-stop-shopping" for county decision-makers, employees, and the general public to learn about the county's most critical climate change actions," however marginal abatement cost curve net-negative carbon emission credit resulting from decentralized AD activities, at a net-negative cost (e.g. profit). That is, local economies can benefit tremendously while at the same time drastically lowering the carbon footprint of the organic waste infrastructure. 2,050 square miles covered in King County by 8 transfer stations is on avg. ~256 square miles per transfer station. Current infrastructure present tremendous opportunity to avoid ton-miles, subtract methane emissions and clean transportation energy for dirty.	Thank you for your comment. A de-centralized system for some materials may be a solution to be explored for some areas.
Kirkland	Chapter 5	The Kirkland City Council has been consistent and resolute in its support for the siting and construction of a Northeast Recycling and Transfer Station (NERTS) to replace the Houghton Transfer Station. The Houghton Transfer Station has served our community well by keeping our disposal rates low and by offering a convenient, local disposal option and basic recycling services to our residents and businesses. However, it has been established, without question, that the station is outdated and fails to meet most of the level-of-service criteria in the 2006 Transfer System Plan. It is incompatible with surrounding land use and lacks modern	Thank you for your comment and your generous offer to host a new recycling and transfer facility. Any siting process will include a variety of stakeholders, including cities.

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		operational efficiencies and recycling amenities found at newer transfer facilities such as Shoreline, Bow Lake, and Factoria that serve to support our region's sustainability and equity goals. While constructing a new NERTS is the most capital intensive of the three transfer options in the Plan, it is clearly the most equitable, efficient, and environmentally responsible alternative that would provide a level of service to the residents and businesses in the northeast County equal to the levels of service provided in other parts of the County. As such, we strongly support the option to site and build a new NERTS and would welcome the opportunity to participate in a siting process with our fellow municipal and County stakeholders. Kirkland would welcome the opportunity to be considered as the host city for a properly mitigated new NERTS and participate in an open and transparent public engagement siting process that includes collaboration with the County and stakeholders on the development of a set of siting criteria that recognize the specific and unique needs of cities and their constituents living and working in the northeast County.	
Kirkland	Chapter 5	We would like to suggest the Plan recognize, and demonstrate with a map, the cities that host private solid waste and recycling facilities, such as the Waste Management Cascade Recycling Center in Woodinville or the Republic Services transfer station in Renton. Private transfer and processing facilities, while not identified as essential, are critical to the overall operation of the solid waste transfer system, but also have traffic, litter, noise, and odor impacts similar to King County's public facilities – negative aspects and costs that are often unrecognized, but are nonetheless borne, by host cities.	Thank you for your comment. Figure 2-4, in Chapter 2, is a map that shows the location of these facilities. We have also added compost and construction and demolition facilities locations to this map.
Maple Valley	Chapter 5	We recommend building a new northeast recycling and transfer station and closing Houghton. Houghton fails the majority of service level criteria for urban stations. A new	Thank you for your comment. The Plan includes a recommendation to build a new NE Recycling and

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		northeast recycling and transfer facility will provide regional equity of solid waste services in the growing northeast area.	Transfer Station. The Houghton Transfer Station would be closed once the new station opens.
Newcastle	Chapter 5	The City has particular concerns over the planned closure of the Renton Station and the potential closing and/or replacement of the Houghton Station. With these closures, Factoria becomes the practical and designated station for Newcastle; however, the Plan does not recognize Newcastle as being part of the Northeast Service Area. Newcastle should be formally added to the Northeast Service Area and be planned for accordingly.	Newcastle's concern over service availability if the Renton and Houghton stations close is noted. Newcastle's needs will be part of Northeast transfer capacity planning and stakeholder involvement
Newcastle	Chapter 5	The new Factoria Transfer station has better facilities than Renton Transfer Station, which will attract more traffic to the already overburdened Factoria/Coal Creek/I-405 interchange area. In addition, when the Renton Station closes all of Newcastle's haulers, along with other areas of north Renton and the southeast, will be redirected to the Factoria Transfer Station. This is particularly concerning to Newcastle because as bad as it is on I-405, most haulers in our area will choose Coal Creek Parkway as the alternative route to and from Factoria. While Newcastle has designated Coal Creek Parkway a principle arterial intended to connect larger communities, it was not anticipated the road would be used for heavy commercial vehicles. We are therefore concerned over the impact that increased use of Coal Creek Parkway by commercial haulers will have on its pavement life. When KCSW evaluated traffic at the Factoria Station, it only looked at backups on Richards Road caused by long wait lines to the station. It did not look at the additional traffic burdens on Factoria Boulevard going to I-405 (passing through a main commercial/residential area with a high school and churches). This is the main route for all KCSW trucks going to/from the station. Moreover, it is the main	The decision about whether to keep Renton open or to close it has not yet been made. Action 2-t in the Draft Plan says that evaluation will happen after new urban transfer stations have been sited and the impact of closure has been fully evaluated. Traffic concerns would be a part of the evaluation of the station. The action has been revised to replace "sited" with "completed".

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		route for future haulers going to the station via Coal Creek Parkway/Factoria Blvd. when the Renton station closes.	
Newcastle	Chapter 5	When the Renton station closes, costs to haulers will increase with the greater congestion-related turn-around time associated with taking loads to the Factoria Station. Newcastle is in process of updating its hauler contract and without some assurance of our primary transfer station destination for the next 10 years, Newcastle cannot assure its customers of reasonable hauler rates.	The decision about whether to keep Renton open or to close it has not yet been made.
Redmond	Chapter 5	Redmond supports the proposal to convene a committee of Northeast Cities to establish service and capacity needs in Northeast King County. Having the committee work together to decide which transfer capacity option is best for our portion of the solid waste system service area is important to our community.	Thank you for your comment. The Plan includes a recommendation to build a new NE Recycling and Transfer Station. A process to involve cities and other stakeholders in the siting process will be developed in consultation with northeast cities. The Houghton Transfer Station would be closed once the new station opens.
Woodinville	Chapter 5	Woodinville acknowledges and appreciates that KCSWD must prepare a comprehensive solid waste management plan that accommodates the projected residential and commercial growth of the region. The City also supports thinking long-term about the costs and financing of the solid waste transfer system that will support this projected growth. In addition, Woodinville acknowledges the need for balancing several important factors related to solid waste—such as maintaining reasonable fees for customers, protecting natural resources through environmental stewardship, and promoting system equity. In this regard, Woodinville supports a solid waste system that provides convenient access for all customers in the service area without becoming a disproportionate burden on any particular community. To date, Woodinville has managed to balance existing waste handling with community needs, such as limiting vehicular traffic, and maintaining Woodinville's beautiful natural open spaces. However, the City is	Thank you for your comment. The Plan includes a recommendation to build a new NE Recycling and Transfer Station. A process to involve cities and other stakeholders in the siting process will be developed in consultation with northeast cities. The Houghton Transfer Station would be closed once the new station opens.

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		concerned that siting additional waste handling facilities like those being discussed may have significant impacts on City residents and threaten the City's ability to adequately maintain this balance.	
Woodinville	Chapter 5	Turning next to the Comp Plan's recommended actions on the transfer of solid waste, Woodinville is particularly interested in action 1-t as it applies to planning for adequate transfer capacity in the Northeast service area. Woodinville understands that demand management strategies cannot substitute for a transfer station in the Northeast service area because certain circumstances, such as Bellevue's participation in the system, have changed since that option was first evaluated. With respect to the remaining three options for providing transfer capacity, Woodinville requests to be involved in the decision-making process. As Woodinville understands them, the three options include: (1) continuing operations at the Houghton Transfer Station (which corresponds with "Alternative 1" Solid Waste Transfer and Processing System Facility Improvements in the EIS at 1-5); (2) building a new transfer station in the Northeast service area; and (3) building several smaller transfer sites in the Northeast service area (these last two options appear to be different variations of "Alternative 3" in the EIS at 1-7). The Comp Plan states that "an advisory committee composed of Northeast service area residents, city, and business representatives would be formed to develop siting criteria that would guide the site selection process," a practice that the Comp Plan indicates is consistent with King County's Solid Waste Facility Siting Plan (hereinafter "the Siting Plan") (Comp Plan at 5-19). The Siting Plan states that "[c]itizen advisory committees shall be used to reflect the values of host communities as an effective means of weighting criteria" (Siting Plan at C-17). Based on the Comp Plan, the Northeast service area	A process to involve cities and other stakeholders in the siting process will be developed in consultation with northeast cities. One on one discussions between the division and potentially affected cities also will be part of the project scoping and decision making process. The division will adapt involvement approaches used for previous transfer station projects to the needs of the northwest service area.

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		includes the cities of Woodinville, Kenmore, Kirkland, and Redmond, and parts of Bellevue, Bothell, and unincorporated King County (Comp Plan at 5- 19). One point on which Woodinville seeks clarification is whether the list of Northeast service area municipalities in the Comp Plan is exhaustive and whether all of those entities will be represented in the decision-making process via the advisory committee or some other vehicle. As noted earlier, Woodinville requests to be a part of the siting process and is committed to remaining engaged throughout the decision-making process.	
Woodinville	Chapter 5	Another point on which Woodinville would appreciate clarification is the data underlying Table 5-4 (Comp Plan at 5-20). Although the percentage of a jurisdiction's transactions through Houghton Transfer Station is relevant to understanding use of that station, Woodinville would like to obtain the data on the actual tonnage and number of truck trips generated by each jurisdiction's use of Houghton. Moreover, Table 5-4 does not list all of the jurisdictions provided for in the Comp Plan as comprising the Northeast service area; transactions from Kenmore, Bellevue, and unincorporated King County are not listed (Comp Plan at 5-20).	Table 5-4 was removed from the Plan.
Woodinville	Chapter 5	According to the Comp Plan, transfer capacity in the Northeast area will be "allocated equitably among jurisdictions" (Comp Plan at 5-21). Those transfer station site options that are geographically distant from existing waste handling and disposal facilities should be preferred over those site options that are in close proximity to existing facilities (*see* Siting Plan at C-15, C-16). And, relatedly, Woodinville's support of the Cascade Recycling Center, the Brightwater Wastewater Treatment Plant, and the DTG Recycling Group should be taken into consideration. If the County intends to build a new Northeast transfer station, the	Thank you for your comment.

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		KCSWD would go through the siting process and conduct a separate EIS. The current EIS draft associated with the Comp Plan does not yet address the specific impacts of Northeast sites because no sites have yet been identified. Woodinville seeks to be an active participant in the site identification and screening process if the County goes forward with either of the two alternatives involving the construction of new facilities in the Northeast. Based upon the analysis completed in the EIS, the best alternative may be to continue use of the Houghton transfer station, and along those lines, ensure full utilization of all existing and possibly underutilized transfer stations to avoid the need to construct new facilities. Creating a new Northeast transfer station would result in a loss of vegetation and wildlife habitat, would produce CO2 emissions from construction and operation, would impact noise and transportation during construction, and involve high capital costs (EIS at 1-7 to 1-10). Additionally, maintaining Houghton is the lowest cost option in terms of capital and operating costs (Comp Plan 5-22). Regardless of which alternative the county pursues, Woodinville seeks to provide ongoing input because appropriate mitigation of impacts on cities is important to regional equity.	
Seattle-Tacoma International Airport (Port of Seattle)	Chapter 5	Consider extending Bow Lake Transfer Station Operating hours to full 24 hours/day, seven days/week, 365 days/year year-round or seasonally to accommodate SEA's anticipated peak- season hauling needs. Recent SEA growth and corresponding waste generation combined with solid waste collection and storage constraints have meant that even brief weekend or nighttime closures at Bow Lake prevent optimal waste hauling schedules, and contribute to temporary capacity challenges at SEA.	Thank you for your comment.
Sara Thomas	Chapter 5 - Odors	I am resident of 98059 and the Maple Hills community. It is extremely important to me that the new plan for solid waste	Thank you for your comment. The Plan and EIS text have been revised to include a discussion of existing

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		clearly addresses odor concerns and is more comprehensive and impactful than the current application of our clean air laws. Our neighborhood can be plagued by odors both by Cedar Hills landfill and Cedar Grove composting. Clear violations from both facilities are detrimental to our neighborhood, families, and property values. It's crucial that this is addressed in any revision of plans moving forward. With increased demand on Cedar Hills and plans to look for areas of potential expansion, please ensure that this is addressed so other communities don't have to experience the same issues. Of course the waste needs to go somewhere and there is no perfect solution but please enforce facilities to manage odors effectively.	odor impacts in communities containing commercial-scale composting operations.
Zero Waste Vashon	Chapter 5 - Advanced Material Recovery p 5-31	Success here starts by offering more services at our transfer stations.	Thank you for your comment
Zero Waste Vashon	Chapter 5 - Anaerobic Digestion p 5-31	AD technology is standard in Europe and Asia to properly process food waste. ZWV believes this is one of multiple technologies (compost, reuse, biochar production are others) that when coupled together complement each other while doing a better job processing the full spectrum of waste. We are excited to get an anaerobic digester on island this year to process pre-consumer food waste, and hope to couple it with an aerobic compost facility soon!	Thank you for your comment.
Kevin Jones	Chapter 5 - Composting	A yard waste recycle facility should be established on Vashon to avoid cost and environmental damage of trucking Vashon yard waste to Cedar Hills	Thank you for your comment. SWD is analyzing organics processing on Vashon as an option to more sustainably manage this material. Issues such as space, configuration, safety, cost etc. are some of the factors that must be looked at closely to determine if it is a feasible alternative

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Puget Sound Clean Air Agency	Chapter 5 - Composting/ Air quality	Thank you for the opportunity to provide comments on the King County Draft Solid Waste Management Plan (Draft SWMP) and related Draft Environmental Impact Statement (DEIS). We are focusing our comments on the air quality impacts of the current and proposed alternatives for operations by King County Solid Waste Division (KCSWD) and its contractors. Specifically, we are interested that the air impacts related to organics processing and recycling (also referred to as "composting" in this letter) be adequately identified and considered. The Draft SWMP and DEIS discuss the current level of organics recycling, estimated at 52% in 2014 and identify various alternatives that would increase that to a goal of 70%. The air quality analysis in the DEIS discusses a variety of general air quality issues on this topic, but does not clearly acknowledge (or discuss) the existing odor impact conditions in communities with composting operations. The summary for Alternative I (No Action) states the impact of this choice would be increased greenhouse gas emissions and higher disposal costs, both as a result of not increasing the recycling rate. It also states that the existing organics recycling capacity is unknown, but that increasing to a rate of 70% will require more facilities and/or capacity. As the primary recipient of odor complaints for King, Kitsap, Pierce and Snohomish Counties, our agency has a comprehensive understanding of the impacts current composting operations have on surrounding communities, and they are significant. In 2017, the Agency received approximately 4,010 complaints related to odor. Of those, approximately 2,500 were directly related to the composting facility in Maple Valley. Over the past 10 years, nearly half of all odor complaints received were related to the Maple Valley facility, and more odor	Thank you for your comment. The Plan and EIS text have been revised to include a discussion of existing odor impacts in communities containing commercial-scale composting operations.

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		complaints were received in response to the composting operations in Maple Valley and Everett than all other sources of odor in our four county jurisdictions combined.	
Puget Sound Clean Air Agency	Chapter 5 - Composting/ Air quality	Based on the feedback we receive from the public, we believe that these existing conditions have not been adequately identified or evaluated in the DEIS and will be an impediment to additional recycling because communities will not have the confidence that impacts will be properly mitigated. On page 5-30 of the Draft SWMP, the County speaks to these issues indirectly. Specifically, it states: • More capacity will be needed to recycle more as the existing facilities may be near their maximum permitted capacities (p. 5-30, ¶2) • Regional composting facilities were designed for yard waste, not the mix of food, yard and compostable packaging that is collected and processed today. There exists a need for upgraded technology to manage the new material mix (p. 5-30, ¶2, 2nd bullet) • Financing for technology upgrades at existing facilities (p. 5-30, ¶4, 4th bullet) Some of these observations were identified as needed to maintain the quality of the finished product. We do not have specific information to comment on the existing capacity in the market for organics recycling, but it is likely that the existing facilities are at or beyond their capacity, especially when you consider the short-term processing rates they can manage. The throughput at these facilities varies seasonally for reasons beyond their control. The comment above regarding the original design for yard waste is apt. Recent research has indicated that increasing the food waste portion to 15% of the total waste stream (food and yard waste combined) can double the organic emission rate from composting operations, meaning that more food recycled leads to more organic emissions which contributes	The Plan and EIS text have been revised to include a discussion of existing odor impacts in communities containing commercial-scale composting operations, and to discuss the potential for increased odor impacts as a result of increased recycling and subsequent composting of organics.

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		to an increase in odorous emissions. These increased odor impacts also have not been adequately identified or evaluated.	
Puget Sound Clean Air Agency	Chapter 5 - Composting/ Air quality	Consequently, we request that the DEIS be revised as follows: 1. Revise the Summary (Chapter 1.2/Tables S) and Chapters 3-5 to include: a description and discussion of existing conditions (in 2017-2018) in communities surrounding composting facilities in the County (and facilities used by the County for organics recycling), and identification of odor impacts caused by existing conditions so that all alternatives and impacts can be evaluated adequately against existing conditions. 2. Revise all subsequent discussions of alternatives and impacts in the Summary (Chapter 1.2/Tables S) and Chapters 3-5 to account for, as needed, the updated description and discussion of existing conditions per item (1) above. 3. Revise Chapters 3-5 to identify and evaluate odor impacts from the proposed increased rates and types of recycling for each alternative (and revise the conclusions reached related to such impacts in 3.2.2.3, 4.2.2.3, 4.4.2.3 and 5.2.2.3 as needed). 4. Revise Chapters 3-5 to include and evaluate specific, reasonable mitigation measures for the odor impacts to be caused by each alternative and describe the mitigation measures that the County is willing to commit to implement to address the odor impacts that will be experienced in the communities for each alternative. The Draft SWMP should then be revised accordingly based upon the revised information and analyses included in the revised DEIS.	The Plan and EIS text have been revised to include expanded discussions of odor impacts associated with existing commercial-scale composting facilities, potential odor impacts resulting from increased organics recycling and composting, and measures to mitigate potential odor impacts.

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Puget Sound Clean Air Agency	Chapter 5 - Composting/ Air quality	In addition, it is important to note in the Draft SWMP and DEIS that capacity factors alone will not address the existing environment for odor impacts. The Draft SWMP and DEIS do not identify what future mitigation may be appropriate for future composting facilities or expanded capacities at existing composting facilities. While some specific mitigation will also be considered in future review of specific proposals, as requested above in (4), the County should now identify in the Draft SWMP and DEIS reasonable mitigation measures for odor impacts and what mitigation the County is willing to commit to implement to address the odor impacts that will be experienced in the communities for each alternative it is considering.	The Plan and EIS text have been revised to include specific measures that could be implemented to mitigate potential odor impacts resulting from composting of recycled organics.
Puget Sound Clean Air Agency	Chapter 5 - Composting/ Air quality	The Draft SWMP plan also indicates in order to expand organics recycling, *"....a regional dialogue with exploration of alternatives and solutions for expanding capacity is necessary. This will help minimize environmental and community impacts related to regional organics process and ensure an adequate capacity and infrastructure is in place for regional organics processing, including contingency plans in the event regional capacity is constrained." (p. 5-30,* if *3).* This Agency supports that regional discussion "If it includes the existing facilities and systems as part of the discussion. This discussion should wide ranging in scope, and should include considerations of existing conditions and circumstances, best practices for facilities, capacity (present and future) and future needs. As an example, we believe it is reasonable to expect that an organics recycling operation can operate with no more impact on its community than a landfill, transfer station, or wastewater treatment plant. As utility provided service operations, composting is a part of that service model.	Thank you for your comment and support of a regional discussion.
Zero Waste Vashon	Chapter 5 - Emerging Process Technologies p 5-31	This is an extremely limited list of what KC SW should be exploring. Recognize advanced technologies to deal with subjects addressed in these comments. Include Biochar	Thank you for your comment. The information provided is not intended to be exhaustive, but

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		production, algae growth as a feedstock and to process CO2, and aerobic digestion (AD) to process/purify water are technologies that at least should be recognized in this section.	rather an example of emerging technologies that could be explored.
April Atwood	Chapter 5 - Figure 5-3	I was looking at the comp plan draft and noticed that fig. 5.3 seems to have the wrong colors for the 'transactions' part of the image?	Thank you for your comment. Figure 5-3 has been corrected.
Jodie Galvin	Chapter 5 - General	Thanks for offering an opportunity to submit comments. I would love to see a facility that can process compostable diapers. There are a number of compostable brands now and there are services in the Bay Area, New York and Canada that offer this service. It's time to bring it to the PNW!	Thank you for your comment.
Washington Department of Agriculture	Chapter 5 - General	The Washington State Department of Agriculture (WSDA) reviewed King County's Draft Solid Waste Management Plan (SWMP). Our staff has determined that the draft SWMP is in compliance with state plant pest and disease quarantines as described in Chapter 16-470 WAC. We reviewed the waste management plan with particular emphasis to the state's apple maggot quarantine, described in Chapter 16-470-101 WAC. The transport of municipal green waste and municipal solid waste from the apple maggot quarantine area to the pest free area is prohibited without a WSDA special permit. WSDA will not require King County to have a special permit to ship municipal solid waste or green waste. However, if the conditions contained in the SWMP change and you have questions about whether King County is in compliance with the apple maggot quarantine rule please do not hesitate to contact me or WSDA Pest Program staff. Thank you for providing our agency with the opportunity to comment on the King County Solid Waste Management Plan. RCW 70.95.096 requires the Washington State Department of Agriculture to review solid waste permit	Thank you for your review of the Draft Comprehensive Solid Waste Management Plan.

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		applications for any increased risks of introducing a quarantine plant pest or disease into a pest free area.	
Impact Bioenergy (Srirup Kumar)	Chapter 5 - p. 161 (5-31)	It should be mentioned that Impact Bioenergy has 6 microdigesters deployed in the northwest, 4 of which are in King County: Seattle, Redmond, Carnation and Auburn (pictured below –(**please, can the Fremont Brewing picture in the draft plan be replaced with these? – see comment form)**	Thank you for the photos. The photo of the Fremont Brewing digester has been replaced and mention of the microdigester locations added.
Clyde Hill	Chapter 5 – pg 5-16	Much of this section includes information on recent substantive issues some of which are in the process of resolution. They include a commitment by Solid Waste to build a second northeast transfer station, agreement that the demand management pilot would be cancelled, agreement by Bellevue and each of the "four Points communities" to sign the "Amended and Restated Solid Waste Interlocal Agreement" (a defined term in the Comprehensive Plan) under the same terms and conditions as prior signers to this agreement, and updates on the potential closing of existing facilities. There is concern that since this document is named "2019 Solid Waste Comprehensive Plan" that future readers will assume that the document is factually more current than it actually is (particularly for the year 2017).	Thank you for your comment. The name of the current document is the 2019 Comprehensive Solid Waste Management Plan with a date on the cover of July 2018. 2019 reflects the expected approval date while July 2018 is the transmittal date to the county council. The most recent data available were included in the current document.
Zero Waste Vashon	Chapter 5 - Policies	Should include data collection documenting volumes of a variety of materials. Many transfer stations are ideal locations for Compost and Re-Use facilities due to proximity of feedstocks.	Chapter 3 policies are related to collecting data (see policies FD-1-4) Most of our transfer stations have space constraints that would limit co-locating a compost facility or Re-Use facility.
Zero Waste Vashon	Chapter 5 - *Processing Organics p. 5-30*	This section should be expanded with recent data, and list the few compost facilities in the county & nearby besides Cedar Grove. If we need more capacity, why not try some field trials such as on Vashon Island?	Compost facilities have been added to Figure 2-4. A new table is also added to Chapter 5 that includes how much material is handled at compost facilities.
John Olson	Chapter 5 - Recycling at transfer stations	Please add "all-in-one" recycle containers at all transfer stations- thank you	Thank you for your comment.
Olympic Environmental	Chapter 5 - Recycling Collection Events	In the recent draft update to the King County Solid Waste Comp Plan, it is suggested that residential recycling collection	Thank you for your comment

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Resources (Paul Devine)		events be phased out. Olympic Environmental Resources provides management of residential recycling collection events for many cities in King County. Residential recycling collection events have been successful at working towards King County's goals of reducing waste and recycling. The events have been a stable and consistent service that has removed many millions of pounds of material from the waste stream and served hundreds of thousands of King County residents. In the nearly three decades that events have been in place, residential recycling collection events continue to accomplish the following: • Been a stable and consistent service that has removed millions of pounds of material from the King County waste stream which can be easily tracked for program results. • Providing for the collection of hard to recycle items. • Provide a successful opportunity for King County and county cities to work together towards a common goal. • Reduce the instance of illegal dumping, particularly in rural areas of King County. • Provide an opportunity to recycle bulky items that would likely end up at transfer stations, thus reducing transfer station "self-haul" traffic. • Used in King County cities as a way to clean up unsightly residential locations by providing a location for residents to dispose of those items. • In bad commodities markets (like the current state of scrap metal and used oil), recycling collection events have filled a needed service where the private sector has reduced or eliminated service.	

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		• Provide residents with educational materials on new programs and other recycling programs they may not know about without coming to events. • Provide opportunities to survey residents on new or existing City programs. • Provide residents with environmentally friendly products, like worm and compost bins for organics recycling and rain barrel for water conservation. These items are typically produced with recycled materials which in turn helps support the recycling industry. • Enhance goodwill to City residents by providing a needed direct government service. • Support the local recycling economy which provides jobs to many King County residents. King County has spent decades providing residential recycling collection event service. A well-established system is in place that is rarely duplicated in Washington State outside King County or in other areas around the United States. Reducing or eliminating residential recycling collection events would be a step in the wrong direction and reverse the positive effects of the events listed above.	
Auburn	Chapter 5 - Transfer	The City of Auburn is looking forward to having access to a modern transfer station in the next few years and encourages the SWD to continue its equitable solid waste system when determining the future of the transfer system in the Northeast portion of King County	Thank you for your comment. The Plan includes a recommendation to build a new NE Recycling and Transfer Station. A process to involve cities and other stakeholders in the siting process will be developed in consultation with northeast cities. The Houghton Transfer Station would be closed once the new station opens.
Bellevue	Chapter 5 - Transfer	After identifying and comparing the transfer options in Chapter 5, the Plan should identify a recommended or preferred alternative to site and build a new northeast recycling and transfer station. This option is most consistent with both Bellevue's expectations in signing	Thank you for your comment. The Plan includes a recommendation to build a new NE Recycling and Transfer Station. A process to involve cities and other stakeholders in the siting process will be developed in consultation with northeast cities.

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		the ILA and the intent of King County Ordinance 2017-0323 and King County Motion 2017-0405. This transfer option provides the most efficient and equitable transfer system for northeast King County. *Requested change (p.5-24): Select transfer option 2 to "site and build a new northeast recycling and transfer station" as the preferred transfer alternative.*	The Houghton Transfer Station would be closed once the new station opens.
Bothell	Chapter 5 - Transfer	The City of Bothell is supportive of siting a Transfer Station in the Northeast portion of the County. We believe this provides our residents with an equitable solution that best serves our area. Residents in Bothell are paying for stations being built in other parts of King County and therefore should receive an equal level of service. This is especially important when we consider the growth that is anticipated in this geographical area of the County. It would also be easier for residents and businesses if the list of accepted items was consistent for each station.	Thank you for your comment. The Plan includes a recommendation to build a new NE Recycling and Transfer Station. A process to involve cities and other stakeholders in the siting process will be developed in consultation with northeast cities. The Houghton Transfer Station would be closed once the new station opens.
Tony Muro	Chapter 5 - Transfer	I am in favor of keeping the Houghton Transfer Station open	Thank you for your comment. The Plan includes a recommendation to build a new NE Recycling and Transfer Station. A process to involve cities and other stakeholders in the siting process will be developed in consultation with northeast cities. The Houghton Transfer Station would be closed once the new station opens.
Zero Waste Vashon	Chapter 5 - *Vashon Recycling & Transfer Station p. 5-25*	Mention potential compost field trial & ReUse facility pilot programs?	Thank you for your comment.
	Chapter 5 - Vashon Transfer Station	I am a long time Vashon Island resident. I have recycled all my garbage up to the time that you changed the layout at the Vashon Transfer Station. I haul all my stuff in a trailer and there is not enough room to turn around there, you cannot drive up to the recycle bins to unload. I usually have	Thank you for your comment. SWD is evaluating the recycling area at the Vashon Recycling and Transfer Station and may make changes to how the area is configured to maximize the space available.

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		6 cans and only one is garbage which cost me $24.25. Until you change the setup so we can drive along side of the bins, I will continue to take all my aluminum, plastic, papers, a carload and keep dumping them and still only pay $24.25.	
Woodinville	Chapter 5 - Woodinville's Regional Efforts	First and foremost, the City of Woodinville is proud to be regional partners with the other cities and entities within and outside of King County. Despite its relatively small size, Woodinville is home to, or in close proximity to several critical facilities, including the Waste Management Cascade Recycling Center; the Brightwater Wastewater Treatment Plant; DTG Recycling Group; regional trails such as the Burke-Gilman, Sammamish River, and Eastside Rail Corridor; State Route 202; and Northshore Athletic Fields. While Woodinville is honored to play a crucial role in the region, the City has devoted considerable resources to addressing and funding resolution to and mitigation of these facilities. First, the Cascade Recycling Center in Woodinville is the only recycling facility located within the Northeast service area (*see* Comp Plan at 2-9, 5-17). It is the second busiest waste handling facility in Northeast King County, and processes a comparable tonnage of materials to KCSWD's busiest transfer stations, with the exception of Bow Lake (See chart below).[1] As the home of the Cascade Recycling Center, whose service area is vast, Woodinville experiences increased truck traffic, litter and debris, and it requires additional law enforcement activity (Attachment A). Secondly, Woodinville faces the threat of negative impacts from various seismic scenarios related to faults at or near the Brightwater Wastewater Treatment Plant. For example, as noted in the Draft Supplemental EIS on Brightwater, if an earthquake affects Brightwater's water flow storage, overflows can be anticipated at the Woodinville Pump Station (see Draft Supplemental EIS on Brightwater, Figure	Thank you for your comment.

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		5-3). Given Woodinville's existing contributions to waste handling in this region, the City is aware of the importance of mitigating the impacts of waste handling and disposal facilities on the surrounding communities (Attachment B). [1]The Comp Plan refers to the Cascade Recycling Center as a materials recovery facility, which is distinct from a solid waste facility. Nevertheless, it is worth comparing the tonnage of materials being processed in regional facilities in the solid waste system, regardless of whether those materials are recyclables or garbage, because both types of facilities have similar impacts on their host cities. The following Factsheet on the Cascade Recycling Center states that an average of 35 tons of recycling come through hourly: http://wmnorthwest.com/cascaderecycling/gif/factsheet.pdf. Woodinville's conclusion that the Cascade Recycling Center processes more tonnage of materials than almost every transfer station in King County is supported by comparing this Factsheet with the information contained in Table 5-1 of the Comp Plan	
Impact Bioenergy (Srirup Kumar)	Chapter 5 p. 142 Disaster Preparedness (5-12)	Consider the RNG potential of organics for fuel security for the SWD to act "in island mode."	Thank you for your comment.
Federal Way	Chapter 5, pg 5-18	The NE Service Area Transfer Station (NETS) siting process is a significant upcoming process, but if this process begins in a timely manner, some details in this section of the draft Plan may be obsolete before this Plan is adopted. Formatting changes that may increase clarity: First, please move the more generic sections on transfer station siting (and how this was conducted as part of the SKRTS process) to immediately before the NETS discussion to provide context and consistency. Then introduce the (pending) NETS process. The public engagement process should seek the input that will help determine which specific NETS options are most suitable, and a generic outline of this process should be described in the Plan. Add a generic timetable and describe how decisions are reached (for example, based on the level of service criteria) before outlining the basic options.	Thank you for your comment. The Plan includes a recommendation to build a new NE Recycling and Transfer Station. A process to involve cities and other stakeholders in the siting process will be developed in consultation with northeast cities. The Houghton Transfer Station would be closed once the new station opens. Chapter 5 has been edited to distinguish the recommended alternative from the other options that were considered.

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		Describe how the initial siting process will flesh out these basic options in greater detail. Make it clear that other options may be considered (and this Plan is not the siting process). The discussion of the NETS siting process should generically indicate that there are a minimum of three options for the Houghton facility, for example: 1) no action (keep as is), 2) close it and go through the siting process for a modern station, or 3) pair it with another new station to be sited in the general vicinity but have limited level of services at each. Please note drawbacks of the 3rd option: the operating costs for the two 'paired' facilities would exceed the cost of operating a single modern station, and each of the paired sites would fail to meet some service level criteria on their own. The Plan should be edited to clarify how the current facility would remain as is ("no action" alternative) versus distinguishing that from the option outlined under "Cost" (converted to a self-haul only facility); it should be clearer that these are distinct options.	
Federal Way	Chapter 5, pg 5-21	Please correct	The space has been removed in the word County.
Federal Way	Chapter 5, pg 5-22	The discussion of operating cost should be revised. The draft Plan suggests Houghton could remain open as a self-haul station, while a second Station is sited and built, to be dedicated for commercial haulers only. However, this approach would be more expensive to operate than a single modern transfer station (a more cost-effective solution which fits with the typical weekday vs. weekend use patterns for franchised haulers vs. residents/self-haulers). The existing Houghton Station does not meet several Service Level criteria. Please make revisions so that the	The "Operating Costs" section as it is written says that keeping Houghton open and operating "as is" would be less expensive than either a new NERTS or a combination of facilities (including a potential option to keep Houghton as a self-haul only station and building a new commercial facility).

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		Plan does not appear to promote options that fail to meet these criteria yet have higher operating costs. Since County transfer station labor agreements mandate shift and staffing levels, it is not apparent that operating costs "would be lower" for the "existing Houghton Station" plus a "hauler-only station" than the cost of operating a modern, combined station. For example, while "self-hauler" station may receive less tonnage, it will have several times more transactions than a hauler-only station. Labor agreements imply that KCSWD would find it challenging to operate and maintain Houghton transfer station "weekends only" just for self-haulers.	
Federal Way	Chapter 5, pg 5-22	Please revise the language so it uses the text in more recent documents such as the Transfer Plan (KCSWD 2006b) Table 2, and draft 2013 Plan, which both indicate for Houghton: "space exists for station expansion ...inside the property". The new North Seattle station was reconstructed in place, demonstrating the potential for station compatibility in a more dense setting. Constructing the Bow Lake TS involved excavating a former landfill to create space to build the modern facility. A similar approach with appropriate mitigation and latent landfill gas recovery will, by default, be an option when siting any new transfer station, and as such, the Plan should not preclude this option.	The language that is used under the "Level of Service Criteria" is referring to the transfer building and the existing transfer station footprint. While excavating the landfill would be a possibility, it is not discussed in Chapter 5 because the City of Kirkland has expressed an interest in closing the station and locating another station on a different site.
Federal Way	Chapter 5, pg 5-23	It is unclear how the combination of two stations would meet the level of criteria any better than a modern full-service transfer station. While it is possible that 'paired' northeast transfer stations might allow better geographic distribution closer to distinct sets of users in a given area, <u>all</u> service level criteria would be met when siting a single full-service transfer station (as evidenced by the new Bow Lake, Shoreline and Factoria stations). It is unlikely the siting process for a new Northeast station	Thank you for your comment. The Plan includes a recommendation to build a new Northeast Recycling and Transfer Station. The text that you are referring to has been deleted.

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		would lead to selection of a location that does not meet the travel-time criteria for this service area, since that would be the basis of the initial property search. Please edit the text so this is clarified. Please edit this text so it does not imply the preferred approach is to site a "commercial only" transfer station, since operating two distinct urban stations does not appear to provide equitable service or meet all level of service criteria.	
Federal Way	Chapter 5, pg 5-23	This paragraph should be revised to address the potential for a modern transfer station at the Houghton site (in which case the entire menu of recycling options would be designed in). Due to the higher cost of having two separate stations operating as a "pair" or "combination", but lacking all services expected at modern transfer stations, avoid assuming ratepayers will support the "dual" or "paired" station approach. In addition, KCSWD operations and outreach will be complicated by having to train self-haul customers about the difference between these two transfer stations from the other five "urban" stations, including why sets of customers are denied access to a potentially more convenient transfer station.	Thank you for your comment. The text you are referring to has been deleted.
Federal Way	Chapter 5, pg 5-24	Please correct typo	The extra space has been removed.
Federal Way	Chapter 5, pg 5-27	As mentioned earlier, please move the "Siting" and SKRTS section to immediately before the discussion of the long term capacity in the NE Service Area, to provide a preview of the siting process and how it was accomplished most recently. Please cite the comprehensive analysis referenced.	The section has been moved as suggested.
Federal Way	Chapter 5, pg 5-27	The Plan should note that all the modern Transfer Stations have been built at or next to old landfill sites or facility sites, in part due to the challenges of siting	The section has been changed as suggested.

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		these facilities in suburban areas. The Plan should not connote that this fact is a criteria in the site search process, however it is self-evident system-wide, and follows a similar pattern in neighboring systems.	
Federal Way	Chapter 5, pg 5-30	The Plan should outline regicnal organics processing capacity issues/limits and what actions the system can contemplate taking in order to develop additional capacity in conjunction with diversion of more compostables from MSW. Define how processing capacity may need to be expanded in order to meet the anticipated diversion of compostables. The Plan should provide additional information about planning ways to expand organics processing capacity. Examples could include the system exploring the potential for creating its own capacity, or contracting for the development of additional capacity, perhaps at closed areas of Cedar Hills landfill or other KCSWD sites. The Plan should suggest a timeline for discussion/planning, and potential project implementation.	Thank you for your suggested edits. Additions have been made to the discussion on organics processing.
Seattle-Tacoma International Airport (Port of Seattle)	Chapter 5, pg 5-31	SEA enthusiastically encourages King County to explore adding Advanced Materials Recovery (AMR) and processing and Anaerobic Digestion (AD) as possible transfer/processing options at Bow Lake Transfer station. In 2017, despite diverting 3,200 tons of terminal, landside and airfield generated waste, we sent nearly 8,000 tons of MSW to Bow Lake Transfer Station ultimately destined for Cedar Hills Regional Landfill. SEA applauds the County's innovative perspective on AMR and AD options as additional tools to support regional waste diversion efforts. SEA sees these innovative strategies as complimentary services applicable to residual waste following aggressive waste reduction and source-separation initiatives rather than alternatives.	Thank you for your comment.

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Federal Way	Chapter 5, pg. 5-15	This item is duplicated as #6 in the chart above but the note says "not listed." The criteria numbering is different than in Table 2 of the Transfer Plan (KCSWD 2006b), with the criteria **"facility hours meet user demand"** omitted. This may have changed the numbering (and/or the "facility hours" criteria may be added to the list below the chart).	Thank you for your comment. Changes have been made to Table 5-2.
Covington	Chapter 6	Chapter 6 discusses the long- term disposal options associated with the Plan. We would encourage the County to further develop Cedar Hills with the goal of providing disposal to at least 2040. Although we recognize the challenges of each of the options, we feel this is the most cost-effective option at this time and we should maximize the use of the existing facility prior to pursuing other options which will need to be considered in the future.	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity.
Kirkland	Chapter 6	As recently as the mid 2000's, it was anticipated that the Cedar Hills Regional Landfill in Maple Valley would run out of capacity in 2016. Largely through significant improvements in waste reduction and recycling on the part of cities and the County, the life of the landfill has been extended through 2028. The Plan presents three viable future disposal options that could carry the region beyond 2028 and include the further development of Cedar Hills, exporting our waste to an out-of-county landfill, and siting and building a waste-to-energy (WTE) facility. We believe that it is our obligation to our rate-payers to maximize and exhaust the use of our existing resources and infrastructure before considering alternative methods of disposal. While waste export is a relatively affordable, tried and true disposal method in other neighboring jurisdictions such as Seattle and Snohomish County, we believe that it is our responsibility to manage our own waste in our own county and so do not support the waste export alternative. Similarly, while WTE is a popular disposal method in the	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity.

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		United States and Europe, it is prohibitively expensive, requires a dependable stream of waste feedstocks, and comes with myriad of negative environmental impacts. It should not be seriously considered as a reasonable disposal option in this Plan. We believe that the preponderance of the information and data presented in the Plan makes the further development of our landfill the best disposal option when weighed against waste export and incineration.	
Maple Valley	Chapter 6	We recommend the further development of Cedar Hill Regional Landfill to provide disposal of the regions' waste to at least 2040. Extending the life of the landfill is the most cost effective disposal option to keep disposal rates lowest. It provides for local management of the regions' waste, and allows adequate time to fully analyze future disposal options and emerging technologies around waste disposal	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity.
Redmond	Chapter 6	Redmond supports expanding the Cedar Hills landfill to create additional solid waste disposal capacity at least through 2040. We urge King County to continue to explore solid waste disposal options to prepare for post-2040, in addition to expanding Cedar Hills, as planning and implementation of a disposal option that requires construction of an additional facility or disposal outside of the county will require a significant amount of time.	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity.
Woodinville	Chapter 6	KCSWD set out three options in the Comp Plan for long-term solid waste disposal: (1) develop new capacity at Cedar Hills landfill (which corresponds with "Alternative 2" for Landfill Management and Solid Waste Disposal in the EIS); (2) waste export to an out-of-county landfill (which corresponds with "Alternative 1"); and (3) site, build, and operate a waste-to- energy facility (which corresponds with "Alternative 3"). The EIS presents two additional alternatives, both of which would implement emerging recovery technologies (anaerobic digestion and advanced materials recovery), however,	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity.

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		KCSWD admits both have insufficient track records in reliably handling the amount of waste in King County's system (Comp Plan 5- 31; EIS 5-3). Woodinville contends that Option (1) is the best available option based on existing information. One of the advantages of Option (1) is that it is the lowest cost option overall (Comp Plan 6-18; EIS 5-33). Not only is Option (1) more affordable, it also takes advantage of the KCSWD's experience in landfill operation and is consistent with county policy to maximize the life of Cedar Hills landfill (Comp Plan 2-20, 6-6). Yet another reason why Option (1) is the best path forward is that it has the lowest projected greenhouse gas emissions (Comp Plan 6-17). Options (2) and (3) are less desirable than Option (1). As an initial matter, the increased travel distances associated with Option (2) "could result in greater cumulative vehicle emissions and potentially greater long-term air quality impacts" (EIS 1-11, 5-8). Related to this concern, Woodinville requests the specific locations KCSWD is considering sending waste. The EIS states that the out-of-county disposal location would probably be in a rural area of eastern Washington, eastern Oregon, or Idaho (EIS 5-8), and the Comp Plan lists four specific "potential locations" for landfill disposal (6-8). Irrespective of the ultimate destination, however, Option (2) is not an attractive long-term solution because whatever disposal location the exported waste goes to will have a limited lifespan. Option (2) also presents challenges in terms of modifying transfer stations for rail-ready transport (Comp Plan 6-7; EIS 5-1). Moreover, the EIS indicates that rail capacity constraints may "increase the need for capacity increases in the relevant rail corridors" in 2028 (EIS 1-12). According to the Comp Plan, scarce rail capacity "could increase costs and	

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		require robust contingency planning" (Comp Plan 6-10). Rail capacity would also be an issue with Option (3) (Comp Plan 6-10). This rail capacity issue would not arise with Option (1), however, until 2040 (EIS 1-11). Thus, Option (1) would provide policymakers with 12 more years to address rail capacity and to take advantage of waste disposal technology developed in those years. The EIS states that it is currently unknown what intermodal facilities Option (2) would rely upon to export waste but it is likely to be facilities located in south Seattle or south of Seattle near the existing BNSF Railway and Union Pacific Railroad Tracks (EIS 5-26). Woodinville seeks to know if KCSWD is considering any other specific rail lines or facilities for all three options and how many facilities KCSWD anticipates would be required to sustain these options. Another negative effect associated with Option (2) is increased traffic-generating activities at intermodal facilities. Specifically, the EIS estimates that Option (2) could add 156 transfer trailer loads (312 trips) on an average weekday, and approximately 73 transfer trailer loads (146) trips in 2028 on an average weekend day on local roads that provide access to the out-of-county landfill (EIS 5-26). Therefore, Woodinville currently supports Option (1), opposes Option (2), and seeks further information as KCSWD continues to evaluate the three options outlined in the Comp Plan. The City further encourages the County to continue to explore Option (3), a waste-to- energy facility, as a possible long-term solution along with others that promote efficient and effective service with minimal impacts to surrounding communities.	
North Bend	Chapter 6	The City of North Bend supports a waste to energy co-generation facility for the disposal of solid waste in King County. The environmental consequences of continued use	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity.

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		of landfills leaves an environmental problem for future generations and provides a potential exposure to groundwater pollution. Landfills are the subject of controversy for populations located in proximity of the landfill and are guaranteed to face fierce opposition when proposed for continued use, expansion or as new facilities. The energy consumption, wear and tear on roadways, noise and contribution to traffic congestion are all negative impacts of heavy vehicle trucking to landfills. All landfills have a limited life before they run out of capacity. The life-cycle costs of a waste to energy facility as compared to the continued use of landfills demonstrates a greater long-term cost benefit to the citizens of the county. The need to replace traditional energy sources with alternative energy has demonstrable environmental and sustainability benefits. King County has prided itself in the past with providing a leadership role in the national trends toward sustainability. Investing in waste to energy technology would further demonstrate King County's commitment to sustainability and clean energy.	
Celia Parker	Chapter 6	Comment on Chapter 6 Summary of Action 2-d. If we do not • expand existing Cedar Hills Landfill • export waste out of the county • build a waste-to-energy facility (I'm more in favor of this one, caveat problem with containing the heat and exhaust. At least inert (non-toxic) material is produced) What are the alternatives we may suggest?	The options that are identified and discussed are what have been analyzed in the draft Plan. The comment period was an opportunity to comment on these options and/or to suggest other disposal options.
SeaTac	Chapter 6	Using landfill as a means of disposal is unsustainable. It is incredibly short-sighted and needs to end as soon as possible. We should NOT plan for any additional landfill areas, especially not including any costly hauling to more remote locations by rail. Instead we need a solution that	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity.

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		replaces a mind-set of disposal with a mind-set of treatment and waste recovery. That is the only long-range sustainable solution. Treatment needs to begin close to the points of origin, to reduce transportation costs and the volume of waste. Locally-hosted micro-treatment facilities, probably ones that employ cargo-containers, is the most likely alternative considering current technology today. Combining solid waste treatment with sanitary sewer conveyance systems allows for reduction of weight and leveraging recent technology advancements with aerobic microbes. Treatment of solid waste would become more rapid, efficient, and odorless using aerobic treatment processes. This is a win-win for both solid waste and sanitary waste treatment systems. Longer-range planning should include using this same waste-recovery technology to begin "mining" our existing landfills for recyclables and compostables and reducing their existing footprints over time. We can reverse decades of environmental harm, recover cur land-fills, and make productive use of those properties once again	
Republic Services	Chapter 6 - Disposal	How should King County dispose of its garbage over the long term? Waste-by-rail to an in-state gas-to-energy plant. Should we expand the landfill so it lasts longer? No. Western Washington is not a good place for a landfill because of the amount of rain fall. A promise was made to the community that the landfill would be expanded. Ship our waste out of County on rail? Build a waste-to-energy facility where it will be burned? Something else?	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity.

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		There are modern landfills in our regional that extract the gas from their landfill and produce energy.	
Republic Services	Chapter 6 - Disposal	**In a recent study on Incineration paid for my King County tax payers , the study estimated the cost of mass burn incinerator at 1.1 BILLON dollars!** Are we really going to ask our community to pay for this when there are already several facilities already capitalized and ready to go? The study group could not answer questions regarding air bourn containments' produced at the incinerator. Mass burn incineration should not be considered in the comp plan at all. It is **not a new technology** and the harmful effect on health are in question. Our regional has millions of tons capacity for king county. Washington does have state of the art facility that exceed our federal and state standards. Here they are list below. There is no need to spend **1.1 Billon dollars** on a facility that we don't need and may have harmful effects on our health. Mass burn incineration should be stricken from the Comp plan. **Washington Landfill Capacity:** **Roosevelt Regional Landfill has approx. 2.5 mil tons of capacity for about 100 years and is already producing electricity in the State of Washington** Wenatchee landfill has 30,889,197 tons left Cowlitz has 52,787,279 tons left **Oregon Landfill Capacity:** Columbia Ridge has an estimated 103 year life span, and has permitted tons left of 265,122,000 Finley Buttes has an estimated 100 year life span, and has permitted tons left of 100 million tons Wasco has an estimated 118 year lifespan with total capacity of 19 million tons, very low volumes per year.	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity.

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Auburn	Chapter 6 - Disposal	We encourage the SWD to continue to work with its advisory committees to evaluate future disposal options once the Cedar Hills Landfill is no longer an option. The Draft Plan identifies the potential options, but it may not be necessary to select the final option in the Comp Plan. There are many factors to consider and consulting with the members of the interlocal agreements is required.	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity.
Carnation	Chapter 6 - Disposal	When looking at how we should dispose of garbage long term, I would recommend a balanced long-term solution. This solution should be efficient and innovative. We need a system that is flexible, gives us the ability to adapt to changes and prepare for the future with a goal of not using landfills. Thank you for the opportunity to respond and Carnation looks forward to working with King County as we move into the future.	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity.
Eric Hudson	Chapter 6 - Disposal	Sieze this Opportunity - Create the Cedar Hills Wilderness Preserve! Cedar Hills is an "Accidental Landfill". It is an environmentally sensitive area and the worst possible location for a waste facility. It's proximity to the Cedar River and Issaquah Creek make it too risky to continue operations. There are many many better locations for solid waste. At less sensitive locations, it would be easier to incorporate new technologies and conduct research on recycling the solid waste. As leaders for the county I ask that you begin plans for the future to dispose of waste at a less sensitive, less populated area. I ask that the Cedar Hills landfill be designated a Wilderness Preserve and plans be made to convert the landfill area to a Natural Area. Let's allow Nature to heal and wildlife to return.	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity.

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		The surrounding neighborhoods have been exposed to toxic pollution for years with unstudied health impacts. Please act upon King County's environmental vision. Find a better location to dispose of solid waste!	
Bellevue	Chapter 6 - Disposal	After identifying and comparing the disposal options outlined in Chapter 6, the Plan should identify a recommended or preferred alternative to further develop Cedar Hills as the preferred alternative given the Plan's analysis of the estimated capital costs, operating costs and environmental impacts of each alternative. In addition, any disposal option other than further development of the landfill would require consultation with the Metropolitan Solid Waste Management Advisory Committee (MSWMAC) as required by Section 5.1 of the ILA. *Requested change (p.6-19): Select disposal option 1 to "further develop Cedar Hills" as the preferred disposal alternative.*	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity.
Bothell	Chapter 6 - Disposal	During the presentation our City Council expressed concerns over the impacts of rate structures and planning for the long term future of solid waste in the region. The draft Plan provides three options for the future of Cedar Hills Landfill. The City of Bothell would prefer to use the existing landfill as long as possible while working together to determine the best possible option for solid waste needs in the future	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity.
Federal Way	Chapter 6 - Disposal	The Draft Plan outlines the major aspects of the system (finance, transfer stations, recycling options, and sustainability) and also future waste disposal options, including increasing permitted capacity at the Cedar Hills Landfill. This existing landfill is the least expensive disposal option for our region's system, and much of the Draft Plan focuses on how to extend its life (through waste reduction, recycling, etc.).It is clear that	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity. The ILA process in Section 5.1 would be convened at the appropriate time in advance of Cedar Hills reaching capacity.

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		the next more expensive disposal option would be railroad-based waste export to landfills east of the Cascades, in keeping with current KCC Title 10 policy once Cedar Hills reaches capacity. Still more costly alternatives include siting and building incineration or digestion systems, which produce energy as a by-product (but at a higher cost than existing power utilities, so this energy production could be categorized as "cost subsidized"). Further, these more expensive disposal options would still require landfill disposal of residuals or ash, along with related waste export infrastructure, so these related expenses should be accounted for consistently in cost comparisons. The Draft Plan estimates a capital cost of $1.1 billion for a "mass-burn" incinerator – roughly four times higher capital cost than increasing permitted local landfill capacity from 2028 through 2040. The City's preference is for disposal options that sensibly maximize waste diversion and recycling practices while maintaining capital and operating cost efficiencies that are in the best interest of the ratepayers we represent. As such, the more costly incineration option is cause for concern, and the City would appreciate knowing the additional cost Federal Way ratepayers would be asked to bear if this disposal option were selected. The County Executive will consider input on the Draft Plan to propose a recommendation for the future disposal method to be included in the "final" Plan. The City is, however, concerned that the process for cities to provide advice and input as described in Section 5.1of the Solid Waste Interlocal Agreement may be overshadowed. Related concerns are detailed in the City's comments on Chapter 6 of the Draft Plan. Any decision	

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		other than increasing the capacity of the Cedar Hills landfill will trigger Section 5.1and require engagement with cities regarding alternatives and potential agreement extension.	
John Stone	Chapter 6 - Disposal	https://www.covanta.com We believe that sustainability is achieved through a combination of human, economic and natural factors. We adhere to this vision by continually striving to improve ...	Thank you for your comment
Jim Loring	Chapter 6 - Disposal	Modern incineration techniques as implemented in some European countries and as described here (http://bit.ly/2EbvZtW).	Thank you for your comment
Issaquah	Chapter 6 - Disposal	The County has outlined three options for disposal past 2028. The Plan states that an option must be chosen as part of the approval of the Plan, and outlines important selection criteria, but does not state when or who will select the final option. The City supports the selection criteria identified and would like to see a clear recommendation from the King County Solid Waste Division and the County Executive when the plan is transmitted to the King County Council for approval. The recommendation should reflect all six categories of the selection criteria, information presented in the Plan, and comments received from cities and the public.	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity.
Issaquah	Chapter 6 - Disposal	It is important that the City and County deal with our created waste within our own borders as a priority, before considering sending our waste out of County for disposal. Additionally, based on the data inthe Plan the Waste to Energy option isprohibitively expensive, isnot consistent with waste reduction and diversion goals, does not support City or County carbon reduction targets, portends considerable time and expense for siting and brings with it the potential for many environmental issues. The Cedar Hills Landfill has been a cost-effective, local method of solid waste disposal for	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity.

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		more than 50 years. Extending the life of the landfill for as many years as possible makes the most sense for the ratepayers of the County, and is consistent with greenhouse gas emissions reduction policy and commitments.	
Dee Bee	Chapter 6 - Disposal	I know in utah they dug a enormous amount of land and made some kind of barrier with ability to drain....this landfill was many times the normal size, it would take many years to reach capacity. However when it did was covered and some kind of process or natural reaction produced energy that could be harnessed and distributed. My father helped excavate the site. Someone should look into that project!	Thank you for your comment. The Cedar Hills Landfill is a state-of-the-art landfill that is similar to the one that you describe. It is lined and collects gas and leachate. The methane gas generated by decomposing waste is sent to a facility that converts it to pipeline-quality natural gas that is sold to Puget Sound Energy.
Brian Tate	Chapter 6 - Disposal	King County could certainly do a much better job in this area. My good friend Darrell Jones built the Sumas power plant from the ground up. I believe when it was first built it operated on recycled wood. It has been operating very efficiently since about 1993. About 2007 or 2008 PSE bought the plant. http://thenescogroup.com/portfolio/sumas-cogeneration/	Thank you for your comment.
Laurie Dumouchel	Chapter 6 - Disposal	In addition, moving waste out of county is immoral. We create the problem here; we must solve it here.	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity.
Kevin Jones	Chapter 6 - Disposal	I strongly endorse the Cedar Hills Landfill expansion as the lower cost and much lower Greenhouse Gas Emission scenario (per figure 6-7 on page 6-10 of the plan)	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity.
Marina Subbaiah	Chapter 6 - Disposal	I support transporting waste outside of King County by rail, which the City of Seattle already does, primarily because King County has repeatedly failed to address community concerns regarding Cedar Hills Landfill. I live within the area of the Cedar Hills landfill, and the odor is a significant problem. I have been repeatedly disappointed in King County's complete lack of engagement with residents in this area about the problem of the odor. I know neighbors that report poor air quality multiple times a week, and	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity.

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		nothing is done. People live here, that needs to be taken into serious consideration. When it was created, the location of Cedar Hills landfill was a very remote area, but it is now quite populated, with the population density continuing to grow. Cedar Hills has served the area well for decades, but it is time to move on. Landfills should be sited in remote areas with steps taken to minimize impacts on surrounding communities. Thank you for taking my feedback into consideration.	
Alikay Wiley	Chapter 6 - Disposal	I support transporting waste outside of King County by rail, which the City of Seattle already does, primarily because King County has repeatedly failed to address community concerns regarding Cedar Hills Landfill. I live within the area of the Cedar Hills landfill, and the odor is a significant problem. I have been repeatedly disappointed in King County's complete lack of engagement with residents in this area about the problem of the odor. I know neighbors that report poor air quality multiple times a week, and nothing is done. People live here, that needs to be taken into serious consideration. When it was created, the location of Cedar Hills landfill was a very remote area, but it is now quite populated, with the population density continuing to grow. Cedar Hills has served the area well for decades, but it is time to move on. Landfills should be sited in remote areas with steps taken to minimize impacts on surrounding communities.	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity.
Larry Tornberg	Chapter 6 - Disposal	I strongly support transporting waste outside of King County by rail. Cedar Hills has repeatedly been expanded each time the facility nears its capacity. Past promises for solutions other than expansion at the existing site have never been met. The localized problems with odors only continue to grow and the mountain of garbage only continues to grow. Expansion means either growing the peak higher	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity.

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		and/or expanding the area around the existing landfill. Both are unacceptable. Unincorporated King County and those of us living for decades in the vicinity of the land fill do not need to continue to bear the burden (primarily safety and health) of the cities dumping their garbage at Cedar Hills landfill. Thank you for the opportunity to comment.	
Heidi Nees	Chapter 6 - Disposal	I support transporting waste outside of King County by rail, which the City of Seattle already does, primarily because King County has repeatedly failed to address community concerns regarding Cedar Hills Landfill. I live within the area of the Cedar Hills landfill, and the odor is a significant problem. I have been repeatedly disappointed in King County's complete lack of engagement with residents in this area about the problem of the odor. I know neighbors that report poor air quality multiple times a week, and nothing is done. People live here, that needs to be taken into serious consideration. When it was created, the location of Cedar Hills landfill was a very remote area, but it is now quite populated, with the population density continuing to grow. Cedar Hills has served the area well for decades, but it is time to move on. Landfills should be sited in remote areas with steps taken to minimize impacts on surrounding communities.	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity.
Mary Jo Tornberg	Chapter 6 - Disposal	I support transporting waste outside of King County by rail, which the City of Seattle already does, primarily because King County has repeatedly failed to address community concerns regarding Cedar Hills Landfill and the compost facility next door. I have lived near the Cedar Hills landfill for 29 years. The odor is a significant problem. I have been repeatedly disappointed in King County's complete lack of engagement with residents in this area about the problem of the odor. I report poor air quality multiple times a month, and nothing	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity.

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		is done. People live here, that needs to be taken into serious consideration. When it was created, the location of Cedar Hills landfill was a very remote area, but it is now quite populated, with the population density continues to grow. Cedar Hills has served the area well for decades, but it is time to move on. Landfills should be sited in remote areas with steps taken to minimize impacts on surrounding communities. Thank you for considering my comments.	
Amber and Andrew Maratas	Chapter 6 - Disposal	Thank you for taking comments regarding Cedar Hills waste and the areas future plans. I just moved to Sunset Valley Farms on Maple Valley Road and was upset to learn our expensive move into King County to be infiltrated by a horrible stench first discovered after a few weeks living here. I have since found out that smell to to be from Cedar Hills Landfill despite. I support transporting waste outside of King County by rail, which the City of Seattle already does, primarily because King County has repeatedly failed to address community concerns regarding Cedar Hills Landfill. I live within the area of the Cedar Hills landfill, and the odor is a significant problem. I have been repeatedly disappointed in King County's complete lack of engagement with residents in this area about the problem of the odor. I know neighbors that report poor air quality multiple times a week, and nothing is done. People live here, that needs to be taken into serious consideration. When it was created, the location of Cedar Hills landfill was a very remote area, but it is now quite populated, with the population density continuing to grow. Cedar Hills has served the area well for decades, but it is time to move on.	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity.

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		Landfills should be sited in remote areas with steps taken to minimize impacts on surrounding communities. Thank you for your time and consideration	
Janet Dobrowski	Chapter 6 - DIsposal	Your draft talks about "Equity and Social Justice". *"Equity is achieved when all people have an equal opportunity to attain their full potential. Inequity occurs when there are differences in well-being between and within communities that are systematic, patterned, unfair, and can be changed. These differences are not random; they are caused by our past and current decisions, systems of power and privilege, policies, and the implementation of those policies."* I maintain you are not even following your own principle. It is UNFAIR to continually put the burden of these facilities on our neighborhoods. Our "well-being" is far from equitable from other communities. *"Social justice encompasses all aspects of justice, including legal, political, and economic; it demands fair distribution of public goods, institutional resources, and life opportunities."* Fair distribution? Not even close - we are willing to share – send it to one of the affluent neighborhoods! The draft talks about siting new transfer stations and that *"that any negative impacts of the facilities do not unfairly burden any community."* So in deciding whether or not to expand the landfill and lengthen it's life, why isn't consideration given to OUR communities concerning any unfair burden? We deal with odors, noise, truck traffic, garbage, rodents and the always present burden of not really knowing if there are any contaminants in the air that we are breathing. Is that not burden enough?	Thank you for your comment. Equity is a consideration in selecting a long term disposal approach.

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		We moved here in 1988 and at the time, we were told the landfill would close in 2000. 2000 came and went, and then it was 2012, then 2028, and now 2040 (maybe). Cedar Grove was established AFTER we moved in and Cedar Mountain Reclamation just started up in the last couple years. My husband and I will be dead before Cedar Hills closes (if it ever does).	
Janet Dobrowski	Chapter 6 - Disposal	The draft only has 3 options: **Expand the landfill** and lengthen its life thru new permitting. NOT my preference. This, to me, is a self serving option. King county permitting its own landfill to expand – how convenient. The way the options have been evaluated, it seems a foregone conclusion that the council will select this option. There seems to be a clause that states there must be a $90 million reserve for monitoring and maintenance AFTER the landfill is closed. To date, there is only $25 million. What has King county been doing all these years? Have they been dipping into it so as to pretty much guarantee there will never be enough to close it? Is the $9 million/year for financing refuse area development with rate dollars managed in the Landfill Reserve Fund why it's so low? I don't believe the County is truly serious about closing the landfill and will do anything necessary to keep it open and extend its life. If it did, it would do more to fund this reserve. As it is, it looks like they may never have the required reserved. The draft stated that it needs to have a 7 year period to begin to close the landfill and take into consideration all underlying contracts. Again, the county is not serious about closing the landfill. If they had been they would have started the process for the current closing date, rather than squeeze out additional pits. **Export** – This option doesn't seem to be one the council would seriously consider, but it is **our preferred option.**	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity.

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		Close the landfill as promised and scheduled and export the waste. **Incineration** – Too many potential problems, concerning noise, pollutants and toxins. Definitely do NOT want an incinerator located at Cedar Hills. The EIS has stated that this would be preferred because there would be less impact on the environment to build here. Noise is another problem, if located at Cedar Hills. There were several issues with the gas plant that have since been resolved. But the plant can still be heard. Toxins (TAP) are still released from a plant like this. There is an elementary school within 1 mile of Cedar Hills. Exposing children to these toxins is unacceptable. Sweden is currently using incineration and it is very successful there in reducing waste and generating electricity.	
Janet Dobrowski	Chapter 6 - Disposal	The 2 things I would never like to see: 1. Raising the height to 830 feet is totally unacceptable. It's bad enough with the noise and smell from the landfill, but to raise it, we then must SEE it. When will the assault on the surrounding neighborhoods by King County ever quit. If nothing else, this is ONE concession they should grant our neighborhoods. 2. Never encroach on the 1000' buffer. I know it's not in the current options, but I will never trust King County to not change the permitting for this area. With the growth in the surrounding areas, the landfill is no longer "out of sight, out of mind". It is a blight on the landscape. Have any of the council members hiked Squak Mountain or Tiger Mountain and taken in the view? There are beautiful views of Mount Rainier, but it is pretty much ruined with the scar of the landfill glaring right beneath the mountain. Pictures are ruined by it. As the population expands into this area, Cedar Hills has a bigger impact on the	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity.

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		surrounding neighborhoods. It's time to seriously, and I mean SERIOUSLY, consider closing it and select one of your other options, preferably exporting the areas waste. I will say, since the lawsuit in 2000, the landfill has improved substantially. There is room to improve – the odor does still occur, but not as prevalent as before. I have little hope the County will do right by the surrounding neighborhoods by closing the landfill as previous promised and scheduled.	
Janet Dobrowski	Chapter 6 - Disposal	The plan does highlight some very helpful ways it's trying to reduce the waste flow, but until manufacturers change their packaging, there will still be a lot of garbage, regardless of where it ends up. That said, with the advent of China putting new restrictions on what sort of recyclable material it will take - what does that do to your projections? The material that is no longer accepted will have to go somewhere.	Thank you for your comment. The division is working with a task force comprised of haulers, cities and other stakeholders to develop actions to address local processing, market development and address the contamination issues in recyclables that are collected.
Meghan Brookler	Chapter 6 - Disposal	A Team of International and National Independent Experts with decades of experience designing, integrating and implementing Sustainable Solid Waste Management Systems including Collection, Landfill, Recycling, Composting, Anaerobic Digestion, Sewage Treatment and Energy and Material Recovery Systems (Advanced WTE) as well as developing regulations, producing, reviewing and evaluating scientific facts, etc. has reviewed the King County Draft Solid Waste Management Plan (DSWMP) and Draft Environmental Impact Statement (DEIS) and is providing the following assessment/comments: The DSWMP fails to evaluate and examine the advantages and disadvantages of the very claims it makes including use of Landfills, WTE, Recycling and other key options.	Thank you for your comment.

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Meghan Brookler	Chapter 6 - Disposal	According to the information provided in the plan, landfilling is supposed to be cheap, safe and environmentally friendly and all other options (e.g. Anaerobic Digestions and Waste-to-Energy) are presented as expansive, dangerous and distressing thus not viable for King County. The team concurs that this is simply not accurate and true. Facts are ignored. Especially alarming are the false Greenhouse Gas emission volumes given for the Cedar Hills Landfill. From a scientific perspective, the climate is warming at an alarming and unnatural pace and Greenhouse Gases from landfills, including Cedar Hills are considerable contributors to Global Warming specifically in contrast to other viable and environmentally proven alternatives such as recycling, anaerobic digestion, energy and material recovery systems etc. The concept of landfilling is an outdated approach for handling modern waste appropriately.	Thank you for your comment. To ensure that greenhouse gas emissions for disposal options received comparable evaluation, the plan used models used by the U.S. Environmental Protection Agency and the Washington Department of Ecology.
Meghan Brookler	Chapter 6 - Disposal	When assessing the true cost of landfilling untreated and still reactive solid waste, landfills are significantly more adverse and environmentally detrimental than other viable alternatives. The recent King County Waste-to-Energy/Waste Export Study (prepared by the Normandeau Team) made 27 recommendations that are vital in the process of evaluating viable economic-ecologic options. These key elements for King County were not included in either the DSWMP nor the DEIS. Without this information a proper evaluation cannot take place and the plan should be halted and updated accordingly. It is essential that a comprehensive environmental and legally defensible analysis with an integration of these findings be undertaken.	It is assumed that this comment references Section 4.1 of Normandeau's 2017 Waste to Energy Options and Solid Waste Export Considerations report. The items listed in that section would be considered as possible next steps if waste-to-energy is pursued as a means of long term disposal.
Meghan Brookler	Chapter 6 - Disposal	The DSWMP does not enable but hinder the opportunity to build a working recycling infrastructure. The current numbers of 50% are questionable and it is very unlikely without some major changes to getting even close to a 70%	Thank you for your comment. The recycling infrastructure that has developed over the past several decades is the result of a public/ private partnership. The recycling rate for 2015 is

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		recycling rate. Recycling faces significant challenges and these are not adequately addressed in the plan. In order to move towards a 70% recycling rate a much more aggressive local infrastructure is required including moving away from landfilling.	documented to be 54%. There is no doubt that achieving a 70% recycling rate will be challenging, but having a landfill does not preclude aggressive recycling.
Meghan Brookler	Chapter 6 - Disposal	It is important to know that the current DSWMP is focused on landfilling, which is the least sustainable option. Landfilling ranks lowest by the US EPA and comparable international waste management hierarchies. Landfilling offers the public the least viable/sustainable environmental option and is not economical when all costs and potential revenue streams are included.	Thank you for your comment.
Meghan Brookler	Chapter 6 - Disposal	The Draft Solid Waste Management plan fails to address an integrated approach that offers many benefits in regards to the reductions in greenhouse gases and other environmental pollutants into air and ground, the creation of jobs, revenues, recovery of materials recycling/upcycling and waste avoidance opportunities. These options will also eliminate the need for any additional landfill expansion and will save King County and its residents hundreds of millions of dollars.	The Plan discusses many approaches that are used together including possible long-term disposal options and their impacts to the environment, greenhouse gas emissions, jobs, material recovery and revenue.
Meghan Brookler	Chapter 6 - Disposal	It does not seem that the DSWMP has been thoroughly updated and comprehensively reviewed for a number of years. For example, the Plan lacks current innovative and technical solutions.	The Public Review Draft Plan issued in January 2018 was an updated version of the 2001 Plan. Data in the current Plan document were further updated in 2018.
Meghan Brookler	Chapter 6 - Disposal	Considering that the Draft Environmental Impact Statement (DEIS) is based on the Draft Solid Waste Management Plan, the DEIS should be withdrawn and not be finalized. It is not thorough, it is technically inaccurate, and not legally defensible. The DEIS process needs to be stopped immediately.	Thank you for your comment.
SCA	Chapter 6 - Disposal	First, it seems like the range of greenhouse gas emissions shown in the chart on 6-14 shows the range of emissions between 12,000 and 125,000 MTCO2e for the 20 year model for a waste to energy plant. However, I think the maximum	The Normandeau WARM results for the 20-year waste-to-energy scenario that uses King County's waste composition should be 79,592 (or 80,000 if

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		MTCO2e in the model was 80,000. The 125,000 MTCO2e comes from the 50 year model.	rounded to the nearest thousand). The higher number in the plan was for the 50-year scenario.
SCA	Chapter 6 - Disposal	If there was too much waste for the capacity of the WTE facility in 2048, it seems like other disposal options could be considered correct? Is capacity projected to increase well above the 4,000 ton capacity after 2048?	Tonnage is projected to increase steadily after 2048. Other disposal options (such as export) could be considered beyond 2048 instead of building an additional mass burn facility but the total disposal cost per ton for that combination option would add the cost of the parallel disposal system to the continuing operation cost for the original mass burn facility.
SCA	Chapter 6 - Disposal	Would having two different systems be more expensive than two WTE facilities? Is there analysis on this?	No, having two different systems would not be more expensive than having two waste to energy facilities. The Normandeau report includes information that could be used to do this analysis.
Zero Waste WA	Chapter 6 - Disposal	We are strongly opposed to a waste-to-energy option. This does not make sense from an environmental or economic perspective at this time.	Thank you for your comment
SCA	Chapter 6 - Disposal, p. 6-17	Second, the chart on the 6-17 shows the cost/ton for WTE as $121 at year 20. However, in the model the cost/ton is $37 in year 20.	The 2017 Normandeau report estimated that in year 20 (actually, the 21st year when all bonds are paid off) the cost per ton for the mass burn facility drops to purely operating cost. However, the capacity of the mass burn facility also is fully used in year 20. An additional expanded mass burn facility must be built to handle the growing waste in the regional system in year 21 and beyond. Showing only the 2048 operating cost for the first mass burn facility does not account for the full cost of disposal given that significant new capital investment (and operating cost) must be undertaken for a new mass burn facility. So in Figure 6-9 to show an approx. 20-year apples-to-apples comparison with export we did not show either the drop of the bond payments for the first mass burn facility or the new capital cost for the additional mass burn facility. A footnote to Figure 6-9 has been added to say that the waste-to-energy

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			cost per ton actually runs through 2047, the last year of the initial 20-year bond payments.
Zero Waste Vashon	Chapter 6 - *Diversion of Waste p. 6-3*	Potential strategies should include increasing compost facilities.	Increasing compost facilities as a potential option has been added to page 6 – 3.
Janet Wall	Chapter 6 - Illegal Dumping	I have been recycling since it was first introduced in Seattle by opening transfer stations to take recycling materials—newspapers, cans & bottles. Issaquah has used Recology Cleanscapes for a number of years now, and I really like their service. I can go to their store on Gilman and take in my household batteries, block Styrofoam, defunct computer parts, small appliances, and other items that would ordinarily be hard-to-recycle. Clean plastic bags and plastic films can be recycled now by putting them in larger plastic bags and placed in blue recycle toters. The people at the store have been very helpful about telling me where I can recycle items that they do not take—like old oil and car batteries. As I am able to recycle or compost almost all of my household waste, I have very little garbage and have gone to having a monthly pickup for more than a year now. I also pick up and recycle or compost items that is litter along SE 56th St. People are dumping all kinds of items along the roadside, so I appreciate being also able to take items such as old tires, large metal pieces, and even chunks of concrete or asphalt to occasional nearby recycling events. I wish people wouldn't litter because it is a lot of work to pick up all their trash, sort it, and clean it enough so that it is suitable for recycling or composting, but it is good that I am able to get rid of most of it. Perhaps we need some more public announcements on TV to discourage people from littering. Almost all the litter I see is obviously intentional, not accidental littering.	Thank you for your comment and your commitment to waste reduction and recycling. The division has a program to clean up illegal dump sites on public and private land.
Waste Management	Chapter 6 - Page 6-10, Rail Capacity	There is adequate rail capacity if King County considers all rail options available and selects a landfill served by the east/west rail corridor such as Wenatchee LF. Choosing	Thank you for your comment

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		Wenatchee LF as a waste export option would provide the County with another rail transportation option, especially if and when there is a congested north/south rail corridor.	
Waste Management	Chapter 6 - Page 6-6, King County's Long-Term Disposal Method Will Be One of Three Options	The County should not limit itself to three options and should also consider a fourth option: alternative waste diversion and conversion technologies. The County has been keeping its finger on the pulse of emerging technologies and should give itself the option to pursue these alternative technologies within the scope of the Plan.	Thank you for your comment. Policy FD-4 in Chapter 3, action 3-d in Chapter 6, and new action 36-s all address monitoring, assessing and perhaps pursuing emerging technologies or other options to divert waste from the landfill.
Waste Management	Chapter 6 - Page 6-7, Waste Export	There may be substantial benefit, both financially and otherwise, in King County exporting a portion of the municipal solid waste earlier in the process, in parallel to extending the life of the Cedar Hills Landfill. The County could consider bifurcating the management of the solid waste stream – a portion to Cedar Hills and another segment of waste to be exported to an out-of-county landfill. This strategy would present the County with another option than the choices offered in the Plan.	Thank you for your comment.
Waste Management	Chapter 6 - Page 6-8, Table 6-1. Potential Locations for Out-of-County Landfill Disposal	WMW once again requests that the Greater Wenatchee Regional Landfill (Wenatchee LF) be included in the table of potential locations for out-of-county landfill disposal. See information to be added at the end of this comment. Wenatchee LF currently processes 350,000 tons per year and not 175,000 tons of refuse per year as the County indicated in its response to our first set of Plan comments, dated November 3, 2017. Wenatchee LF is currently also a King County designated landfill for construction and demolition debris disposal. We would also like to note that Wenatchee LF is 157 rail miles from Seattle, which is half the distance of the closest landfill as identified in the Table 6-1, and it is the closest rail-served regional landfill. Utilizing the Wenatchee LF as a waste export option would provide King County with flexibility in both transportation and disposal options. Additionally, Wenatchee LF uses the east/west rail corridor, while most other identified landfills use the	Thank you for your comment. The information has been added to Table 6-1, which can be found in Appendix F.

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		north/south rail passageway.(see comment letter for info on landfill)	
Tim Larsen	Chapter 6 - Technology	I like the way you recycle food waste in yard waste and turn it into compost. Now I'd like you to consider something more. In Japan they recycle plastic at a whole new level. the plastic bottles they recycle like normal but the rest of the plastic they can't use they either gasify liquefy or turn into other plastic items like decking and stuff like that. I'd like you to consider is the gasification or Liquefication. They have machines in Japan specifically in Yokohama, that can turn waste plastic into oil diesel and gasoline. I think you really should look into this because these are machines that you can buy. You could ship them to King County. They are scalable to the amount of plastic you need to process. They work on the same principle. They heat up the plastic, gas is released and condensed into oil. This oil can be refined into gas or diesel. I hope you look into this.	Thank you for your comment. There is a discussion of potential technologies to consider in Chapter 6.
Zero Waste Vashon	Chapter 6 - *Waste Export p. 6-7*	It seems the transportation costs & carbon footprint would make these high cost alternatives. We should deal with our own waste within our county and not export it at great cost and potentially negatively impact others.	Thank you for your comment.
Zero Waste Vashon	Chapter 6 - *Waste to Energy Facility p. 6-9*	This seems to be an excessively costly alternative! The ash produced seems to be a toxic byproduct needing disposal. The carbon footprint also seems to be extremely high. Expensive, the title implies that this study looks at multiple ways of converting waste to energy (Let's call it mass burning), Why are there varying reports on air quality issues pertaining to this technology? If we accept this technology is there danger that we will reuse less? What municipality will accept this plant? Is there existing rail or will a rail line have to be funded and built?	Thank you for your comment.
Janet Dobrowski	Chapter 6 -Disposal	The draft outlines the "path" of solid waste with 4 paths: Garbage, Construction & Demolition Debris, Compostable	Thank you for your comment.

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		Organics, and Recyclables. 3 out of 4 ultimate destinations are within 2 miles of each other: Cedar Hills Cedar Grove Cedar Mountain Reclamation The neighborhoods surrounding these areas are constantly assaulted with noise, odors, rodents and garbage. In addition, the County is considering granting a permit to an asphalt plant, again within 2 miles from Cedar Hills. Aren't we lucky? When will the county EVER consider the health and well being of the surrounding neighborhoods and stop permitting these obnoxious, nuisance and potentially unhealthy endeavors. And now you want to extend the life of the landfill another 22 years. This is totally unacceptable and UNFAIR to the surrounding neighborhoods.	
Greater Maple Valley UAC	Chapter 6, Action 2-d	We do not support any expansion of the Cedar Hills Landfill. Waste reduction and energy production should be explored. Waste-to-Energy facilities are a proven technology that should be fully explored as to location, environmental, and financial viability. Proximity to rail facilities would be desirable for shipment of ash to a proper and safe final disposal location. Recycling is an important component of such a facility, as is valuable materials recovery must be a component to be employed prior to final ash disposal. Waste reduction by incineration alone should also be explored as to its environmental and financial viability. There is located in South Seattle on West Marginal Way a large rotary kiln that was part of the Lafarge-NA cement plant. Although the basic components for incineration are present and should be useable, emission control and feed mechanisms must be designed and installed to ensure	Thank you for your comment. One of the options for long-term disposal that is evaluated in the Plan is building a waste to energy plant. The LaFarge cement plant kiln might warrant more study if waste to energy is considered as a disposal option in the future.

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		compatibility with surrounding environs. Valuable materials recovery from the ash should be a component of this type of waste reduction operation. This type of high temperature combustion facility should be capable of handling used tires, non-hazardous contaminated soil, dredge spoils, sludge, and other such wastes. This site is served by rail facilities for cost effective transport of ash to a final disposal location. Pursuant to RCW 70.95.010(8), incineration is equivalent in the disposal hierarchy to landfill and energy recovery operations. Continue a strong emphasis on education, incentives, and recycling.	
Federal Way	Chapter 6, pg 6 -5	The County has a preferred future disposal method (waste export), per KCC Title 10 - including RTS-1, RTS-3, RTS-5, RTS-16, and 10.25.060 (A) and (B). Further, the 2016 King County Comprehensive Plan (2016 Update) (King County 2016a) indicates that "King County should maximize the capacity and lifespan of the Cedar Hills Landfill" Disposal method selection results from stakeholder input, cost analysis and policy review of an array of options. ideally, this Plan will outline options and make recommendations. However, "Approval" of this Plan in itself should not be described as the mechanism where the next disposal method will be "selected". Per Section 5.1 of the Solid Waste Interlocal Agreement (SWIA): if no decision is made by circa 2021 to expand Cedar Hills capacity, the County will engage in advisory committee consultation to seek input on the selection of the next disposal option for the system, along with a discussion of extending the term of the SWIA. Note that the WTE disposal method presumes extension of the SWIA's term	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity. The ILA process in Section 5.1 would be convened at the appropriate time before the landfill is predicted to reach its permitted capacity.

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		beyond 2040, but SWIA Section 5.1 states there is no requirement for parties to reach agreement on SWIA term extension. Regardless of the disposal option ultimately 'recommended' in this plan, if that option favors closure of Cedar Hills it will trigger Section 5.1 (based on the projected closure year). In view of these factors, this section would more appropriately be titled: "Overview of Major Disposal Options for this System" and the text revised so it does not infer this Plan's approval is the sole mechanism for selecting a disposal option. If no new Cedar Hills capacity is planned for, it follows that MSWAC & SWAC consultation would be triggered to consider a range of disposal options followed by amendment of the Plan as needed.	
Federal Way	Chapter 6, pg 6-10	This discussion raises potential issues that warrant more direct engagement with rail service providers to better determine the likelihood of adverse impacts. Also, the Plan should indicate if other local jurisdictions that already export waste by rail have similar concerns (and if so, how these concerns are being addressed). The Plan should also address what alternatives would be put into play if the transfer system and/or the disposal method became unavailable for a period of weeks. Presumably if transfer trailers could still haul the waste, it would be temporarily stored – likely at Cedar Hills landfill. The discussion on "Disposal Services After an Emergency" (Page 5-28) should be expanded to describe the need for temporary MSW handling options in case parts of the transfer and disposal system fail or go offline, making a clear distinction	Thank you for your comment. The section "Disposal Services After an Emergency" has been updated.

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		from debris management.	
Federal Way	Chapter 6, pg 6-12	Typo: missing period or missing text State whether or not extending the length of time for accruing post-closure reserves would appreciably decrease rates. Conversely, state if the necessary post-closure balance amount is the same regardless of the total cubic yards of permitted capacity ultimately filled (i.e., determine if post-closure funding needs may also increase if the permitted capacity increases).	Thank you for your comment. The typo has been corrected. The post-closure reserves discussion has been edited.
Federal Way	Chapter 6, pg 6-14	There is debate regarding the accuracy or applicability of EPA's WARM approach when applied to WTE, including how it accounts for biogenic C02, and presumes WTE generated energy fully offsets other energy source emissions (which still occur in spite of adding WTE-produced energy into the grid), plus the relative scale at which emissions and energy are produced from conventional sources vs. WTE, and also how landfill methane impacts are applied. These discrepancies should be addressed more fully in the Plan since the WTE data shows a wide range of net emissions, presumably reflecting such discrepancies. In short, it is unclear in the draft text why a wide range is shown in Figure 6-7 for WTE.	Thank you for your comment. The range indicated in Figure 6-7 has been corrected to 12,000 -80,000 MTCO2e.
Federal Way	Chapter 6, pg 6-14	Figure 6-7 is not referenced in the text (or in Appendix D). This table does not show the year for this baseline, or the MSW tonnage used to arrive at these figures.	Thank you for your comment. Figure 6-7 has been removed.
Federal Way	Chapter 6, pg 6-14	The Plan should note that WTE is a higher-cost disposal method that also has higher GHG emissions than the other options, and requires importing waste into the County to be burned that would further add to local GHG emissions. The Strategic Climate Action Plan (SCAP 2015) summarizes "GHG emissions reduction targets adopted as Countywide Planning Polices by the King County Growth Management	Thank you for your comments. Table 6-1 indicates the costs and GHG emissions for all of the options, including waste to energy.

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		Planning Council in 2014 (are) to "reduce countywide sources of GHG emissions, compared to a 2007 baseline, by 25 percent by 2020, 50 percent by 2030, and 80 percent by 2050." Internally, King County has committed to reducing GHG emissions from its operations, compared to a 2007 baseline, by at least 15 percent by 2015, 25 percent by 2020, and 50 percent by 2030. The County has further committed to achieving net carbon neutrality for the Department of Natural Resources and Parks by 2017, with the Wastewater Treatment Division and the Solid Waste Division each independently achieving carbon-neutral operations by 2025. The 2015 SCAP outlines the results of technical analysis that established specific, quantifiable pathways to achieving the overarching GHG emissions reduction targets at both the countywide and government operations scales." The WTE disposal option appears to work against achieving these targets, and the Plan does not indicate how the County will "make up" for WTE's GHG emission increases.	
Federal Way	Chapter 6, pg 6-14	Footnote 1 in Appendix D Table 1 appears to provide a reason for the low and high range that is shown in this Fig. 6-7, but says that the inputs used in the model that generated these figures "are not available" which raises concern about accuracy and assumptions that resulted in these estimates. The County should verify how the range was calculated, and an explanation added to a footnote in Figure 6-7.	The estimates referenced in footnote 1 were made by consultants with deep experience with waste to energy facilities. The division's interpretation of the reasons for the range of results is shown in footnote 1.
		Assuming Fig. 6-7 depicts the base year of 2028, please clarify if the WTE plant is operating at full capacity (4,000 tons per day), or the MSW tonnage generated within this service area at that time (since initially only three 1,000 ton per day WTE lines are needed for this system's MSW). Please show the likely scenario of MTC02e production when WTE is at full capacity (4,000 tons per day) and	The WTE facility is sized to reach capacity in year 20, not year 1 (2029). Operations would be most efficient when the facility is at or near full capacity. The WARM greenhouse gas estimates are calculated for a common base year in 2029.

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		presumed optimal capacity. What percentage of bypass wastes are counted toward the "landfill gas recovery" input, and is that factored in as an additional emission in this table?	
Federal Way	Chapter 6, pg 6-16	The WTE discussion indicates 'all' of this metal will be recovered. Please state the projected recovery rate.	The projected recovery rate is up to 50,000 tons of ferrous and non-ferrous metals. This would increase the County's overall recycling rate by about two percent.
Federal Way	Chapter 6, pg 6-16	Unless there are proven and cost-effective metals recovery methods, it may be more realistic to not count this 2% as a given outcome, and therefore omit this section. Are there examples of other WTE plants recovering metal in this manner and at the proposed scale of this WTE option, with data showing it economical to do so? How much does it cost per ton to recover this metal? Is that cost factored into the cost per ton projections? Is there even a cost-effective way to recover non-ferrous metals from slag and ash once it is subjected to high heat?	The two percent increase is based on the estimated metal content of our waste in 2029. The 2029 composition is calculated using the 2015 study of our waste characterization. The Normandeau report findings are based on Pasco County FL, and Spokane WA ferrous and non-ferrous metal recovery percentages of approximately 4% and 0.8% respectively when using advanced metal recovery systems on mixed municipal solid waste processed at those plants, (this would mean nearly 100% recovery for our waste that contains approximately 5% metal). The cost to recover the metal is included in the $21M of additive construction costs (Ash Equipment, Electric Interconnect, and Site) and the operating cost of $31.50 per ton. What portion of those costs are for metal recovery is not available from these planning level estimates. Yes the revenue and costs are factored into the cost per ton projections. Per the Normandeau report, the price per ton estimate for non-ferrous in 2028 is $888.46/ton for $7.4M dollars of annual revenue, the use of eddy

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		The Plan could benefit from a comparison regarding the cost-effectiveness of diversion/screening of metals before the WTE process.	current separators should effectively remove about 90% of the non-ferrous metals from the ash. Advanced material recovery system costs have yet to be developed for the Solid Waste Division system. This work is being considered as part of the new South County Recycling and Transfer Station.
Federal Way	Chapter 6, pg 6-17	Presumably the $229 million in capital costs won't be spent "as soon as" approval of cell construction occurs. It would instead be spent over the period of time during cell construction that creates landfill capacity until 2040. Please consider clarifying this period of time. This footnote appears to be the only text reference to "Area 9" in the Plan. There is an "Area 9" represented in Figure 2.5, but it is likely different than the area that would be used in expanding capacity to 2040, so please add explanatory text.	This table has been removed from the Plan.
Federal Way	Chapter 6, pg 6-17	It is not clear why the 2017 capital amount is higher than the future amount. Do these figures compare, or do they come from a different base?	This table has been removed from the Plan.
Federal Way	Chapter 6, pg 6-17	This note seems to indicate that the WTE option overbuilds initial capacity and requires waste import to run all four 1,000 ton per day lines. (It doesn't appear that the intent is to not start one of the 1,000 ton per day lines for several years). What is the year when our system-generated MSW provides sufficient input that makes it economical to begin operating that fourth line solely on waste generated within our system? (Presumably the fourth line is not started just for our daily MSW ton #3,001). At 4,000 tons per day, operating continuously, WTE would process over 1.4 million tons of MSW. While WTE facility downtime will mean a lower total tonnage will be burned in practice, Figure 3.3 doesn't show when that level of "tons disposed" will be reached – presumably it would be years past 2040. The	Yes, the WTE option initially is built to reach capacity in year 20. Bypass waste and ash would be exported throughout the life of the WTE facility. The operators of the WTE facility could seek outside waste until waste from our regional system uses the facility's full capacity. For year 21 and beyond, an additional decision would be needed to build additional WTE capacity, export any municipal solid waste beyond the capacity of the initial facility, or use alternative disposal approaches.

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		Plan would benefit from a chart showing the annual MSW consumption by the WTE site over time, including showing bypass waste tonnage (that would not go to the WTE plant but instead be exported by rail) at all phases of the lifespan of the WTE facility as proposed. It would also include a chart depicting annual waste import, by-pass waste export and ash export tonnages, as well as projected tip fee costs - at the beginning of the waste import phase, during the waste import phase, and then the phase where the WTE facility operates at 4,000 ton per day capacity with system-generated MSW. How much will it cost to arrange for inbound rail or truck capacity to enable contracting for this required waste import? It is unclear that other nearby MSW systems would select disposal capacity that tapers off - unless it is somehow cheaper than their current system. The Plan should explain why an outside MSW agency or system would seek to enter into a contract for "waste import" into our system when Figure 6-9 shows waste export is less expensive than WTE. Clarify if the County is considering having ratepayers subsidize the import of waste from outside the system, and if this also includes subsidizing the disposal costs for that waste's ash, and how much that subsidization would cost our system's ratepayers.	
Federal Way	Chapter 6, pg 6-19	The 2016 King County Comprehensive Plan (2016 Update) (King County 2016a) does not explicitly endorse "mass burn incineration" and instead supports looking at the potential for energy recovery from "select solid waste materials including organics, mixed plastics, and the non-recyclable portion of the waste stream". These options could be outlined in the "Technologies for Future" section of the Plan. The policy reads:	Thank you for your comment. Changes have been made to this section.

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		F-271a King County should consider whether opportunities to increase energy recovery from select solid waste materials including organics, mixed plastics, and the non-recyclable portion of the waste stream are beneficial in terms of cost, the natural environment, greenhouse gas emissions and community impacts, as well as whether any such energy recovery facilities might be more appropriately located outside King County.	
Clyde Hill	Chapter 6, pg 6-5	This is a lengthy chapter containing very important information. It is suggested that a summary be added that clearly addresses the issue of what is the expected life of the Cedar Hills Landfill over the following periods and the key assumptions (e.g., recycling rates) related to each. Current date through 2028. It is stated on page 6-5, "With permitted capacity at the predicted by to be used by 2028," What assumption is used for the recycling rate 57% or some other figure(s)? Current date through 2040. On page 6-9, it is stated "the added capacity would be sufficient to handle forecast tonnage so that the landfill would continue to operate at least through 2040. What assumption is used for the recycling rate 57% or some other figure(s)? See also comments related to Chapter 3.	Thank you for your comment. The tonnage forecast has been updated and a conservative recycling rate of 52% is assumed throughout the Plan based on Ecology's reported recycling rates from 2012 through 2014.
Federal Way	Chapter 6, pg 6-5	See comment above. A seven year time frame is sufficient for planning the transition to waste export as a disposal method (in accordance with current KCC Title 10 policy). Once adopted, this Plan could be amended to reflect any different disposal alternative(s) selected via the stakeholder process.	Thank you for your comment. Based on recent experience, seven years may not be enough time to be prepared, which is why it is important for a recommendation to be made in this Plan.
Federal Way	Chapter 6, pg 6-5	This phrase regarding cooperation with advisory committees is repeated twice, but it is not clear when this explicitly occurred, or if advisory committee input was fully considered in winnowing down options to these three future disposal methods.	Thank you for your comment.

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		In a departure from prior more collaborative and iterative processes, the County engaged in the Normandeau study without seeking substantive input and participation from advisory committees regarding the basis for the study, its cost and scope of work, or the outcomes sought. Ultimately this regional system is most equitable when Cities and advisory groups are enlisted as partners who are empowered to provide input in a timely manner.	
Federal Way	Chapter 6, pg 6-6	Please add the text below regarding benefits of conserving current permitted Cedar Hills capacity. Make it clear which practices (such as WRR) preserve landfill capacity and provide value by delaying or avoiding inevitable future costs. "A comparative evaluation of alternative disposal options (R.W. Beck 2007) that are compatible with increased recycling and capable of handling King County's waste while meeting applicable regulations indicates that disposal at Cedar Hills is the most economical way to handle King County's solid waste. It is significantly less expensive than the projected costs of other disposal options, including transporting waste to an out- of-county landfill or to a waste -to-energy or other waste conversion facility. By extending the life of the landfill and delaying the transition to a new disposal method, the county will be able to delay the unavoidable rate increases that will be needed to accommodate this transition." This section of the Plan should make a brief but clear distinction between the topic "current permitted capacity conservation" before discussing the steps and costs required to increase permitted capacity in the "Further Develop Cedar Hills" discussion.	Thank you for your comment. The Plan includes a recommendation to further develop Cedar Hills to maximize disposal capacity.

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Federal Way	Chapter 6, pg 6-7	The Plan should note that intermodal capacity could be shared, and that there is potential for cooperation among neighboring Counties and Seattle that could reduce rail costs or create other efficiencies of scale.	Thank you for your comment. The suggested edit has been made.
Federal Way	Chapter 6, pg 6-9	Please explain what happens if the opposite occurs and tons are lower than forecast. Typically a 'put or pay' cost structure applies to WTE facility economics, meaning if tonnage minimums are not met, penalties or payments are still assessed. If factors like the economy or WRR efforts mean there is not enough waste coming into the WTE plant to cover the bond costs and operation costs, or to operate at peak efficiency levels used in this Plan's projections, who pays for this shortfall? Note that WTE operations require a steady supply of MSW to maintain efficiency, and note that this is a drawback compared to disposal options that are more readily scalable (e.g., changes to the total number of rail cars that make up waste export trains is relatively benign).	Provisions to ensure that WTE facilities receive enough garbage usually are part of contracts for operating WTE facilities. The arrangements if the regional system produces insufficient garbage for efficient WTE operation have not been identified.
Federal Way	Chapter 6, pg 6-9	This disposal option should include all costs associated with operations. For example, the cost of transporting this ash and the associated tipping fee, as well as how the potential issues of waste export and even waste import (pertaining to rail capacity) still apply with the WTE option based on the initial capacity target of 4,000 tons per day. Provide an outline of related infrastructure (including intermodal rail capacity) required plus how ash will be conveyed to a rail head along with any bypass or non-processable wastes. Please show how the costs associated with these integral WTE operations have been factored into this plan, in order to allow a more complete comparison among options.	WTE costs, which were based on Normandeau 2017 included the cost of ash export and export of MSW during scheduled facility maintenance. Import of MSW from outside King County was not included in the costs.

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		Additional explanation should be added for how wastes would be managed when WTE plant experiences mechanical failure or "down time", plus what the related costs are and how they are factored into the price of this option, noting the associated impacts scaled with the potential concerns raised about rail capacity related to waste export.	
Greater Maple Valley UAC	Chapter 6, Policies D-1 – D-4	We support these Policies with the ultimate goal being to not have to expand the Cedar Hills Landfill. We do not support the expansion of the Cedar Hills Landfill as a stop-gap solution solely to delay the inevitable day that its capacity is reached and simply defer the selection and implementation of an alternative permanent waste handling and disposal system.	Thank you for your comment.
Greater Maple Valley UAC	Chapter 7	Consumers should continue to pay for the waste they generate and receive credit for the amount recycled and, thus, kept out of the waste stream. Incentives will continue to be important here.	Thank you for your comment.
Woodinville	Chapter 7	Woodinville supports recommended actions 1-f through 16-f on the topic of finance. Woodinville believes it is especially important to include sufficient funding for mitigation to cities directly impacted by solid waste facilities pursuant to RCW 36.58.080.	Thank you for your comment.
Zero Waste Vashon	Chapter 7 - Environmental Economics P 7-1	Practicing "environmental economics" is key for our society to establish a true and more equitable economic value of what we consume. Whether it is the implementation of a carbon tax or creating markets for recycle, King County Solid Waste is a major engine towards implementing this concept, and we should utilize it to press forward.	Thank you for your comment.
Dano Rustrom	Chapter 7 - Finance	Keep costs as low as possible.	Thank you for your comment.
Washington Utilities and Transportation Commission	Chapter 7 - General	The Washington Utilities and Transportation Commission (Commission) has completed its review of the cost assessment questionnaire for the draft of the King County Comprehensive Solid Waste Management Plan (Plan), submitted Janurary 9, 2018.	Thank you for your review of the Draft Comprehensive Solid Waste Management Plan.

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		The cost assessment questionnaire in the Plan proposes three tip fee increases at all King County transfer stations during the 2017 – 2022 Plan period. The tip fee increase in 2017 has already been in effect for over a year, while the other two tip fee increases are projected to take effect in 2019 and 2022. As a result, there will be a rate impact to ratepayers served by regulated solid waste collection companies in King County in years 2019 and 2022. This is illustrated in the table shown on the following page. (see original letter) Staff has no further comment on the cost assessment questionnaire.	
Bellevue	Chapter 7, Fee structure	In Chapter 7, the Plan discusses the possibility of potential changes in the solid waste fee structure. The Plan should clearly articulate that the MSWMAC has a role in providing input and feedback to the County when changes to the rate structure are contemplated. Additionally, additional clarification should be included regarding what aspects of the rate structure could be changed. *Requested change (p.7-9):Add an explicit reference to MSWMAC's role in providing feedback to the County when changes to the rate structure are contemplated and provide more detail regarding the types of rate structure changes that may be considered.*	Thank you for your comment. The change has been made.
Federal Way	Chapter 7, pg 7-10	This was the conclusion of the 2007 Beck study, so consider revising the text so it says that the preliminary recent study appears to reaffirm this conclusion. This would avoid an impression that this is newly revealed or 'preliminary' information.	Thank you for your comment. The suggested edit has been made.
Federal Way	Chapter 7, pg 7-8	Please add to this sentence: "...since it delays making the transition to other more costly disposal options."	Thank you for your comment. The suggested edit has been made.

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Clyde Hill	Chapter 7, Potential Changes in the Fee Structure (page 7-9)	At two meetings of MSWMAC this summer, Solid Waste staff discussed the possibility of revising the methodology for the calculation of tipping fees by adding a new component related to volume (in addition to a charge for weight or tonnage). It is agreed that there is strong logical support for considering such a change since many of the costs incurred by Solid Waste are driven by volume (as opposed to weight) such as handling costs, transportation costs and most importantly landfill costs. However, there are significant drawbacks to this proposal including: 1. It is much more difficult to measure volume than tonnage accurately. 2. The additional processing could impact wait times, personnel requirements and require additional equipment. 3. There may be "equity" issues due to differences in degree of compacting. For example, commercial haulers may carry residential waste that is partially compacted. Self-haulers waste in general is not compacted. 4. The billing process would become more complicated and potentially confusing to users (am I being double charged). Since these changes are not included in this section, are we to conclude that this proposal is off the table since it is not practical?	Although the Plan would allow a future change, at this time, the Division is not proposing to revise the fee structure. More discussion with our partner cities will need to take place before this change would be possible.
Zero Waste Vashon	Common Terms pg xi	*Common Terms p. xi:* add several terms & their definitions such as **biosolids-** organic matter recycled from sewage sludge, especially for use in agriculture, **biochar-** charcoal made from the slow burning of biomass in the absence of oxygen	Thank you for your comment. We have added these terms to the Common Terms section.

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		and may be the key to solving many problems we humans face resulting from natural and induced changes in climate, urban and agricultural development, population growth, etc., **vector**- organism that does not cause disease itself but which spreads infection by conveying pathogens from one host to another, such as mosqu tos and vermin.	
Puget Sound Clean Air Agency	Composting/ Air quality	Finally, in the Draft SWMP, Alternative 3 of the Sustainable Materials Management indicates that it would expand recycling to include curbside yard waste pickup to all residences in King County, including those in unincorporated King County. The Agency supports that goal as it links to our goals to eliminate residential burning of yard waste and brush to satisfy statutory requirements. However, our support for this goal does not alter our strong interest in seeking real improvement in the air quality impacts from organics recycling operations. We believe that we should be seeking a way to meet all of our environmental objectives.	Thank you for your comment. The division will be working with stakeholders to determine how to provide more processing capacity for organics so that odor concerns can be addressed.
Zero Waste WA	Definition	Definition of compost: We recommend updating the definition to match the new definition adopted by The American Association of Plant and Food Control Officials: *Compost – is the product manufactured through the controlled aerobic, biological decomposition of biodegradable materials. The product has undergone mesophilic and thermophilic temperatures, which significantly reduces the viability of pathogens and weed seeds, and stabilizes the carbon such that it is beneficial to plant growth. Compost is typically used as a soil amendment, but may also contribute plant nutrients.*	Thank you for your comment. The definition included in the Plan is derived from KCC Title 10 and RCW 70.95.030.
Zero Waste WA	Definition	Definition of leachate: We recommend that the definition of leachate be clarified to indicate that the water percolating through the landfill has the ability to pick up contaminants.	Thank you for your comment. Your suggested edit has been made.

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Impact Bioenergy (Jan Allen)	General	Impact Bioenergy is based in King County and is a well-recognized international leader in small prefabricated portable food waste anaerobic digestion (AD) technology. The company was awarded a Washington State Clean Energy Fund Grant to build and operate a merchant commercial food waste AD facility on Vashon Island. Our private enterprise business model relies on three value streams to finance and sustain operations: a tip fee for organic waste recycling, the sale of renewable energy, and the sale of probiotic plant food derived from digested food waste. We are at great risk in this endeavor if we cannot secure a tip fee at a minimum equivalent to the present MSW tip fee at the County Transfer Stations. Decentralizing has the advantages of less trucking, less diesel fuel use, less traffic congestion, less odor issues at outdoor composting facilities, more building of a sense of community, and diversifying the number of organic fertilizers and soil projects made from recycled organics. Yet decentralizing has less economy of scale. We encourage and request King County to: • Continue supporting demonstration projects focused on source separated organics with financial grants • Increase the budget for demonstration, research, and market development grants • Implement a transfer station rate for clean source separated organics • Implement a location in each transfer station for transferring clean source separated organics • Implement a policy to the County to divert both tons and the associated tip fee for those tons to private	Thank you for your comment.

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		sector demonstrations on a case-by-case pilot basis. For example, on Vashon Island where the State has already invested in an innovative demonstration. • Institute a competitive process for private sector companies to process clean source separated organics. Selection should be based on price as well as food system benefits, local community benefits, and reduced carbon footprint. • Coordinate King County's LOOP program with a new *King County Urban Organics Circular Economy* program with similar objectives and messaging. These programs are synergistic and compatible. • Consider a mobile store for the sale of King County origin recycled-content products • Consider a kiosk or popup point of sale at transfer stations at non-peak periods for the sale of King County origin recycled-content products.	
King County Road Services	General	King County Road Services appreciates the opportunity to review the draft Comprehensive Solid Waste Management Plan and EIS. We are very interested in ongoing coordination and collaboration between Roads and the Solid Waste Division on issues that may affect unincorporated King County roads and bridges, including the following: • Siting of transfer stations or other facilities • Traffic volume and vehicle we ght information, which are key for understanding and quantifying impacts on unincorporated area roads and bridges. Weight information is especially critical for aging bridges on certain roads/bridges.	Thank you for your comment. SWD looks forward to working with the Roads Services Division in future projects, as well as coordinating in on-going business.

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		• Rail transport, including impacts of waste export on unincorporated area roads between transfer stations and rail facilities • Continued collaboration on Illegal dumping issues in unincorporated King County road right of ways	
Bellevue	General	As the Plan's intent is to establish "strategies for managing King County's solid waste over the next 6 years, with consideration of the next 20 years," it is critical that the Plan reflect the interests of the communities within the County's solid waste system. As previously communicated in its November 3, 2017 comment letter on the preliminary draft Plan, Bellevue's key solid waste interests are generally reflected in legislative actions taken by the King County Council in October 2017. The Plan should accurately reflect these recent actions. Specifically, on October 10, 2017, the King County Council took legislative actions that 1) cancelled demand management; 2) committed the County to planning for needed northeast King County transfer station capacity outside of Bellevue; and 3) established that there would be no further expansion of the Factoria Transfer Station and committed to the timely surplus of the upper Eastgate Way property. On October 30, 2017, Bellevue signed the Amended and Restated Solid Waste Interlocal Agreement (ILA) with King County. Bellevue signed the ILA with the expectation that King County fulfill its duties as prescribed in these recent legislative actions and look to serve the county's future solid waste demands through financially prudent and geographically equitable strategies. Bellevue is concerned that the Plan as drafted falls short of these expectations,	Thank you for your comment. The Plan includes recommendations to build a new northeast recycling and transfer station and to further develop Cedar Hills to maximize disposal capacity.

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		particularly as the Plan fails to identify preferred alternatives for future transfer capacity and future disposal capacity. As currently drafted, the Plan leaves significant uncertainty regarding which options will be selected for meeting future transfer and disposal capacity needs. Without knowing the selected alternatives, Bellevue cannot endorse the Plan. Additionally, the Plan should clearly state the member jurisdiction role in rate planning.	
Federal Way	General	Regarding the on-line survey accessed via kingcounty.gov/depts/dnrp/solid-waste/about/planning/comp-plan.aspx. We appreciate the accessibility of this survey to foster general public input. However, its survey results are anecdotal and not statistically valid, so results should not be reported or used in ways that improperly influence the overall planning process and the Comp Plan recommendations.	Thank you for your comment
Kirkland	General	As a participant in the King County solid waste system and host city to the Houghton Transfer Station for over 50 years, the City of Kirkland is acutely interested in ensuring that the draft recommendations, policies, goals, and actions included in the Plan both individually and collectively contribute toward making future transfer and disposal services accessible, affordable, equitable, and sustainable and are supportive of the region's diversion and waste prevention aspirations. As the Plan will be the roadmap for the future of our solid waste system, we would like to express our desire that the King County Executive make final recommendations on both transfer system alternatives and disposal alternatives in the Plan transmitted to the King County Council. We strongly encourage that the recommendations are succinct, free of ambiguities, and reflective of, and directly derived	Thank you for your comment. The Plan includes recommendations to build a new northeast recycling and transfer station and to further develop Cedar Hills to maximize disposal capacity.

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		from, information and empirical data presented in the Plan and from comments received from cities and the public.	
Kathy Lambert	General	This letter and the attached marked up copy of the Draft Comprehensive Plan constitute my official comments. The final report should be integrated and not siloed. The items that cannot be recycled should be put in a modern waste to energy plant, so they are recycled in that manner, produce power and dispose of the matter so it is not left for future generations to deal with.	Thank you for your comments. Unlike the last adopted Comp Plan, this Plan includes a new chapter, Chapter 2 The Existing Solid Waste System. This chapter discusses how the entire system works together while later chapters focus on specific parts of the system such as sustainable materials management, transfer, and disposal.
Kathy Lambert	General	There should be a sustainability model wherein biosolids are also used as fuel. There are toxins and pharmaceuticals in biosolids. The impact of the combinations of all these chemicals is unknown and leaves our land with potential for contamination. The European Union does not allow lands application of biosolids. We need to follow their example.	King County returns the valuable nutrients and carbon from biosolids – a nutrient-rich organic product of wastewater treatment – to the land as a soil conditioner for agriculture and forestry. A portion of the biosolids are also composted by a private company and sold as compost for use in landscaping and gardening. These approaches contribute to sustainability by using biosolids to enrich soils, keeping them productive and healthy.
Kathy Lambert	General	The lifecycle of our recycled products should be documented. When we ship some recycled products to China and other places we have no idea how they are being reused or disposed of. It is not true recycling if we don't know the outcome of the materials.	The regional system relies on public and private participants, with private collection and processing companies responsible for ensuring that recyclable materials are reused under their contracts with the cities and county. For example, the division's contract for processing of recyclables from county transfer stations states "The Contractor shall ensure that all of the recyclable materials collected from SWD sites are recycled per King County Code [KCC 10.04.020 DDDD], which specifies that recycling of materials includes transforming, remanufacturing, reprocessing, composting or re-refining materials into usable or marketable products, and marketing or distributing those products or commodities for

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			use other than landfill, incineration, stockpiling, or as a fuel..."
Kathy Lambert	General	The new announcement by China that they are not going to use as much or potentially any of our recycled products could have an impact on our recycling rate and potentially increase the materials that will go into our landfill. One of their- concerns is that our separation methods allows for contamination of the materials I have seen very different sorting methods in Germany and Denmark, which produces a cleaner product to be on the market and compete with our recyclables.	The regional approach to separation of curbside recyclables has evolved. Some materials were collected in separate bins when local recycling programs first began. Since the early 2000s curbside recyclables have been collected in one bin and the co-mingled recyclables brought to Material Recovery Facilities to be sorted, baled, and sold to be made into new products. The one-bin approach greatly increased the regional recycling rate but it relies on customers making the right choices about placing in their blue bin only materials accepted by their jurisdiction's recycling program that are empty, clean, and dry. The division and its advisory committees have convened a Responsible Recycling Task Force to explore reducing contamination through more recycling consistency among jurisdictions, and customer reminders about recycling best practices, and other means.
Kathy Lambert	General	Many of the suppositions given in this draft report need to be reconsidered. For instance the tonnage capacity of a waste to energy plant does not need to be built at the beginning for anticipated tonnage over the next 20 years. We have no way of knowing what changes will happen in packaging, regulations, recycling, reuse, etc. So building so much extra capacity is not necessary. We should model after waste to energy plants in Florida and Hamburg. They provide us with a clear, documented data system that is sustainable and we can measure the environmental impacts in a much more accurate and efficient way than landfills.	Various choices regarding the size of a waste to energy plant were offered in the Normandeau 2017 report. Given the lengthy siting and construction process and need for disposal certainty over a reasonable time period, the waste to energy option assumed a facility that can handle county tons for at least 20 years before reaching capacity, after which an additional waste to energy plant or other disposal option would be needed. Twenty years also is more consistent with the plan's planning horizon and allows comparison of the three disposal options over roughly the same time period.
Kathy Lambert	General	Our landfill is quickly filling up. Going up another 50 feet will have impacts on the surrounding neighborhoods and on costs.	The Further Develop Cedar Hills option would increase the landfill height 30 feet over the currently permitted height. The cost of increased height is

Responsiveness Summary: Responses to formal comments made during the January 8 – March 8, 2018 public comment period

Commenter	Public Review Draft Chapter & Page Number	Comment	Response (Page numbers refer to the 2019 Plan)
			included in the costs for the Further Develop Cedar Hills option.
Kathy Lambert	General	The comparison numbers for a new cell have a range that is stated at its lowest number while the comparison of a waste to energy plant is compared at its highest price range.	Capital and operating costs for the disposal options in Chapter 6 of the public review draft Comp Plan (January 2018) are presented as single numbers for each option instead of ranges. Costs for the Further Develop Cedar Hills options were estimated by the division. Costs for the waste to energy option were taken from the Normandeau 2017 report that presented credible waste to energy costs drawing on recent information and the consultant's many years of experience with waste to energy facilities.
Kathy Lambert	General	Taking the materials by rail is an expensive and uncertain option. We already know there are times when the rails are over capacity and we have no control over the long term costs. A waste to energy plant contains the materials and disposes of most of the matter here and provides certainty and predictability.	Chapter 6 Table 6-2 shows the waste export disposal option to be more expensive than further develop Cedar Hills option but less expensive than the waste to energy option. Page 6-10 of the public review draft plan notes potential capacity constraints identified by the Washington State Department of Transportation and Normandeau 2017.
Kathy Lambert	General	If we built a waste to energy plant now, it would allow us to use our current capacity to accept the fly ash until we can update our codes to be in line with European standards and science to declare it inert. Flyash is also needed in cement and there would be a market for it. In addition, our bottom ash could be used for road construction. Our 1,500 miles of roads are in need of repair and in places reconstruction. Having this readily available product for road bed would be another asset.	Under Washington State Special Incinerator Ash Standards (Chapter 173-306 WAC) ash must be disposed separately from municipal solid waste in a special ash monofill. Although standards could change in the future, waste to energy ash is not currently approved in Washington for other uses such as roadbed material. Because Cedar Hills is permitted as a municipal solid waste landfill, the engineering, permitting, and financial feasibility of building an ash monofill on the site would need further evaluation. The public review draft plan assumed that the ash would be exported to an existing out of county ash monofill.
Kathy Lambert	General	The metals would be recycled, which would help our environment too.	The plan recognizes that more metals could be recycled with the waste to energy option. The potential to increase recycling by as much as two

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		As we go forward we need to see how we can integrate our system and use these materials for power, for sale to other industries such as the cement industry and metals for reuse. There are many byproducts that are sold from the Hamburg facility. Science continues to develop new ways to use these byproducts and offset our costs.	percent by recovering metals from waste to energy ash is shown on Page 6-9 and Table 6-2 in the public review draft plan.
Kathy Lambert	General	To summarize, I am requesting the following overall changes, in addition to the detail changes in my marked up draft: • Comprehensive, system wide information that is integrated (not siloed) so the reader understands both the different system segments AND how they function as a system.	Unlike the last adopted Comp Plan, this Plan includes a new chapter, Chapter 2 The Existing Solid Waste System. This chapter discusses how the entire system works together while later chapters focus on specific parts of the system such as sustainable materials management, transfer, and disposal.
Kathy Lambert	General	• Information on the lifecycle of recycled products.	The regional system relies on public and private participants, with private collection and processing companies responsible for ensuring that recyclable materials are reused under their contracts with the cities and county. For example, the division's contract for processing of recyclables from county transfer stations states "The Contractor shall ensure that all of the recyclable materials collected from SWD sites are recycled per King County Code [KCC 10.04.020 DDDD], which specifies that recycling of materials includes transforming, remanufacturing, reprocessing, composting or re-refining materials into usable or marketable products, and marketing or distributing those products or commodities for use other than landfill, incineration, stockpiling, or as a fuel..."
Kathy Lambert	General	• Discussion of available system improvements or technological advancements that can maximize recycling and minimize landfill use (including waste to energy, byproduct sale to industry, etc.)	Maximizing recycling and diverting materials from the landfill are discussed in Chapter 4 Sustainable Materials Management. Technologies that could recover resources and further divert materials from the landfill are discussed in Chapter 6 Landfill Management and Solid Waste Disposal.

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Kathy Lambert	General	• Analysis of global markets and foreign actors and how their decisions could impact local recycling rates, system capacity, and landfill use.	Discussion of China's recent restriction on import of recyclable materials (sometimes called the China National Sword policy) has been added Chapter 4.
Kathy Lambert	General	• An appendix of source materials for all conclusions made or assumptions used to reach a conclusion.	References used in developing the plan are listed in Chapter 8.
Kathy Lambert	General	In the report, they did not consider many of the known cost offsets in a waste to energy facility. There are a variety of statements in the report that are incomplete or debatable.	Cost offsets (including revenues from sale of recyclable materials and electricity) identified in the Normandeau 2017 report were included in the waste to energy cost estimates shown in the public review draft plan.
Kathy Lambert	General	In addition to this letter, the attached document provides my in-depth comments through a marked up version of the Draft Solid Waste Comprehensive Plan.	The marked up document referenced in the letter was the Draft Environmental Impact Statement for the Draft Comprehensive Solid Waste Management Plan. Because the mark-ups do not directly address the text in the public review draft plan, the detailed responses to the marked-up document are shown in the Responsiveness Summary for the Final Environmental Impact Statement.
Meghan Brookler	General	In order to provide King County and its Citizens with the most economic and environmentally viable options, the following corrective actions need to be taken: Stop the finalization of the Current Draft Solid Waste Management Plan and Draft Environmental Impact Statement; Conduct a detailed Feasibility Study by a Team of qualified national and international experts; Move forward with and Integrated System that reduces its Global Warming Effect and moves our waste system from a liability to an asset; Engage proven technologies and systems that create local jobs; Reduce the overall environmental impact, provide innovative mitigation measures, and contribute to a circular economy;	Thank you for your comment.

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Commenter	Public Review Draft Chapter & Page Number	Comment	Response (Page numbers refer to the 2019 Plan)
		Handle, process and utilize the waste where it is produced: locally; Include wastewater residuals and biosolids (sewage) in the solid waste treatment program. Proven thermal treatment technology is the most effective way to destroying the toxics contained in biosolids/sewage such as flame retardants, heavy metals, dioxins and furans etc.; Include Anaerobic Digestion for the 50% biogenic content.	
Meghan Brookler	General	In summary, the Solid Waste Department did not accurately incorporate the potential and viable options that have been recently studied nor did it provide economic- environmental viable solutions. Waste-to-Energy, Anaerobic Digestion and an overall Integrated Resource Management Plan are viable options for King County but were misrepresented in the DEIS. Based on the studies, these options will provide more benefits, environmentally sound technologies that adequately destroy the toxic organic components contained in the waste and biosolids, while reducing the impact of air and ground pollution compared to landfilling. The DEIS is not thorough, is technically inaccurate, and not legally defensible due to the poorly written Draft Solid Waste Management Plan. Both the DSWMP and DEIS need to be stopped and comprehensively rewritten. The new plans need to be prepared based on viable, credible scientific facts and complete documents.	Thank you for your comment.
Zero Waste WA	General	Zero Waste Washington appreciates the opportunity to comment on King County's draft *Comprehensive Solid Waste Management Plan* update, dated January 2018. The plan is an important document guiding management of our garbage and recycling for the next six years in detail and 20 years generally. Zero Waste Washington is a nonprofit group that represents the public on recycling and zero waste issues. We work to protect people and our natural world by advocating for products designed and produced to be	Thank you for your comment.

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Commenter	Public Review Draft Chapter & Page Number	Comment	Response (Page numbers refer to the 2019 Plan)
		healthy, safe, and continually recycled and reused. We envision a just and sustainable world where society responsibly produces, consumes and recycles. We applaud the overall approach and the waste prevention hierarchy. We are concerned, however, that the recycling rate has plateaued. We would like to see much stronger policies and actions in the plan to stimulate increasing the recycling rate (even though there is a challenge with the China Sword initiative at the moment).	
Zero Waste Vashon	General	The CSWMP presents a very detailed analysis of the recent status, challenges, and proposes several alternatives for future development and how King County deals with solid waste, recycling, and related issues. The main challenge centers around the Cedar Hills Landfill Facility capacity and projected life based on estimated waste volumes in the coming decades. ZWV is proposing that King County prioritize a de-centralized waste management approach which uses an integrated Regional - Distributed system. In order to reduce waste going to the central landfill, ZWV recommends that King County improve and expand the existing waste disposal / recycling infrastructure to increase local recycling rates, divert more organic materials to existing and new distributed local composting and anaerobic digestion systems, and greatly expanding waste diversion approaches such as ReUse facilities. Increasing the number and accessibility of local facilities will decrease overall waste transportation costs, road congestion and wear, greenhouse gas production and waste volumes needing disposal at the Cedar Hills Landfill.	

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		Vashon & Maury Island with its mix of neighborhoods, farms, and rural areas, presents an ideal location for new distributed aerobic composting, anaerobic digestion (AD), or Re-Use facilities for application elsewhere in King County and the region.	Thank you for your comments.
		ZWV strongly support CSWMP policies that positively affect the following: • Increased Recycling Rates on Vashon : the new commingled blue bin for curbside collection has been a positive step forward for the Island community, however a majority of Islanders still "self-haul" their garbage and recycling to the Vashon Recycling & Transfer Station. Improvements at the Transfer Station are needed to facilitate easier recycling and separation of garbage and recycling by self-haulers.	SWD continually looks for ways to improve recycling.
		• Improved Services at the Vashon Recycling & Transfer Station including : Food Waste Collection, Construction and Demolition Debris collection, Clean Wood Recycling, Electronics Recycling, Re-Use Site for collection of reusable construction materials (windows, doors, lumber, lighting fixtures, plumbing hardware,...)	Food waste collection has been provided at the Vashon Recycling and Transfer Station since 2016. Other materials are evaluated as space configurations can be identified that are safe and allow for efficient vehicle movement.
		• A KCSW funded feasibility study to evaluate and design an Island Compost Facility to handle both Yard Waste and Food Waste. Currently Vashon Island only recycles Yard Waste brought to the Transfer Station by self-haulers. This material is collected and then transported off island to the Cedar Grove Compost facility in East King County. An on island facility would be more economical and effective for Aerobic Composting of Island Yard & Food Waste.	SWD agrees that an on-Island processing facility would be ideal. Cost and space are constraints as well as little assurance that should such a facility be developed that residents will pay to keep it viable. SWD plans to study the feasibility of options to manage organics generated on Vashon

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		• Curbside Collection of Organics (Yard & Food Waste) : As a potential future option to supplement current Yard Waste recycling at the Transfer Station, ZWV strongly recommends the study and evaluation of an Organics collection program to increase Yard / Food Waste recycling and supplement the feedstock for the proposed Island Compost Facility.	SWD periodically evaluates whether curbside food waste service would be used by customers.
Seattle-Tacoma International Airport (Port of Seattle)	General	Thank you for providing the opportunity to comment on King County's Draft Solid Waste Management Plan. Seattle-Tacoma Airport (SEA), owned and operated by the Port of Seattle, and located in the City of Seatac (City), provides airport facilities and services to meet the region's commercial and air cargo transportation needs. SEA is the primary commercial generator of municipal solid waste operating in the City and per WUTC regulations, relies exclusively on City contracted solid waste services that use King County's Bow Lake Solid Waste Transfer Station. To date, City and County solid waste services have served SEA with consistent, reliable, and responsive solid waste collection and disposal services. We appreciate collective efforts of City and County staff and applaud your progressive stance on Waste minimization as evidenced in this plan. SEA supports King County's proposed 70% waste diversion goal, which aligns closely with our own goal (60%). SEA also recognizes that achieving our waste diversion goal requires robust secondary material markets, access to material recovery services, and collaboration with Municipal and Regional partners. In light of those dependencies, SEA offers the following comments and welcomes future discussions regarding potential partnerships, pilot studies, or supportive efforts.	Thank you for your comment.

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Responsiveness Summary: Responses to formal comments made during the January 8 – March 8, 2018 public comment period

Commenter	Public Review Draft Chapter & Page Number	Comment	Response (Page numbers refer to the 2019 Plan)
Zero Waste WA	General - Format	While the plan includes a great deal of informative narrative, the connection of description to Actions is unclear and a little confusing. It would be much easier to digest, as a policy document, if the text that describes each action could be placed below each action.	Thank you for your comment. The Plan is organized with a reference to the page number where background discussion of the action can be found.
Kirkland	General - LHWMP	The City of Kirkland appreciates the work the Local Hazardous Waste Management Program (LHWMP) has done to reduce the impacts of moderate risk hazardous wastes on our environment through providing our residents and businesses with a reliable, safe, and responsible disposal option through a permanent drop-off location at the new Factoria Transfer Station and through periodic Wastemobile visits to the northeast County. In February, through the Sound Cities Association, the Kirkland City Council and staff were made aware of and surprised by a proposed 50.4% increase in the LHWMP fee schedule charged via a flat fee to our residents and variably to businesses based upon their service levels. As proposed, the fee increase would take effect in 2019 and be implemented incrementally over a six year period. The proposed increase also adds to the per-ton fees charged to private and commercial haulers at all transfer stations which has a direct impact on the rates cities charge to their customers. We have serious concerns about the general lack of communication and transparency on the part of LHWMP to its cities with solid waste interlocal agreements concerning the fee increase and the apparent lack of any tangible or meaningful improvement in services provided to our ratepayers in NE King County. The City of Kirkland strongly encourages the KCSWD and LHWMP to regroup and consider a less expensive, shorter term rate proposal that runs concurrent with the two-year King County biennial budget.	Thank you for your comment. The division has sent these comments to Lynda Ransley, LWHMP Program Director.

Responsiveness Summary: Responses to formal comments made during the January 8 – March 8, 2018 public comment period

Commenter	Public Review Draft Chapter & Page Number	Comment	Response (Page numbers refer to the 2019 Plan)
		We also ask that the County reassess the governance structure of the program to ensure that the 39 cities served by the program are better represented on the Management Coordination Committee (MCC) where rate proposals are voted on and recommended to the King County Board of Health for approval.	
Kirkland	General - LHWMP	Finally, we request that LHWMP provide a more detailed accounting of its proposed budget, cost drivers, and service improvements included in its proposed increase and do so through a robust public communication and engagement process well in advance of final consideration and adoption of the new fee schedule.	The division has sent these comments to Lynda Ransley, LHWMP Program Director.
Zero Waste Vashon	REFERENCES (8)	Site more references please, tying in previous work/vetted reports already done. An example is the compost feasibility study conducted by KCSW (in 2006?) should be noted.	Thank you for your comment. Although the division has completed many studies, we tried to cite the more recent studies in this Plan.

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Appendix F

Descriptions of Disposal Options Considered

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Options Considered for King County's Next Disposal Method

The division used information on waste disposal options from the *Conversion Technology Report* (R.W. Beck 2007), the *Waste-to-Energy Study (Normandeau 2017)*, and an updated *Cedar Hills Site Development Alternatives Final Report* (KCSWD 2017a) to identify three options to meet the county's disposal needs after currently permitted capacity at Cedar Hills is used. A long-term disposal method was selected from the following three options:

- Further develop Cedar Hills,
- Waste Export, and
- Waste to Energy (Mass Burn) Facility.

Further Develop Cedar Hills

This option would further develop Cedar Hills to maximize disposal capacity, extending the county's 50-year practice of managing its waste locally. To account for emerging technologies, the next disposal method would not be specified, but criteria would be established for selecting the next disposal method. This option is consistent with county policy to maximize the life of the Cedar Hills landfill. *The Conversion Technology Report* (R.W. Beck 2007) and more recent division analysis concluded that Cedar Hills disposal is the most economical way to handle King County's waste. Other advantages include the division's experience in landfill operation, availability of space in a county-owned landfill with state of the art environmental controls, and collection of landfill gas to produce renewable energy. Challenges with this option include obtaining new or modified permits to authorize further development, relocating buildings to make room for refuse, and continuing to be good neighbors for the surrounding community.

Features used in the re-evaluation of this option include:

- New landfill cells would be developed at the Cedar Hills landfill,
- The permit and the landfill would be modified to increase the height of the landfill from approximately 800 feet to 830 feet, to the extent that such modification would be consistent with the terms and conditions of the Settlement Agreement, which requires King County to make a good faith effort to keep the maximum height of areas 5, 6, and 7 of the Landfill at or below 788 feet above sea level,
- Division facilities currently located in areas permitted for refuse disposal would be moved,
- High-efficiency collection systems would continue to deliver landfill gas to the Bio-Energy Washington facility, resulting in pipeline-quality natural gas, revenue for the division, and reduced greenhouse gas emissions,
- The added capacity would be sufficient to handle the forecast tonnage, maximizing disposal capacity at the landfill,
- Consistent with long-standing practice, new development would be financed through rate revenues managed in the landfill reserve fund,
- As Cedar Hills reaches capacity, previously described evaluation criteria would be used to select the next disposal method, and
- A new disposal method would need to be ready for service when the new capacity at Cedar Hills is exhausted.

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Waste Export

This option would export waste to an out-of-county landfill after currently permitted capacity at Cedar Hills is used in 2028. Current county policy establishes export to an out-of-county landfill as the choice for disposal after closure of the Cedar Hills landfill. Waste export by rail is a proven disposal option used by neighboring jurisdictions, including the City of Seattle and Snohomish County. There are several regional landfills available by rail with combined capacity sufficient to handle the county's waste in the long term. (Table 6-1)(KCSWD 2017c). This option would transfer a significant portion of the County's waste management activities into the private sector for long haul and landfilling. Challenges include modifying transfer stations for rail-ready transport, cost, lead time needed for contracting and division operational changes, and potential rail service disruptions that might arise from rail capacity constraints and weather events.

Features of this option include:

- The county would enter into a contract to export waste after current permitted capacity at Cedar Hills is used by 2028,
- Waste would be exported to a yet-to-be determined out-of-county landfill,
- The out-of-county landfill would produce energy from landfill gas using an efficient collection system,
- The county would negotiate revenue sharing or energy credits with the out-of-county landfill for the county's share of waste that produces landfill gas that is then harvested for energy,
- Waste would be transported to the out-of-county landfill by rail, the preferred transport mode, based on travel time, equipment requirements, payload, and capital costs (KCSWD 2017c),
- The division would buy container-ready trailers to transport rented rail-ready containers from transfer stations to a rail intermodal facility,
- The division would modify its transfer stations so that municipal solid waste can be loaded into railroad shipping containers, and
- The division would contract for an intermodal facility to transfer containers from trucks to rail.

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Table 6-1. Potential locations for out-of-county landfill disposal

Landfill Name	Location	Owner	Miles from Seattle	Waste-to-Energy	Total Permitted Capacity (tons)	Remaining Capacity (2013, *2016)	Opening Year	Estimated Closure
1. Columbia Ridge Landfill and Recycling Center	Gilliam County, OR	Waste Management	325	12.8 MW gas-to-electricity; plasma gasification demonstration plant.	354,275,000	329,000,000*	1990	2150+
2. Roosevelt Regional Landfill	Klickitat County, WA	Allied Waste Industries dba Regional Disposal Co.	330	20MW gas-to-electricity co-generation facility[a].	244,600,000	120,000,000*	1990	2110+
3. Finley Buttes Regional Landfill	Morrow County, OR	Waste Connections	352	4.6MW gas-to-electricity; co-generation facility.	158,900,000[b]	131,000,000*	1990	2250+
4. Simco Road	Elmore County, ID	Idaho Waste Systems	628		210,000,000[c]	200,000,000	2000	2100+
5. Greater Wenatchee Regional Landfill	Douglas County, WA	Waste Management	157	Planned gas-to-electricity, initially 1.6 MW expanding to 3.2 MW	42,000,000	36,000,000	1960	2110+

a Co-generation facility captures waste heat from burning landfill gas in gas turbines, and uses it to make steam to generate more power in a steam turbine. The water used to produce steam is continually cooled, condensed and reused The co-generation facility captures waste heat from the gas-to-electricity plant for use by an adjacent property owner.

b Finley Buttes has the potential to expand to a permitted capacity of 400 million tons.

c Simco Road Regional Landfill is currently expanding to a permitted capacity of 420 million tons.

Waste to Energy Facility

Under this option, current permitted capacity at Cedar Hills would be exhausted in 2028 and then all of the region's municipal solid waste would be directed to a waste to energy facility built in King County. As discussed previously, a recent study identified a mass burn facility as the best waste to energy technology for consideration by King County (Normandeau 2017).

This option would reduce waste 90 percent by volume and 75 percent by weight, while offsetting some costs through sale of electricity and increasing recycling by as much as two percent. Challenges include facility siting, cost, providing guaranteed amounts of feedstock, having unused capacity at the beginning of the operating period with potential inefficient operation during periods when less capacity is used, possible shutdowns due to waste deliveries below the system's requirements, rail capacity constraints for ash and bypass waste export, and other factors.

Features of this option include:

- For the first 20 years of operation (2028-2048), the facility would be designed to minimize waste that bypasses the facility because it is too bulky or exceeds facility capacity, resulting in a 5,000 tons-per-day plant built on a 40-acre site with five lines that could handle 1,000 tons per day each,
- To handle forecast tons, additional capacity would be required beyond 2048, or sooner if the actual tonnage increases faster than forecast,
- The mass burn facility would include a tipping floor, pre-incineration screening of non-processable materials at transfer stations, an infeed hopper, combustion chamber, ash collection, metals recovery, and emissions scrubbing systems that use activated carbon and selective catalytic reduction technologies to keep dioxin and other potential emissions below permit limits,
- The facility would burn municipal solid waste to produce steam, which turns an electrical turbine to create electricity. Washington State does not currently consider electricity from a mass burn facility as renewable,
- The ash produced as a by-product of the process would be screened to recover all remaining metal for recycling,
- After screening, ash would be transported to an out-of-county landfill where it would be buried separate from the municipal solid waste in an ash monofill. Various groups are researching beneficial use of incinerator ash; however, in Washington State the ash must be disposed in an ash monofill, and
- Non-processable and bypass waste would be transported to an out-of-county landfill.

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Waste-to-Energy in King County and the United States

In the late 1980s, both King County and the City of Seattle planned to convert from burying municipal solid waste in a landfill to sending waste to a mass burn facility. Protests by the public and environmental groups led both jurisdictions to abandon plans to build mass burn facilities and instead shift emphasis to recycling and waste reduction, along with exploring waste export to out-of-county landfills. However, during the past decade, technological advances in mass burn facilities and the emergence of other potentially viable waste conversion technologies have resulted in renewed interest in these options for long-term disposal once Cedar Hills has reached its permitted capacity.

The *King County Waste-to-Energy Study* (Normandeau 2017) identified a mass burn facility as the best waste-to-energy technology to consider for the county's solid waste system. There are 77 individual waste-to-energy facilities in 22 states listed in the *Energy Recovery Council 2016 Directory of Waste to Energy Facilities* (ERC 2016). Sixty of the facilities are mass burn, 13 are refuse-derived fuel, and four are modular. Mass burn is the most common waste-to-energy technology, representing 78 percent of the industry technology in the United States. Most facilities were built before 1996. The most recent plant was built in Florida in 2011 (operational in 2015) and is a 3,000 tons per day facility. In the United States, 3,000 tons per day is the upper capacity limit on the aging facilities from the 1990s. Small units with capacity of 1,000 tons per day or less have been built and some have been redesigned to expand capacity. A 5,000 ton per day facility, as proposed for King County, would be the largest mass burn facility in the United States.

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Appendix G

Agency Plan Review Letters

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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office • 1190 Fourth Avenue SE • Bellevue, Washington 98008-5452 • (425) 649-7000

May 7, 2018

Pat McLaughlin
King County Solid Waste Division Director
Department of Natural Resources and Parks
201 S. Jackson St, Suite 701,
Seattle WA 98104

Re: The Draft Comprehensive Solid Waste Management Plan, January 2018

Dear Pat McLaughlin:

Thank you for the opportunity to review and comment on this Plan.

We found it well-written and beautifully produced. We commend you, as well, on your early and widespread public involvement process, and the Division's responsiveness shown to the variety of comments and opinions expressed.

Besides our congratulations, Ecology's formal comments are transmitted with this letter.

We look forward to reviewing your Final Draft.

Sincerely,

Vicki Colgan

Vicki Colgan, CSBA LEED® AP
Regional Planning, Grants and Materials Management

Enclosure

cc: Peter Christiansen
Beth Humphreys

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KING COUNTY JANUARY 2018 PRELIMINARY DRAFT SOLID WASTE MANAGEMENT PLAN

Review Comments by: Vicki Colgan
Solid Waste Planner, NWRO
May 7, 2018

The goals of the solid waste planning process is to further reduce the total amount of waste materials produced by using effective waste reduction, recycling and outreach methods, properly disposing the waste remaining, and achieving compliance with state and local environmental regulations.

Ecology's review comments are offered to assist King County in polishing an already comprehensive, approvable, useful, and beautiful-produced solid waste management plan.

Comprehensive Plan development is not an easy assignment considering the multitude of responsibilities confronting King County. Ecology recognizes the extensive effort made in developing and updating this Draft Comprehensive Solid Waste Management Plan. In addition, the Plan presented to Ecology has undergone and is still undergoing a thorough review by the King County Solid Waste Advisory Committee (SWAC), the Metropolitan Solid Waste Management Advisory Committee (MSWMAC), King County cities, hauling service providers, Tribal representatives, the public, and other interested parties in the County.

This Plan, founded on well-conceived and executed previous Plans, furthers the strategies and tools King County will use as it continues to perform its job of solid waste handling and waste reduction within its jurisdiction.

To be as complete as possible, portions of this Plan were reviewed by staff who specialize in the fields of facilities, organics, solid waste handling and Cedar Hills landfill. Their comments are included in Ecology's comments below, which are organized as follows:

1. Procedural items that must be addressed prior to Ecology approval
2. Content items that must be addressed prior to Ecology approval
3. Highly recommended changes
4. Other comments

You will note that, rather than use 'division' in lower case as can often be seen in legislative language (and as done in your Plan), I've capitalized the word here, since it is used throughout as a name.

PROCEDURAL ITEMS THAT MUST BE ADDRESSED PRIOR TO PLAN APPROVAL

Resolutions of Adoption: King County, its cities, and other entities with interlocal agreements need to approve the updated Comprehensive Solid Waste Management Plan (CSWMP) prior to Ecology's approval of the final draft. Please include a statement assuring that the plan acceptance process outlined in the interlocal agreement has been fulfilled.

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Inclusion of letters: Please include within the Plan the letters from both the State Department of Agriculture and the Washington Utilities and Transportation Commission sent in response to their allowed 45-day review, along with these Ecology comments on the Preliminary Draft.

SEPA Completion: As of this writing, your programmatic State Environmental Policy Act (SEPA) Environmental Impact Statement produced for this Plan, is out of its review period and likely in its comment response phase. Please ensure this Impact Statement is final on or before the date the Final Draft CSWMP is submitted, and please ensure a copy of the notice informing interested parties that your Impact Statement is now final, is included in the Final Draft CSWMP.

SWAC Participation: Per Chapter 70.95.167(3) RCW, after the waste reduction and recycling element of the Plan is approved by the local legislative authority, but before it is submitted to Ecology for approval, the SWAC must hold another meeting to review the Final Draft of this element. Please verify SWAC participation with its notes/minutes containing discussion of this review.

CONTENT ITEMS THAT MUST BE ADDRESSED PRIOR TO ECOLOGY APPROVAL

Date Adjustment to Restoration of Closed Landfills (Page 6-24)
The five-year period stated on page 6-24 is from WAC 173-301-309. Because Chapter 173-301 WAC was repealed in 1985 when Chapter 173-304 WAC went into effect, the five-year period is not applicable and should not be cited. For those landfills that closed before 1985 (the effective date of Chapter 173-304 WAC), the applicable regulations are those of the Code of the King County Board of Health, Title 10.

Update LSWFA Information (Page 4-18)
Since this Draft Plan was presented for review before the Legislature passed the Capital Budget in mid-January, 2018, the Local Solid Waste Financial Assistance (LSWFA) program is now funded and well-underway. Sadly, the amount of funding available was reduced once again for implementation projects but enforcement programs were funded at levels comparable to the last funding cycle. The Washington Department of Ecology administers LSWFA in King County on behalf of many of the suburban cities, as well as for the Division and King County Public Health.

Important Additions (Pages x – xii, 2-19)

- Please add the word 'legal' after the word 'Any' in the diversion definition to rule out illegal dumping as an option.
- Please add a registered mark to the **Leadership in Energy and Environmental Design® (LEED)** definition, the preceding LEED® acronym, and to its first mention in the text on page 2-19.

HIGHLY RECOMMENDED CHANGES

Plan Year 1 (Page A-1): Please consider changing your Year 1 of this Plan to 2018, or better 2019, as Plan implementation begins once the Plan has been approved.

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More Additions (Pages xi-xii): Defining 'advanced material recovery' and 'material recovery facility' would also facilitate lay readers' understanding of common term used in our industry.

Composting and Food Recovery Facilities: Somewhere in Chapter 2 it would be good to build in a map or perhaps add to Figure 2-4 the current composting and food-rescue facilities.

Factoria's Features (Page 2-20): Here is a great (promotional) opportunity to insert more information on the green features at Factoria.

Table 4-3 Positioning (Page 4-19): Please consider moving this table up one paragraph up to immediately follow the reference to Table 4-3 in the text (placing it at the end of the second paragraph in "2015 and 2017 Market Assessments") to increase section cohesion.

Blue Sky Discussion (Page 4-20): As it was so aptly put on page 4-20 of the Draft CSWMP "given expected changes in China's import policies" it would be useful to add a brief description on the impacts felt by the division and how it has been reacting to China Sword→ National Sword→ Blue Sky developments.

Rail Capacity (Page 6-10): It is apparent that the Waste Export scenario will require far greater rail capacity than will the Waste-to-Energy option. Can this difference be estimated, perhaps in percentage terms? To which option is the second statement of this paragraph referring?

Figure Titles (Pages 6-11 to 6-16): Consider adding either the word 'Analysis' or the word 'Estimate' as appropriate to the titles of the Figures appearing on these pages to reinforce the idea these are not cast-in-stone projections, but an "analysis [that] focuses on several key factors" as stated in your introduction to this section. Also, please refer the reader to any new table or list (see Additional Appendix suggestion below) that may expand on the contents of these figures.

Figure 6-8: Without careful reading, Figure 6-8 appears to show a considerable amount from recycling residuals to a lay person having just looked at the Waste-to-Energy part of the graphs preceding it. Please redraw this graph to include the other 50-plus percent of recyclable materials, unless there was a certain point you were trying to make by showing a modest gain with a rather inflated graph. If so, please describe the purpose for the graph (as is) in the text.

Price of Success (Page 7-10): How would reaching the 70% diversion goal at Cedar Hills, given the necessary increase in organics, composting, and food recycling, affect output of the Landfill-Gas-to-Energy plant?

Additional Appendix: A table listing each of the cost categories used to generate Figures 6-3 and 6-6 especially would make an excellent appendix, and verify the comparing-apples-to-apples approach the Division is attempting here.

OTHER COMMENTS

Those that suggest change:

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Uniform Color Use: Please consider keeping the colors used in all the figures in Chapter 3: Forecasting and Data, consistently representing the same indicator (recycling is denoted by blue in Figure 3-3 and by green in Figure 3-4, as an example), to avoid confusion.

Defining Terms:

- (Page x) After each plastic listed in the acronyms, it may be beneficial to add a small recycling symbol containing the corresponding polymer number – thus taking advantage of a rather unexpected teaching opportunity!
- Including 'EPS' to the acronym list is also suggested.
- (Page xiii) Please consider adding to **waste prevention** an example, such as choosing to purchase items with less or no packaging.
- It would be good to verify that the Utilities and Transportation Commission is still using W in its acronym – I heard or read somewhere that they do not anymore.
- In the "Permitted Capacity Planned for Cedar Hills through 2028" text box, *compaction* and *compacts* seem to be the correct terms rather than *consolidation* and *consolidates (see use on page 2-6)*, or does the Division see these as synonyms?
- (Page 6-6) It might be helpful to present your definition of being 'a good neighbor', since that definition seems to vary greatly among people....

Bulleted Response Levels (Page 6-24): Separating each definition of the three levels by bullets here would make the definitions easier to read and locate in the document, as well as would add emphasis to this important concept on what to expect in an emergency.

References: The websites given for many of the references are great tools for those of us that like to do further research. Is it possible to add to the citations without websites where the material can be obtained or at least add an introductory paragraph on general guidance for contacting the sources at the beginning of Chapter 8?

Labeled Appendices: It may be helpful for the reader if each Appendix were labeled as to its contents, much like the Chapters of the Plan are, especially in the Table of Contents

OTHER COMMENTS

Comments that applaud work ongoing or already complete:

- Selection and placement of the photographs in the Plan made for easy reading as did the prose, thankfully absent the 'normal' repetitive references old-school technical writers employ.
- The blue text boxes used throughout that explain uncommon terms or specialized concepts are very welcomed and further add to the clarity and readability of this Plan.
- Noted and applauded are the apt, well-worded definitions of **equity** and **sustainability** in the opening pages of the Plan.

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- Figure 2-5: Current Layout of Cedar Hills Landfill illustrates the principle that "a picture is worth a thousand words," said map being quite easy to interpret, as well as nicely colored!

- Examples given on ways to improve traffic management at transfer stations given on page 2-14 are inspired! It's likely safe to assume that the online site would be compatible with cell phone viewing and the reader boards will be placed in optimal viewing locations. I look forward to their implementation!

- Another inspirational idea is the Repair Groups cited on page 4-11 –a great waste reduction/ sustainable materials management strategy, with the added benefit of community-building that can help ease equity issues.

- Especially regarding Chapters 2, 4 and 6, Ecology appreciate the broad view King County continues to take in balancing traditional materials management with sustainable materials management practices and anticipated developments in new waste handling technologies. Success not only requires careful planning and strategic public involvement, but also intuition and finesse to achieve. Well done!

- Transfer Station Upgrades/ New Construction: Ecology's Northwest Regional Office sits just uphill from the new Factoria Transfer Station, and we have visited – and used as private King County citizens – the new facilities at Enumclaw, Shoreline and Bow Lake. We found these facilities easy to access, thoughtfully laid out, staffed with skilled people, and efficient in operation. We commend as well as appreciate the Division's careful design and construction of these transfer stations, which incorporated many elements of sustainable building that will add to their longevity, lower the cost of their upkeep, and provide staff with superior working conditions. And again, well done!

Respectfully submitted,

Vicki Colgan

Vicki Colgan, CSBA, LEED AP
Regional Planning, Grants and Materials Management
WA Dept. of Ecology, NW W2R Program
3190 160th Ave. SE
Bellevue WA 98008-5452
425/649-7224
vcol461@ecy.wa.gov

DEPARTMENT OF ECOLOGY State of Washington

Ecology Comments to Kitsap County Solid and Hazardous Waste Management Plan – Page 4

ORIGINAL

Service Date: February 8, 2018

STATE OF WASHINGTON
UTILITIES AND TRANSPORTATION COMMISSION
1300 S. Evergreen Park Dr. S.W., P.O. Box 47250 • Olympia, Washington 98504-7250
(360) 664-1160 • TTY (360) 586-8203

February 8, 2018

Meg Morehead
King County Solid Waste Division, DNRP
King Street Center
201 S. Jackson Street
Seattle, WA 98104-3855

RE: King County Draft Comprehensive Solid Waste Management Plan Cost Assessment Questionnaire, TG-180044

Dear Ms. Morehead:

The Washington Utilities and Transportation Commission (Commission) has completed its review of the cost assessment questionnaire for the draft of the King County Comprehensive Solid Waste Management Plan (Plan), submitted Janurary 9, 2018.

The cost assessment questionnaire in the Plan proposes three tip fee increases at all King County transfer stations during the 2017 – 2022 Plan period. The tip fee increase in 2017 has already been in effect for over a year, while the other two tip fee increases are projected to take effect in 2019 and 2022. As a result, there will be a rate impact to ratepayers served by regulated solid waste collection companies in King County in years 2019 and 2022. This is illustrated in the table shown on the following page.

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Letter to Meg Morehead
TG-180044
Page 2

	*2017**	*2018*	*2019*	*2020*	*2021*	*2022*	*Total*
All King County Transfer Stations – Projected Disposal Fees							
Per Ton Disposal Cost	$134.59	$134.59	$141.66	$141.66	$141.66	$147.33	
Per Ton Increase	$14.42	$0.00	$7.07	$0.00	$0.00	$5.67	$27.16
Projected Rate Increases							
Residential							
Monthly rate increase for one 32-gallon can per week service	$1.06	$0.00	$0.52	$0.00	$0.00	$0.42	$2.00
Commercial							
Monthly rate increase for one-yard per pick up service	$5.47	$0.00	$2.68	$0.00	$0.00	$2.15	$10.30

**The 2017 tip fee has been in place since January 1, 2017, therefore customers have already experienced the rate effect of this tip fee increase.*

Staff has no further comment on the cost assessment questionnaire. Please direct questions or comments to Greg Hammond at (360) 664-1278, or by email at greg.hammond@utc.wa.gov.

Sincerely,

Steven V. King
Executive Director and Secretary

cc: Vicki Colgan, Department of Ecology, Regional Planner

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Service Date: June 14, 2018

STATE OF WASHINGTON
UTILITIES AND TRANSPORTATION COMMISSION
1300 S. Evergreen Park Dr. S.W., P.O. Box 47250 • Olympia, Washington 98504-7250
(360) 664-1160 • TTY (360) 586-8203

June 14, 2018

Meg Morehead
King County Solid Waste Division, DNRP
King Street Center
201 S. Jackson Street
Seattle, WA 98104-3855

RE: Revised King County Draft Comprehensive Solid Waste Management Plan Cost Assessment Questionnaire, TG-180451

Dear Ms. Morehead:

The Washington Utilities and Transportation Commission (Commission) has completed its review of the revised cost assessment questionnaire for the draft of the King County Comprehensive Solid Waste Management Plan (Plan), submitted May 18, 2018. Staff reviewed this plan and the prior cost assessment questionnaire under the previous Docket, TG-180044. The cost assessment questionnaire portion was updated at the request of Department of Ecology due to the fact that the plan period began in 2017, which was one full year out of date when filed with the Commission.

There was a relatively large change to the overall recycling rate in this revised cost assessment. From 2017 to 2018, the recycling rate dropped 5.4 percent, to an overall recycling rate of 52 percent. This is due to a 14 percent increase in garbage tonnage disposed, and an 8 percent reduction in recycling tons processed. The County proposes two tip fee increases at all King County transfer stations during the 2018 – 2023 Plan period. These tip fee increases are expected to occur in 2020 and 2023. As a result, there will be a rate impact to ratepayers served by regulated solid waste collection companies in King County in years 2020 and 2023. This is illustrated in the table shown on the following page.

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Letter to Meg Morehead
TG-180451
Page 2

	2018	*2019*	*2020*	*2021*	*2022*	*2023*	*Total*
All King County Transfer Stations – Projected Disposal Fees							
Per Ton Disposal Cost	$134.59	$134.59	$140.82	$140.82	$140.82	$154.16	
Per Ton Increase	$0.00	$0.00	$6.23	$0.00	$0.00	$13.34	$19.57
Projected Rate Increases							
Residential							
Monthly rate increase for one 32-gallon can per week service	$0.00	$0.00	$0.46	$0.00	$0.00	$0.98	$1.44
Commercial							
Monthly rate increase for one-yard per pick up service	$0.00	$0.00	$2.36	$0.00	$0.00	$5.06	$7.42

Staff has no further comment on the cost assessment questionnaire. Please direct questions or comments to Greg Hammond at (360) 664-1278 or by email at greg.hammond@utc.wa.gov.

Sincerely,

Mark L. Johnson
Executive Director and Secretary

cc: Vicki Colgan, Department of Ecology, Regional Planner

ORIGINAL

STATE OF WASHINGTON

DEPARTMENT OF AGRICULTURE

Division of Plant Protection

P.O. Box 42560 • Olympia, Washington 98504-2560 • (360) 902-1800

March 7, 2018

Ms. Meg Moorehead
Strategy, Communications, and Performance Manager
King County Solid Waste Division
Department of Natural Resources and Parks
King Street Center
201 S. Jackson Street
Seattle, WA 98104-3855

Dear: Ms. Moorehead,

The Washington State Department of Agriculture (WSDA) reviewed King County's Draft Solid Waste Management Plan (SWMP). Our staff has determined that the draft SWMP is in compliance with state plant pest and disease quarantines as described in Chapter 16-470 WAC. We reviewed the waste management plan with particular emphasis to the state's apple maggot quarantine, described in Chapter 16-470-101 WAC. The transport of municipal green waste and municipal solid waste from the apple maggot quarantine area to the pest free area is prohibited without a WSDA special permit. WSDA will not require King County to have a special permit to ship municipal solid waste or green waste. However, if the conditions contained in the SWMP change and you have questions about whether King County is in compliance with the apple maggot quarantine rule please do not hesitate to contact me or WSDA Pest Program staff.

Thank you for providing our agency with the opportunity to comment on the King County Solid Waste Management Plan. RCW 70.95.096 requires the Washington State Department of Agriculture to review solid waste permit applications for any increased risks of introducing a quarantine plant pest or disease into a pest free area.

Regards,

Jim Marra, Ph.D.

cc: Leah Doyle

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Appendix H

Title 10 Plan Content Code Requirements

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The following describes how the Plan meets these Title 10.24.30 Plan content requirements:

F. A current inventory and description of solid waste collection needs and operations within each respective jurisdiction, which shall include:

1. Any franchise for solid waste collection granted by the utilities and transportation commission in the respective jurisdictions including the franchise holder's name, the business address for the franchise, the area covered by the franchise and the rates charged in comparison to disposal costs;

Most of the required information can be found in Appendix A – Utilities and Transportation Commission Cost Assessment:

- Specific information regarding UTC-regulated haulers including G-certificate permit numbers, addresses, customers served and tons collected as well as six-year projections for both can be found on pages A-4 through A-5.
- A map, Solid Waste Collection Company Service Areas, is included on page H-6
- More general information regarding non-regulated hauler areas (cities with contracts), including number of customers and tons collected as well as six-year projections for both can be found on pages A-6 through A-7.
- Appendix A, pages A-2 throughA-14 provides details on the system component costs and funding mechanisms. Pages A-13 and A-14 includes information on division revenues and expenditures, including disposal costs.
- Attachment A includes a tariff page from each hauler serving unincorporated King County and UTC-regulated cities for the residential curbside rate, the disposal rates, and a link to the entire UTC franchise tariff.
- Table 4-4 on pages 4-22 and 4-23 in Chapter 4 identifies which hauler is serving which city and unincorporated area along with other contract and collection information.

2. Any city solid waste operational plan, including boundaries and identification of responsibilities;

By signing the Amended and Restated Interlocal Agreement, all of the 37 cities in the King County solid waste system have agreed that the King County Solid Waste Division is the planning authority for the system, therefore the cities don't have their own solid waste plans.

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3. The population density of each area serviced by a city operation or by a franchised operation within the respective jurisdictions;

- Appendix A, page A-1, includes the population projections for the entire King County system.
- The area served by the regional system, including cities and the unincorporated areas, is shown in Figure 2-1, page 2-2.
- Chapter 3 discusses the current and projected population of areas served by the transfer stations (which encompasses all of the cities and urban areas).
- The City of Enumclaw provides solid waste collection to a population of 11,490. The City of Skykomish services a population on 200.
- Population of areas served by UTC-regulated haulers include:

Area	Population
Beaux Arts	300
Black Diamond	4,335
Hunts Point	415
Kenmore	22,580
Medina	3,205
Woodinville	11,660
Yarrow Point	1,040
Unincorporated King County	245,920

4. The projected solid waste collection needs for the respective jurisdictions for the next six years;

- Chapter 3 includes details of solid waste generation projections for the future.
- Chapter 4 discusses current and future collection issues (pages 4-21 to 4-35).
- Table 4-4, on page 4-22 and 4-23, includes information on haulers, contracts, and collection needs/service types in each jurisdiction.

5. Analysis of operating economics, travel distances and economically optimal locations of solid waste facilities;

Route efficiency is essential to operating economics, travel distances, and economically optimal locations of solid waste facilities as described below:

- Chapter 5 discusses planning for the Transfer System. Figure 5-1, page 5-2, shows where each of the transfer facilities and Cedar Hills Landfill is located. The map shows that the facilities are well-distributed to maximize the efficiency of the system.
- Table 5-1 lists each station and how many tons and transactions each received in 2017.

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- The Plan discusses the need to site and build a new transfer station in the Northeast part of the county, but does not identify a site.
- The Plan discusses the Level of Service criteria (including travel distance, which is an indicator of route efficiency) and siting criteria (developed as part of the Solid Waste Transfer and Waste Management Plan) that will be used in the siting process. These criteria take operating economics and location into account.
- A map, Census Tract Travel Time to Nearest Solid Waste Transfer Station, included on page H-7, shows that the travel times to the nearest station meet the Level of Service criteria. This criterion indicates how conveniently located the facilities are for customers (including commercial haulers concerned with maximizing route efficiency), measured by the maximum travel time to the closest facility in their service area. The standard was established as 30 minutes for at least 90 percent of the customers. It provides an indication of whether the transfer stations are well dispersed throughout the county.

G. A review of potential areas that meet the siting criteria as outlined in RCW 70.95.165.

The siting process for the NERTS has not progressed to a point where any potential sites have been identified. A budget request to start a preliminary siting process was submitted for Council consideration, but has not yet been approved.

- The Plan discusses the siting process (pages 5-18 through 5-20) that was used for the South County Recycling and Transfer Station and will be adapted for NERTS.
- Action 1-t also states that the siting criteria identified in the Solid Waste Transfer and Waste Management Plan, Appendix C, will be adapted to meet the community needs in siting a new NERTS. Appendix C identifies the same elements to review that are included in RCW 70.95.1.

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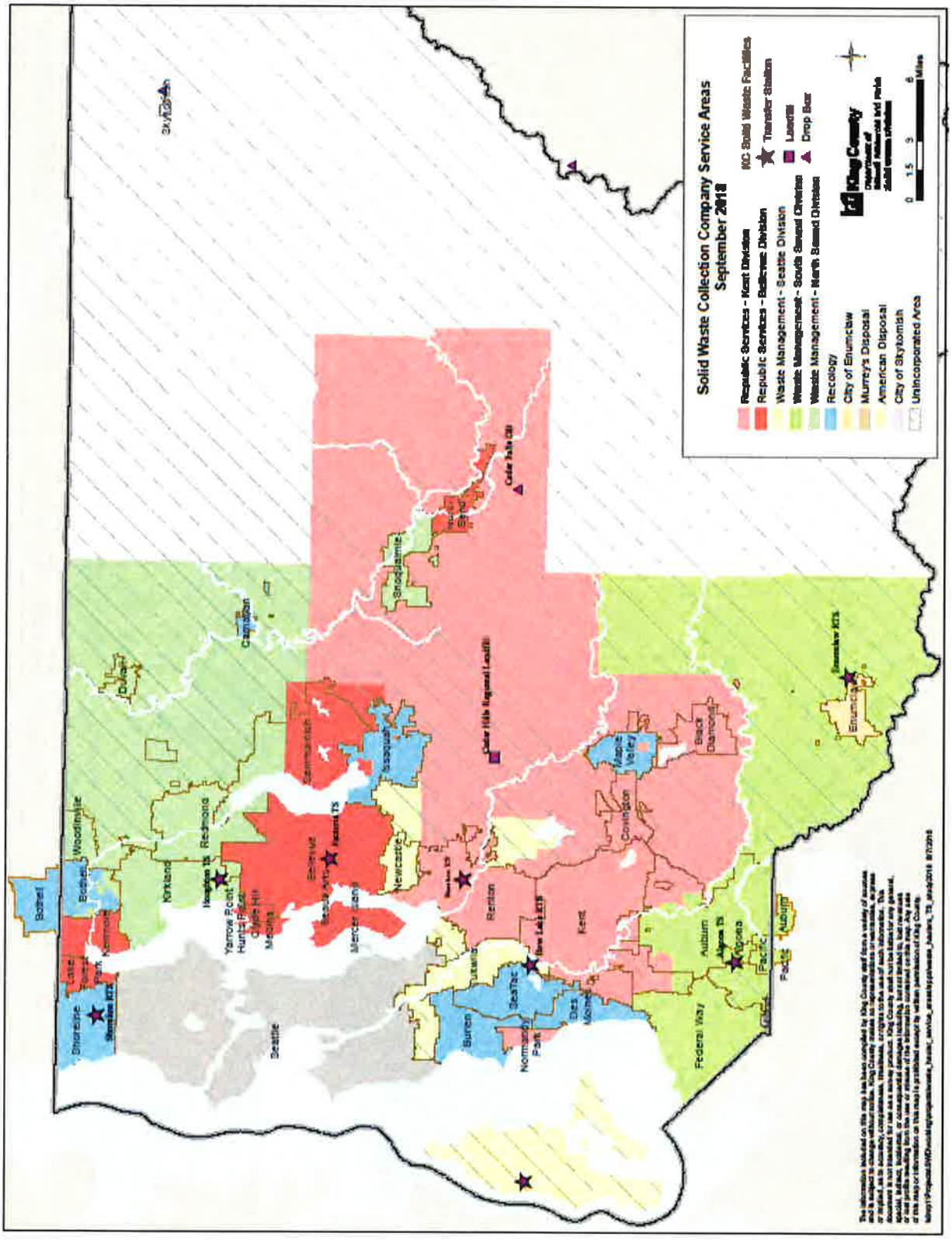
Solid Waste Collection Company Service Areas
September 2018
Republic Services - Kent Division
Republic Services - Bellevue Division
Waste Management - Seattle Division
Waste Management - South Sound Division
Waste Management - North Sound Division
Recology
City of Enumclaw
Murrey's Disposal
American Disposal
City of Skykomish
Unincorporated Area
KC Solid Waste Facilities
Transfer Station
Landfill
Drop Box
King County
Miles
Bothell
Woodinville
Kirkland
Redmond
Carnation
Snoqualmie
Sammamish
Issaquah
Newcastle
Renton
Kent
Covington
Maple Valley
Black Diamond
Enumclaw
Auburn
Pacific
Federal Way
Des Moines
Burien
Seattle
Shoreline
Lake Forest Park
Kenmore
Yarrow Point
Hunts Point
Clyde Hill
Medina
Mercer Island
Bellevue
Tukwila
Normandy Park
Cedar Falls Regional Landfill

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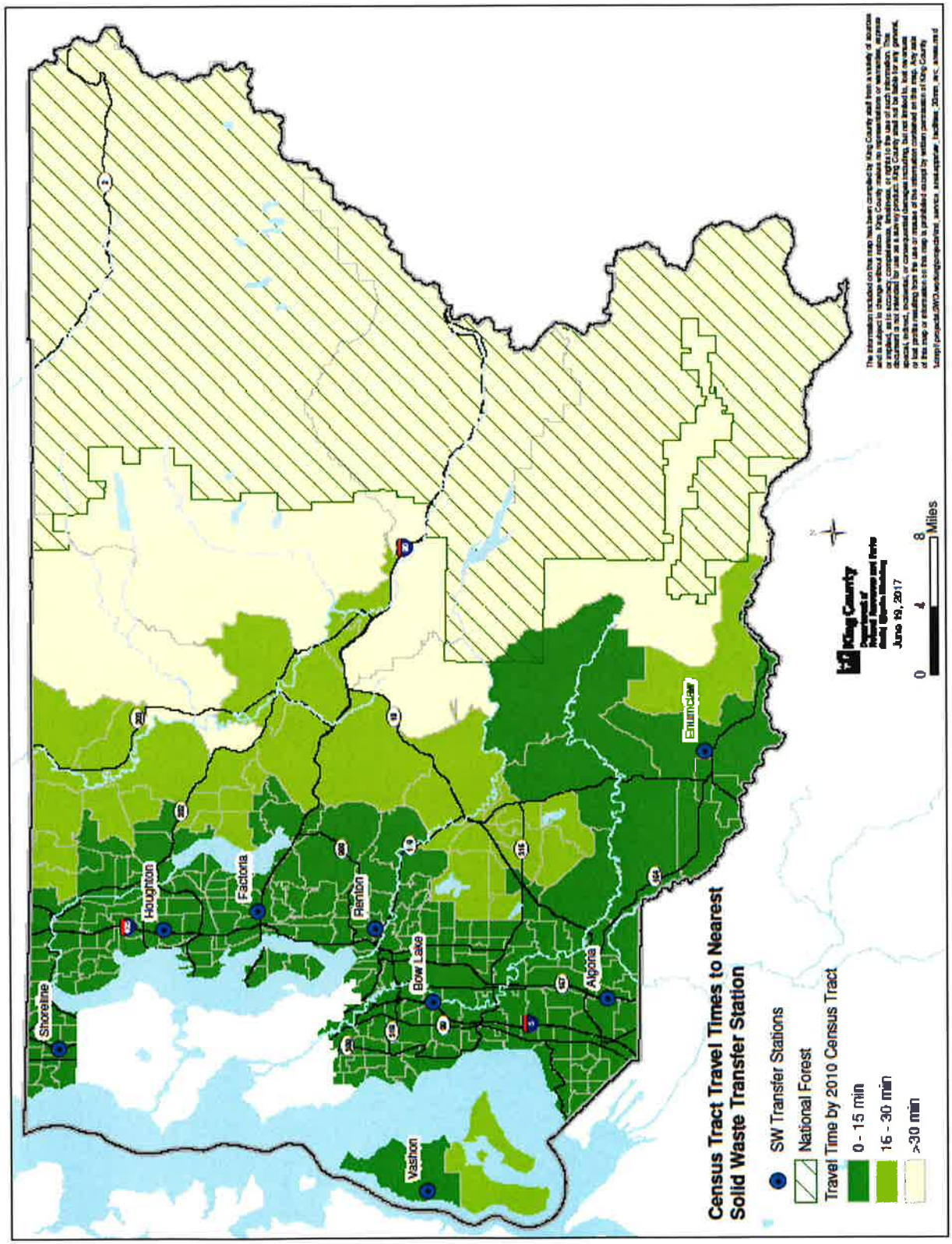
Census Tract Travel Times to Nearest
Solid Waste Transfer Station
SW Transfer Stations
National Forest
Travel Time by 2010 Census Tract
0 - 15 min
16 - 30 min
>30 min
Shoreline
Houghton
Factoria
Renton
Bow Lake
Algona
Enumclaw
Vashon
0
4
8
Miles
June 19, 2017

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ATTACHMENT A

American Disposal Company, Inc. G-Permit G-87

Serves Vashon Island

https://www.utc.wa.gov/regulatedIndustries/transportation/TransportationDocuments/American%20Disposal%20Company%20Inc%20Vashon%20Disposal%20G-87%20Tariff%20No%201.pdf

RECEIVED NOV 03, 2016 WA. UT. & TRANS. COMM. ORIGINAL TG-161184 SUB 11/29/16

Tariff No. 1 — 3 Revised Page No. 21

Company Name/Permit Number: American Disposal Co Inc G-87
Registered Trade Name(s): Vashon Disposal

Item 100 – Residential Service – Monthly Rates (continued on next page)

Rates in this item apply:

(1) To solid waste collection, curbside recycling (where noted) and yardwaste services (where noted) for residential property. This includes single family dwellings, duplexes, apartments, mobile homes, condominiums, etc., where service is billed directly to the occupant of each residential unit, and/or
(2) When required by a local government service level ordinance, solid waste collection, curbside recycling, and yardwaste service must be provided for single-family dwellings, duplexes, mobile homes, condominiums, and apartment buildings of less than _____ residential units, where service is billed to the property owner or manager.

Rates below apply in the following service area:

Number of Units or Type of Containers	Frequency of Service	Garbage Service Rate		Recycle Service Rate		Yardwaste Service Rate	Number of Units or Type of Containers	Frequency of Service	Garbage Service Rate	Recycle Service Rate	Yardwaste Service Rate
1	MG	$ 5.63	(A)								
1	EOWG	$ 13.96	(A)								
Mini-can	WG	$ 12.49	(A)								
1	WG	$ 17.64	(A)								
2	WG	$ 24.65	(A)								
3	WG	$ 33.23	(A)								
4	WG	$ 41.59	(A)								
	EOWR, with garbage			$ 9.74							
	EOWR, without garbage			$ 11.24							

Frequency of Service Codes: WG=Weekly Garbage; EOWG=Every Other Week Garbage; MG=Monthly Garbage; WR=Weekly Recycling
EOWR=Every Other Week Recycling; MR=Monthly Recycling; List others used by company

Note 1: Description/rules related to recycling program are shown on page 23.
Note 2: Description/rules related to yardwaste program are shown on page _____.
Note 3: In addition to the recycling rates shown above, a recycling debit/credit of $_____ applies.

***

***

Recycling service rates on this page expire on: _____

Issued By: Heather Garland

Issue Date: November 14, 2016 — Effective Date: January 1, 2017

(For Official Use Only)

Docket No. TG-_____ Date: _____ By: _____

FOR OFFICIAL USE ONLY
Docket: TG-161184
Agenda Date: December 8, 2016
Effective Date: January 1, 2017

ORIGINAL

RECEIVED NOV 03, 2016 WA. UT. & TRANS. COMM. ORIGINAL TG-161184

Tariff No. 1 4 Revised Page No. 34

Company Name/Permit Number: American Disposal Co Inc G-87
Registered Trade Name(s) Vashon Disposal

Item 230 -- Disposal Fees

Charges in this item apply when other items in the tariff specifically refer to this item.

Disposal site (name or location)	Type of Material	Fee for Disposal
King County Landfill		$134.59 (A) per ton
		$ per
		$ per
		$ per
		$ per
		$ per
		$ per
		$ per
		$ per
		$ per
		$ per
		$ per
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		$ per
		$ per
		$ per
		$ per
		$ per

State whether fees are per yard, per ton, etc. Include charges assessed for special commodities (tires, appliances, asbestos, etc.) or special conditions at each specific disposal site. Attach additional sheets as necessary.

Issued By: Heather Garland

Issue Date: November 14, 2016 Effective Date: January 1, 2017

(For Official Use Only)

Docket No. TG-_____ Date: _____ By: _____

FOR OFFICIAL USE ONLY
Docket: TG-161184
Agenda Date: December 8, 2016
Effective Date: January 1, 2017

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Rabanco LTD Permit G-12
https://www.utc.wa.gov/regulatedIndustries/transportation/TransportationDocuments/Rabanco%20LTD%20dba%20Eastside%2c%20Container%20Hauling%20G-12%20Tariff%2011.pdf
Serves Unincorporated King County, Beaux Arts, Hunts Point, Kenmore, Medina, and Yarrow Point

RECEIVED MAY 31, 2018 WA. UT. & TRANS. COMM. ORIGINAL TG-180484 SUB 07/12/18

Tariff No. 11 28th Revised Page No. 21

Company Name/Permit Number: Rabanco LTD G-12
Registered Trade Name(s) Eastside Disposal, Rabanco Companies, Rabanco Connections

Item 100 -- Residential Service -- Monthly Rates (continued on next page)

Rates in this item apply:

(1) To solid waste collection, curbside recycling (where noted) and yardwaste services (where noted) for residential property. This includes single family dwellings, duplexes, apartments, mobile homes, condominiums, etc., where service is billed directly to the occupant of each residential unit, and/or
(2) When required by a local government service level ordinance, solid waste collection, curbside recycling, and yardwaste service must be provided for single-family dwellings, duplexes, mobile homes, condominiums, and apartment buildings of less than 4 residential units, where service is billed to the property owner or manager.

Rates below apply in the following service area: **Appendix A**

Number of Units or Type of Containers	Frequency of Service	Garbage Service Rate	Recycle Service Rate	Yardwaste / Organics Service Rate			Optional Container Rental		
20 gallon can	WG/EOWR	$8.05	$9.23	$9.23			$0.42		
1 Can	WG/EOWR	$12.93	$9.23	$9.23			$0.53		
2 Can	WG/EOWR	$22.00	$9.23	$9.23			$1.06		
3 Can	WG/EOWR	$32.18	$9.23	$9.23			$1.59		
4 Can	WG/EOWR	$43.23	$9.23	$9.23			$2.12		
5 Can	WG/EOWR	$54.56	$9.23	$9.23			$2.65		
32 Gal Toter	WG/EOWR	$12.93	$9.23	$9.23			$1.09		
64 Gal Toter	WG/EOWR	$21.92	$9.23	$9.23			$1.86		
96 Gal Toter	WG/EOWR	$32.01	$9.23	$9.23			$1.86		
1 Can	MG/EOWR	$4.66	$9.23	$9.23			$0.53		
Recycle Only			$10.23						
Yardwaste Only				$10.23			$1.86		
20 Gal Toter (N)	EOW Organics *(limited availability)*			$8.82			$1.09	*see page 26b*	
32 Gal Bear Proof Toter		$12.93					$3.94	*see note 8*	
64 Gal Bear Proof Toter		$22.00					$8.17	*see note 8*	
96 Gal Bear Proof Toter		$32.18					$8.43	*see note 8*	

Frequency of Service Codes: WG=Weekly Garbage; EOWG-Every Other Week Garbage; MG=Monthly Garbage; WR=Weekly Recycling
EOWR=Every Other Week Recycling; MR=Monthly Recycling; List others used by company:

Note 1: Description/rules related to recycling program are shown on page 25.
Note 2: Description/rules related to yardwaste program are shown on page 26.
Note 3: In addition to the recycling rates shown above, a recycling debit/(credit) of ($0.16) (A) applies.
Note 4: Recycling rates shown above are subject to an additional recycling processing surcharge of **$0.55** per month.
The recycling processing surcharge on this page will expire: **December 31, 2018**

Recycling rates on this page expire on: January 31, 2019

Issued By: Rick Waldren, Business Unit Controller

Issue Date: June 15, 2018 Effective Date: August 1, 2018

(For Official Use Only)

Docket No. TG-_____ Date: _____ By: _____ FOR OFFICIAL USE ONLY

ORIGINAL

RECEIVED MAY 31, 2018 WA. UT. & TRANS. COMM. ORIGINAL TG-180484
SUB 07/12/18

Tariff No. 11 29th Revised Page No. 23

Company Name/Permit Number: Rabanco LTD G-12
Registered Trade Name(s) Eastside Disposal, Rabanco Companies, Rabanco Connections

Item 100 -- Residential Service -- Monthly Rates (continued on next page)

Rates in this item apply:

(1) To solid waste collection, curbside recycling (where noted) and yardwaste services (where noted) for residential property. This includes single family dwellings, duplexes, apartments, mobile homes, condominiums, etc., where service is billed directly to the occupant of each residential unit, and/or
(2) When required by a local government service level ordinance, solid waste collection, curbside recycling, and yardwaste service must be provided for single-family dwellings, duplexes, mobile homes, condominiums, and apartment buildings of less than 4 residential units, where service is billed to the property owner or manager.

Rates below apply in the following service area: **Appendix B**

Number of Units or Type of Containers	Frequency of Service	Garbage Service Rate	Recycle Service Rate	Yardwaste / Organics Service Rate			Optional Container Rental		
20 gallon can	WG/WR	$8.05	$11.47	$12.75			$0.42		
1 Can	WG/WR	$12.93	$11.47	$12.75			$0.53		
2 Can	WG/WR	$22.00	$11.47	$12.75			$1.06		
3 Can	WG/WR	$32.18	$11.47	$12.75			$1.59		
4 Can	WG/WR	$43.23	$11.47	$12.75			$2.12		
5 Can	WG/WR	$54.56	$11.47	$12.75			$2.65		
32 Gal Toter	WG/WR	$12.93	$11.47	$12.75			$1.09		
64 Gal Toter	WG/WR	$21.92	$11.47	$12.75			$1.86		
96 Gal Toter	WG/WR	$32.01	$11.47	$12.75			$1.86		
1 Can	MG/WR	$4.66	$11.47	$12.75			$0.53		
Recycle Only			$12.47						
Yardwaste Only				$13.75			$1.86		
32 Gal Bear Proof Toter		$12.93					$3.94	*see note 8*	
64 Gal Bear Proof Toter		$22.00					$8.17	*see note 8*	
96 Gal Bear Proof Toter		$32.18					$8.43	*see note 8*	

Frequency of Service Codes: WG=Weekly Garbage; EOWG-Every Other Week Garbage; MG=Monthly Garbage; WR=Weekly Recycling
EOWR=Every Other Week Recycling; MR=Monthly Recycling; List others used by company.

Note 1: Description/rules related to recycling program are shown on page 25.
Note 2: Description/rules related to yardwaste program are shown on page 26.
Note 3: In addition to the recycling rates shown above, a recycling debit/(credit) of ($0.16) (A) applies.
Note 4: Recycling rates shown above are subject to an additional recycling processing surcharge of **$0.55** per month.
The recycling processing surcharge on this page will expire: **December 31, 2018**

Recycling rates on this page expire on: January 31, 2019

Issued By: Rick Waldren, Business Unit Controller

Issue Date: June 15, 2018 Effective Date: August 1, 2018

(For Official Use Only)

Docket No. TG-_____ Date: _____ By: _____

FOR OFFICIAL USE ONLY
Docket: TG-180484
Granting Tariff Revisions per Order 01 in Docket TG-180484
Agenda Date: July 26, 2018
Effective Date: August 1, 2018

ORIGINAL

RECEIVED NOV 15, 2016 WA. UT. & TRANS. COMM. ORIGINAL TG-161214
SUB 01/23/17

Tariff No. 11 5th Revised Page No. 39

Company Name/Permit Number: Rabanco LTD G-12
Registered Trade Name(s) Eastside Disposal, Container Hauling, Rabanco Companies, Rabanco Connections

Item 230 -- Disposal Fees

Charges in this item apply when other items in the tariff specifically refer to this item.

Disposal site (name or location)	Type of Material	Fee for Disposal
King County transfer stations and landfills	garbage	$134.59 per ton
King County transfer stations and landfills	special waste	$145.00 per ton
King County transfer stations and landfills	yardwaste	$75.00 per ton
Rabanco Transfer Station	garbage	$134.59 per ton
Rabanco Transfer Station	CDL	$85.75 per ton
Rabanco Transfer Station	yardwaste	$53.50 per ton
Black River Transfer Station	CDL	$85.75 per ton
Land Recovery Inc.	Minimum Charge	$7.00 per load
Land Recovery Inc.	Demolition & Debris	$8.00 per yard
Land Recovery Inc.	Concrete & Stumps	$12.50 per yard
Seattle Transfer Stations	garbage	$79.35 per ton
Cedar Grove Composting, Inc.	yardwaste	$37.50 per ton

State whether fees are per yard, per ton, etc. Include charges assessed for special commodities (tires, appliances, asbestos, etc.) or special conditions at each specific disposal site. Attach additional sheets as necessary.

Issued By: Rick Waldren, Business Unit Controller

Issue Date: November 15, 2016 Effective Date: January 1, 2017

(For Official Use Only)

Docket No. TG-_____ Date: _____ By: _____

FOR OFFICIAL USE ONLY
Docket: TG-161214
Agenda Date: January 26, 2017
Effective Date: January 1, 2017

ORIGINAL

Fiorito Enterprises, Inc. and Rabanco Companies G-Permit G-60
https://www.utc.wa.gov/regulatedIndustries/transportation/TransportationDocuments/Fiorito%20Ent.%20Rabanco%20Co%20dba%20Kent-Meridian%20Disp%20G-60%20Tariff%20No%2027.pdf
Serves unincorporated King County

RECEIVED MAY 31, 2018 WA. UT. & TRANS. COMM. ORIGINAL TG-180485 SUB 07/12/18

Tariff No. 27 35th Revised Page No. 21

Company Name/Permit Number: Fiorito Enterprises Inc. & Rabanco Companies - G-60
Registered Trade Name(s) Kent-Meridian Disposal Company, Allied Waste Services of Kent, & Republic Services of Kent

Item 100 – Residential Service -- Monthly Rates (continued on next page)

Rates in this item apply:

(1) To solid waste collection, curbside recycling (where noted) and yardwaste services (where noted) for residential property. This includes single family dwellings, duplexes, apartments, mobile homes, condominiums, etc., where service is billed directly to the occupant of each residential unit, and/or
(2) When required by a local government service level ordinance, solid waste collection, curbside recycling, and yardwaste service must be provided for single-family dwellings, duplexes, mobile homes, condominiums, and apartment buildings of less than 4 residential units, where service is billed to the property owner or manager.

Rates below apply in the following service area: **Appendix A**

Number of Units or Type of Containers	Frequency of Service	Garbage Service Rate	Recycle Service Rate	Yardwaste / Organics Service Rate			Optional Container Rental		
20 gallon can	WG/EOWR	$9.79	$7.90	$9.22			$1.02		
1 Can	WG/EOWR	$16.05	$7.90	$9.22			$0.65		
2 Can	WG/EOWR	$25.90	$7.90	$9.22			$1.31		
3 Can	WG/EOWR	$37.19	$7.90	$9.22			$1.96		
4 Can	WG/EOWR	$49.56	$7.90	$9.22			$2.61		
5 Can	WG/EOWR	$58.45	$7.90	$9.22			$3.26		
32 Gal Toter	WG/EOWR	$14.77	$7.90	$9.22			$1.27		
64 Gal Toter	WG/EOWR	$23.26	$7.90	$9.22			$1.27		
96 Gal Toter	WG/EOWR	$31.82	$7.90	$9.22			$1.27		
1 Can	MG/EOWR	$6.78	$7.90	$9.22			$0.65		
Recycle Only			$9.04						
Yardwaste Only				$10.46			$1.87		

Frequency of Service Codes: WG=Weekly Garbage, EOWG=Every Other Week Garbage; MG=Monthly Garbage; WR=Weekly Recycling; EOWR=Every Other Week Recycling; MR=Monthly Recycling. List others used by company:

Note 1: Description/rules related to recycling program are shown on page23.
Note 2: Description/rules related to yardwaste program are shown on page 24.
Note 3: In addition to the recycling rates shown above, a recycling debit/(credit) of ($0.14)(A) applies.
Note 4: Recycling rates shown above are subject to an additional recycling processing surcharge of **$0.54 per month**.
The recycling processing surcharge on this page will expire: **December 31, 2018**

Recycling rates on this page expire on: January 31, 2019

Issued By: Rick Waldren, Business Unit Controller

Issue Date: June 15, 2018 Effective Date: August 1, 2018

(For Official Use Only)

Docket No. TG-_____ Date: _____ By: _____

FOR OFFICIAL USE ONLY
Docket: TG-180485
Granting Tariff Revisions per Order 01 in Docket TG-180485
Agenda Date: July 26, 2018
Effective Date: August 1, 2018

ORIGINAL

RECEIVED NOV 15, 2016 WA. UT. & TRANS. COMM. ORIGINAL TG-161217
SUB 12/14/16

Tariff No. 27 6th Revised Page No. 38

Company Name/Permit Number: Fiorito Enterprises, Inc. & Rabanco Companies - G 60
Registered Trade Name(s) Kent Meridian Disposal Company, Allied Waste Services of Kent, & Republic Services of Kent

Item 230 -- Disposal Fees

Charges in this item apply when other items in the tariff specifically refer to this item.

Disposal site (name or location)	Type of Material	Fee for Disposal
King County transfer stations and Landfills	garbage	$134.59 per ton (A)
King County transfer stations and Landfills	special waste	$162.00 per ton (A)
Rabanco Transfer Station	garbage	$134.59 per ton (A)
Rabanco Transfer Station	CDL	$92.23 per ton (A)
Black River Transfer Station	CDL	$80.60 per ton (A)
Cedar Grove Composting, Inc.	yardwaste	40.95 per ton (A)

State whether fees are per yard, per ton, etc. Include charges assessed for special commodities (tires, appliances, asbestos, etc.) or special conditions at each specific disposal site. Attach additional sheets as necessary.

Issued By: Rick Waldren, Division Controller

Issue Date: November 15, 2016 Effective Date: January 1, 2017

(For Official Use Only)

Docket No. TG-_____ Date: _____ By: _____

FOR OFFICIAL USE ONLY
Docket: TG-161217
Agenda Date: December 22, 2016
Effective Date: January 1, 2017

ORIGINAL

Rabanco LTD, G-12
https://www.utc.wa.gov/regulatedIndustries/transportation/TransportationDocuments/R%20LTD%20-%20Allied%20Waste%20of%20Kent%2c%20Rabanco%20Cos%2c%20SeaTac%20Disp%20G-12%20Tariff%2026.pdf
Serves unincorporated King County and Black Diamond

RECEIVED MAY 31, 2018 WA. UT. & TRANS. COMM. ORIGINAL TG-180487 SUB 07/12/18

Tariff No. 26 17th Revised Page No. 21

Company Name/Permit Number: Rabanco LTD G-12
Registered Trade Name(s) Republic Services, Rabanco Companies, Sea Tac Disposal

Item 100 – Residential Service – Monthly Rates (continued on next page)

Rates in this item apply:

(1) To solid waste collection, curbside recycling (where noted) and yardwaste services (where noted) for residential property. This includes single family dwellings, duplexes, apartments, mobile homes, condominiums, etc., where service is billed directly to the occupant of each residential unit, and/or
(2) When required by a local government service level ordinance, solid waste collection, curbside recycling, and yardwaste service must be provided for single-family dwellings, duplexes, mobile homes, condominiums, and apartment buildings of less than 4 residential units, where service is billed to the property owner or manager.

Rates below apply in the following service area: **Appendix A**

Number of Units or Type of Containers	Frequency of Service	Garbage Service Rate	Recycle Service Rate	Yardwaste / Organics Service Rate			Optional Container Rental		
20 gallon can	WG/EOWR	$10.78	$7.06	$9.99			$0.44		
1 Can	WG/EOWR	$15.54	$7.06	$9.99			$0.55		
2 Can	WG/EOWR	$26.17	$7.06	$9.99			$1.11		
3 Can	WG/EOWR	$37.77	$7.06	$9.99			$1.66		
4 Can	WG/EOWR	$50.51	$7.06	$9.99			$2.22		
5 Can	WG/EOWR	$61.53	$7.06	$9.99			$2.77		
32 Gal Toter	WG/EOWR	$15.54	$7.06	$9.99			$1.11		
64 Gal Toter	WG/EOWR	$23.23	$7.06	$9.99			$1.66		
96 Gal Toter	WG/EOWR	$32.74	$7.06	$9.99			$1.66		
1 Can	MG/EOWR	$6.03	$7.06	$9.99			$0.55		
Recycle Only			$8.19						
Yardwaste Only				$11.00			$1.51		

Frequency of Service Codes: WG=Weekly Garbage; EOWG-Every Other Week Garbage; MG=Monthly Garbage; WR=Weekly Recycling
EOWR=Every Other Week Recycling; MR=Monthly Recycling; List others used by company

Note 1: Description/rules related to recycling program are shown on page23.
Note 2: Description/rules related to yardwaste program are shown on page 24.
Note 3: In addition to the recycling rates shown above, a recycling debit/(credit) of ($0.16)(A) applies.
Note 4: Recycling rates shown above are subject to an,additional recycling processing surcharge of **$0.45** per month.
The recycling processing surcharge on this page will expire: **December 31, 2018**

Recycling rates on this page expire on: January 31, 2019

Issued By: Rick Waldren, Business Unit Controller

Issue Date: June 15, 2018 Effective Date: August 1, 2018

(For Official Use Only)

Docket No. TG-_____ Date: _____ By: _____

FOR OFFICIAL USE ONLY
Docket: TG-180487
Granting Tariff Revisions per Order 01 in Docket TG-180487
Agenda Date: July 26, 2018
Effective Date: August 1, 2018

ORIGINAL

RECEIVED MAY 31, 2018 WA. UT. & TRANS. COMM. ORIGINAL TG-180487
SUB 07/12/18

Tariff No. 26 19th Revised Page No. 25

Company Name/Permit Number: Rabanco LTD G-12
Registered Trade Name(s) Republic Services, Rabanco Companies, Sea Tac Disposal

Item 100 -- Residential Service -- Monthly Rates (continued on next page)

Rates in this item apply:

(1) To solid waste collection, curbside recycling (where noted) and yardwaste services (where noted) for residential property. This includes single family dwellings, duplexes, apartments, mobile homes, condominiums, etc., where service is billed directly to the occupant of each residential unit, and/or
(2) When required by a local government service level ordinance, solid waste collection, curbside recycling, and yardwaste service must be provided for single-family dwellings, duplexes, mobile homes, condominiums, and apartment buildings of less than 4 residential units, where service is billed to the property owner or manager.

Rates below apply in the following service area: **Appendix B**

Number of Units or Type of Containers	Frequency of Service	Garbage Service Rate	Recycle Service Rate	Yardwaste Svc Rate (64 g can)	Yardwaste Organics (96 g can)			Optional Contains Rental		
20 gallon can	WG/EOWR/WYW	$10.76	$7.06	$12.39	$13.85			$0.44		
1 Can	WG/EOWR/WYW	$15.54	$7.06	$12.39	$13.85			$0.55		
2 Can	WG/EOWR/WYW	$26.17	$7.06	$12.39	$13.85			$1.11		
3 Can	WG/EOWR/WYW	$37.77	$7.06	$12.39	$13.85			$1.66		
4 Can	WG/EOWR/WYW	$50.51	$7.06	$12.39	$13.85			$2.22		
5 Can	WG/EOWR/WYW	$61.53	$7.06	$12.39	$13.85			$2.77		
32 Gal Toter	WG/EOWR/WYW	$15.54	$7.06	$12.39	$13.85			$1.11		
64 Gal Toter	WG/EOWR/WYW	$23.23	$7.06	$12.39	$13.85			$1.66		
96 Gal Toter	WG/EOWR/WYW	$32.74	$7.06	$12.39	$13.85			$1.66		
1 Can	MG/EOWR/WYW	$6.03	$7.06	$12.39	$13.85			$0.55		
Recycle Only			$8.19							
Yardwaste Only				$13.40	$14.86			$1.51		

Frequency of Service Codes: WG=Weekly Garbage; EOWG-Every Other Week Garbage; MG=Monthly Garbage; WR=Weekly Recycling
EOWR=Every Other Week Recycling, MR=Monthly Recycling. List others used by company.

Note 1: Description/rules related to recycling program are shown on page 29.
Note 2: Description/rules related to yardwaste program are shown on page 30.
Note 3: In addition to the recycling rates shown above, a recycling debit/(credit) of ($0.18) (A) applies.
Note 4: Recycling rates shown above are subject to an additional recycling processing surcharge of $0.45 per month.
The recycling processing surcharge on this page will expire: **December 31, 2018**

Recycling rates on this page expire on: January 31, 2019

Issued By: Rick Waldren, Business Unit Controller

Issue Date: June 15, 2018 Effective Date: August 1, 2018

(For Official Use Only)

Docket No. TG-_____ Date: _____ By: _____

FOR OFFICIAL USE ONLY
Docket: TG-180487
Granting Tariff Revisions per Order 01 in Docket TG-180487
Agenda Date: July 26, 2018
Effective Date: August 1, 2018

ORIGINAL

RECEIVED NOV 15, 2016 WA. UT. & TRANS. COMM. ORIGINAL TG-161216
SUB 12/14/16

Tariff No. 26 5th Revised Page No. 44

Company Name/Permit Number: Rabanco LFD G-12
Registered Trade Name(s) Republic Services, Rabanco Companies, Sea Tac Disposal

Item 230 – Disposal Fees

Charges in this item apply when other items in the tariff specifically refer to this item.

Disposal site (name or location)	Type of Material	Fee for Disposal
King County transfer stations and Landfills	garbage	$134.59 per ton (A)
King County transfer stations and Landfills	special waste	$162.00 per ton (A)
Rabanco Transfer Station	garbage	$134.59 per ton (A)
Rabanco Transfer Station	CDL	$92.23 per ton (A)
Black River Transfer Station	CDL	$80.60 per ton (A)
Cedar Grove Composting, Inc.	yardwaste	40.95 per ton (A)

State whether fees are per yard, per ton, etc. Include charges assessed for special commodities (tires, appliances, asbestos, etc.) or special conditions at each specific disposal site. Attach additional sheets as necessary.

Issued By: Rick Waldren, Division Controller

Issue Date: November 15, 2016 Effective Date: January 1, 2017

(For Official Use Only)

Docket No. TG-_____ Date. _____ By: _____

FOR OFFICIAL USE ONLY
Docket: TG-161216
Agenda Date: December 22, 2016
Effective Date: January 1, 2017

ORIGINAL

Waste Management of WA G-237
https://www.utc.wa.gov/regulatedIndustries/transportation/TransportationDocuments/WM%20-%20North%20Sound%20and%20WM%20-%20Marysville%20G-237%20Tariff%2019.pdf
Serves unincorporated King County and Woodinville

RECEIVED MAY 11, 2018 WA. UT. & TRANS. COMM. ORIGINAL TG-180415

Tariff No. 19 5th Revised Page No. 24
Company Name/Permit Number: Waste Management of Washington, Inc./G-237
Registered Trade Name: Waste Management – North Sound and Waste Management – Marysville

Item 100 – Residential Service -- Monthly Rates (Continued on next page)

Rates in this item apply

(1) To solid waste collection, curbside recycling and yardwaste collection services for residential property. This includes single family dwellings, duplexes, apartments, mobile homes, condominiums, etc., where service is billed directly to the occupant of each residential unit; and/or

(2) When required by a local government service level ordinance solid waste collection, curbside recycling, and yardwaste service must be provided for single-family dwellings, duplexes, mobile homes, condominiums and apartment buildings of less than 5 residential units, where service is billed to the property owner or manager.

(3) In the following service area: The service area required by King County Code Title10, contained in G-237 as described in Appendix A.

Number of Units or Type of Container	Frequency of Service (Note 2) (C)	Garbage Service Rate	Each Additional Cart	Recycle Service Rate	35 Gallon Yardwaste Service Rate	64 Gallon Yardwaste Service Rate	96 Gallon Yardwaste Service Rate
Mini-Can	WG/EOWR	$8.93		$8.82	$9.26	$10.35	$11.33
1 Can	MG/EOWR	$7.54		$8.82	$9.26	$10.35	$11.33
1 Can	WG/EOWR	$15.48		$8.82	$9.26	$10.35	$11.33
2 Cans	WG/EOWR	$24.72		$8.82	$9.26	$10.35	$11.33
3 Cans	WG/EOWR	$33.64		$8.82	$9.26	$10.35	$11.33
4 Cans	WG/EOWR	$42.49		$8.82	$9.26	$10.35	$11.33
5 Cans	WG/EOWR	$53.56		$8.82	$9.26	$10.35	$11.33
6 Cans	WG/EOWR	$63.52		$8.82	$9.26	$10.35	$11.33
1 20 gallon Cart	WG/EOWR	$10.61	$10.61	$8.82	$9.26	$10.35	$11.33
1 35 gallon Cart	WG/EOWR	$16.64	$16.64	$8.82	$9.26	$10.35	$11.33
1 35 gallon Cart	MG/EOWR	$8.01	n/a	$8.82	$9.26	$10.35	$11.33
1 64 gallon Cart	WG/EOWR	$26.11	$26.11	$8.82	$9.26	$10.35	$11.33
1 96 gallon Cart	WG/EOWR	$35.51	$35.51	$8.82	$9.26	$10.35	$11.33

Frequency of Service Codes: WG=Weekly Garbage, EOWR=Every Other Week Recycle, MG=Monthly Garbage

Description/rules related to recycling program are shown on page 26.
Description/rules related to yardwaste program are shown on page 26.
Notes for this item are on page 25.

Recycling rates shown above are subject to a recycling <credit>/debit of **<$1.62>** per month for customers in the service areas described in Appendices A and B.

Recycling commodity <credit> *(rebate)*/debit *(charge)* on this page expire: **December 31, 2018**

Recycling rates shown above are subject to an additional recycling processing surcharge of **$0.46 (A)** per month. The recycling processing surcharge on this page will expire: **October 31, 2018** (C)

Issued by: Michael A. Weinstein, Senior Pricing Manager, Pacific Northwest Market Area

Issue date: May 11, 2018 Effective date: August 1, 2018

(For Official Use Only)

Docket No. TG- _____ Date: _____ By: _____

FOR OFFICIAL USE ONLY
Docket: TG-180415
Agenda Date: July 26, 2018
Effective Date: August 1, 2018

ORIGINAL

RECEIVED OCT 14, 2016 WA. UT. & TRANS. COMM. ORIGINAL TG-161132

Tariff No. 19 1st Revised Page No. 39
Company Name/Permit Number: Waste Management of Washington, Inc./G-237
Registered Trade Name: Waste Management - North Sound and Waste Management - Marysville

Item 230 – Disposal Fees

Charges in this item apply when other items in the tariff specifically refer to this item.

Disposal site (name or location)	Type of Material	Fees for disposal
Snohomish County Transfer Stations	MSW	**$ 105.00** per ton
	Non-Recyclable CDL	**$ 105.00** per ton
	Special Waste	**$ 200.00** per ton
Shelco Transfer Station	MSW	**$ 105.00** per ton
	Non-Recyclable CDL	**$ 105.00** per ton
	Special Waste	**$ 200.00** per ton
King County Transfer Stations	MSW	**$ 134.59 (A)** per ton
	Special Waste	**$ 162.00 (A)** per ton
WM of Seattle Transfer Station	MSW	**$ 134.59 (A)** per ton
	CDL Waste	**$ 108.15** per ton

State whether fees are per yard, per ton, etc. Include charges assessed for special commodities (tires, appliances, asbestos, etc.) or special conditions at each specific disposal site. Attach additional sheets as necessary.

Issued by: Michael A. Weinstein, Senior Pricing Manager, Pacific Northwest Market Area

Issue date: October 14, 2016 Effective date: January 1, 2017

(For Official Use Only)

Docket No. TG- _____ Date: _____

FOR OFFICIAL USE ONLY
Docket TG-161132
Accepting Tariff Revisions per Order 01 Docket TG-161132
Agenda Date: December 8, 2016
Effective Date: January 1, 2017

ORIGINAL

Waste Management South Sound G-237
https://www.utc.wa.gov/regulatedIndustries/transportation/TransportationDocuments/WM%20South%20Sound%20and%20WM%20Seattle%20G-237%20Tariff%20No%2023.pdf
Serves unincorporated King County,

RECEIVED MAY 11, 2018 WA. UT. & TRANS. COMM. ORIGINAL TG-180409

Tariff No. 23 7th Revised Page No. 22

Company Name/Permit Number: Waste Management of Washington, Inc./G-237
Registered Trade Name: Waste Management – South Sound and Waste Management of Seattle

Item 100 – Residential Service – Monthly Rates (Continued on next page)

Rates in this item apply:

(1) To solid waste collection, curbside recycling and yardwaste collection services for residential property. This includes single family dwellings, duplexes, apartments, mobile homes, condominiums, etc., where service is billed directly to the occupant of each residential unit; and/or

(2) When required by a local government service level ordinance solid waste collection, curbside recycling, and yardwaste service must be provided for single-family dwellings, duplexes, mobile homes, condominiums and apartment buildings of less than 5 residential units, where service is billed to the property owner or manager.

(3) In the following service area: King County as described in Appendix A

Number of Units or Type of Container	Frequency of Service	Garbage Service Rate	Recycle Service Rate	35 Gallon Yardwaste Service Rate	64 Gallon Yardwaste Service Rate	96 Gallon Yardwaste Service Rate
Mini-Can(20 gal.)	MG/EOWR/WY	$7.82	$9.40	$10.00	$11.00	$12.20
1 Can	MG/EOWR/WY	$8.71	$9.40	$10.00	$11.00	$12.20
Micro-Can(10 gal)	WG/EOWR/WY	$9.67	$9.40	$10.00	$11.00	$12.20
Mini-Can(20 gal.)	WG/EOWR/WY	$11.23	$9.40	$10.00	$11.00	$12.20
1 Can	WG/EOWR/WY	$18.80	$9.40	$10.00	$11.00	$12.20
2 Cans	WG/EOWR/WY	$28.66	$9.40	$10.00	$11.00	$12.20
3 Cans	WG/EOWR/WY	$38.75	$9.40	$10.00	$11.00	$12.20
4 Cans	WG/EOWR/WY	$48.68	$9.40	$10.00	$11.00	$12.20
5 Cans	WG/EOWR/WY	$58.61	$9.40	$10.00	$11.00	$12.20
1 20 gallon cart	MG/EOWR/WY	$8.82	$9.40	$10.00	$11.00	$12.20
1 20 gallon cart	WG/EOWR/WY	$13.33	$9.40	$10.00	$11.00	$12.20
1 35 gallon cart	MG/EOWR/WY	$9.71	$9.40	$10.00	$11.00	$12.20
1 35 gallon cart	WG/EOWR/WY	$20.68	$9.40	$10.00	$11.00	$12.20
1 64 gallon cart	WG/EOWR/WY	$30.35	$9.40	$10.00	$11.00	$12.20
1 96 gallon cart	WG/EOWR/WY	$41.61	$9.40	$10.00	$11.00	$12.20

Frequency of Service Codes: WG=Weekly Garbage; EOWG=Every Other Week Garbage; MG=Monthly Garbage; EOWR=Every Other Week Recycling; WY=Weekly Yard Waste

Notes for this item are on page 23.
Description/rules related to recycling program are shown on page 24.
Description/rules related to yardwaste program are shown on page 24.

Recycling rates shown above are subject to a recycling <credit>/debit of **<$1.42>** per month for customers in the service areas described in Appendix A.
Recycling <credit>/debit adjustments above on this page expire: **December 31, 2018**

Recycling rates shown above are subject to an additional recycling processing surcharge of **$0.81 (A)** per month. The recycling processing surcharge on this page will expire: **October 31, 2018 (C)**

Issued by: Michael A. Weinstein, Senior Pricing Manager, Pacific Northwest Market Area

Issue date: May 11, 2018 Effective date: August 1, 2018

(For Official Use Only)

Docket No. TG- _____ Date: _____

FOR INTERNAL USE ONLY
Docket: TG-180409
Agenda Date: July 26, 2018
By
Effective Date: August 1, 2018

ORIGINAL

RECEIVED OCT 14, 2016 WA. UT. & TRANS. COMM. ORIGINAL TG-161134

Tariff No. 23 1st Revised Page No. 34
Company Name/Permit Number: Waste Management of Washington, Inc./G-237
Registered Trade Name: Waste Management - South Sound and Waste Management - Seattle

Item 230 – Disposal Fees

Charges in this item apply when other items in the tariff specifically refer to this item.

Disposal site (name or location)	Type of Material	Fees for disposal
King County Transfer Station	MSW	**$ 134.59 (A)** per ton
	Special Waste	**$162.00 (A)** per ton
WM of Seattle Transfer Station	MSW	**$ 134.59 (A)** per ton
	King County CDL Waste	**$ 108.15 (A)** per ton

State whether fees are per yard, per ton, etc. Include charges assessed for special commodities (tires, appliances, asbestos, etc.) or special conditions at each specific disposal site. Attach additional sheets as necessary.

Issued by: Michael A. Weinstein, Senior Pricing Manager, Pacific Northwest Market Area

Issue date: October 14, 2016 Effective date: January 1, 2017

(For Official Use Only)

Docket No. TG- _____ Date: _____ By: _____

FOR OFFICIAL USE ONLY
Docket: TG-161134
Granting Tariff Revisions per Order 01 Docket TG-161134
Agenda Date: December 8, 2016
Effective Date: January 1, 2017

ORIGINAL

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King County
Department of
Natural Resources and Parks
Solid Waste Division

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