

**Preliminary Transfer & Waste Export
Facility Recommendations**

And

**Estimated System Costs, Rate Impacts &
Financial Policy Assumptions**

Fourth Milestone Report

February 2006

Prepared by:
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in collaboration with the
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Solid Waste Advisory Committee
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and
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King County

Department of Natural Resources and Parks
Solid Waste Division

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Table of Contents

| <u>Chapter</u> | <u>Title</u> |
|-----------------|--|
| | Executive Summary |
| 1 | Introduction |
| 2 | Transfer Stations |
| 3 | Public-Private Options |
| 4 | Analysis of Landfill Capacity |
| 5 | Long-Haul Transport Options |
| 6 | Intermodal Facility(ies) |
| 7 | Sensitivity Analysis |
| 8 | Next Steps |
| | |
| <u>Appendix</u> | <u>Title</u> |
| A | Responsiveness Summary |
| B | ITSG Additional Issues |
| C | Forecasting Solid Waste Disposal |
| D | Financial Policies |
| E | Compacting Waste Feasibility Analysis |
| F | The Transfer Station Siting Process |
| G | Project Implementation Schedules |
| H | Level of Service Tables |
| I | Financial Projections |
| J | The Longer Term Outlook |
| K | Landfill Capacity |

ACRONYMS USED

| | |
|--------|--|
| BNSF | Burlington Northern and Santa Fe Railway |
| CDL | Construction, Demolition, and Landclearing (waste) |
| CSWMP | 2001 Comprehensive Solid Waste Management Plan |
| DBO | Design-Build-Operate (agreement) |
| DBOOT | Design-Build-Own-Operate-Transfer (agreement) |
| EIS | Environmental Impact Statement |
| FEMA | Federal Emergency Management Agency |
| FTS | Factoria Transfer Station |
| HTS | Houghton Transfer Station |
| ITSG | Interjurisdictional Technical Staff Group |
| KPG | KPG, Inc. – Consulting Civil Engineers and Architects |
| LOS | Level of Service |
| LRF | Landfill Reserve Fund |
| MMSW | Mixed Municipal Solid Waste |
| MSWMAC | Metropolitan Solid Waste Management Advisory Committee |
| PSCAA | Puget Sound Clear Air Agency |
| RCW | Revised Code of Washington |
| SEIS | Supplemental Environmental Impact Statement |
| SEPA | State Environmental Policy Act |
| SODO | South Downtown |
| SWAC | Solid Waste Advisory Committee |
| SWANA | Solid Waste Association of North America |
| SWD | Solid Waste Division |
| TS | Transfer Station |
| UP | Union Pacific Railroad |
| WTE | Waste to Energy |
| WUTC | Washington Utilities and Transportation Commission |

PRELIMINARY TRANSFER AND WASTE EXPORT FACILITY RECOMMENDATIONS

Executive Summary

This is the fourth and final milestone report in the waste export system plan development process as required by Ordinance 14971. The next step in the planning process is preparation of a Waste Export System Plan. The Waste Export System Plan will guide King County as it prepares the solid waste system for the next twenty years during which time the Cedar Hills Regional Landfill will close, the transfer system will be upgraded and readied for waste export, an intermodal facility or facilities will be added to the system, and King County's waste will be exported to an out-of-county disposal site.

The previous three milestone reports established level of service criteria for evaluating the existing solid waste transfer system (Milestone Report 1), applied the criteria to five of the county's urban transfer stations (Milestone Report 2) and described alternatives for public and private ownership and operation of transfer and intermodal facilities (Milestone Report 3). These reports were developed through an extensive collaborative planning process between the King County Solid Waste Division (division), King County Council staff, the Solid Waste Advisory Committee (SWAC), the Metropolitan Solid Waste Management Advisory Committee (MSWMAC), commercial solid waste haulers, and the labor unions representing Solid Waste Division employees.

Milestone Reports 1 and 2 identified the need to renovate King County's transfer system. As early as 1977, the King County Comprehensive Solid Waste Management Plan (CSWMP) identified a need to update and modernize the transfer system. Since that time two new facilities (Vashon and Enumclaw) have been constructed to replace two closed rural landfills. In 2006, construction of a new transfer facility on the site of the First Northeast Transfer Station in Shoreline will begin. Milestone Report 2 confirmed that the five urban transfer stations evaluated in this planning process (Algona, Bow Lake, Factoria, Houghton and Renton) failed to meet the level of service standards that were established in Milestone Report 1 and will need to be upgraded or relocated. This finding was not surprising since these facilities were constructed more than 40 years ago. Milestone Report 3 discussed issues concerning public and private ownership and operation of solid waste facilities in King County. It cites legal (case law, state law), regulatory (state RCW, county code), and contractual (labor contracts) constraints within which the county operates.

This fourth report identifies packages for transfer and intermodal facilities, long haul transport, and out-of-county disposal. It also discusses public and/or private ownership and operation of the transfer and intermodal facilities, provides an analysis of the remaining capacity of the Cedar Hills Regional Landfill, and presents a sensitivity analysis of three alternative disposal scenarios: partial early waste export; full early waste export; and withdrawal of 200,000 tons from the solid waste system.

Transfer System

Existing stations require improvements to address current and future capacity, service, and operational needs. During the planning process six transfer system packages were identified for analysis. The table below summarizes the six system configurations. Each package requires two new facilities at new sites, one each in Northeast Lake Washington and South King County. Each package also involves rebuilding some existing stations on their current sites. Facilities are identified by function. They can be full service (serving both commercial and self-haul customers) or single purpose facilities (serving either commercial customers only or self-haul customers only). The table also shows the number of facilities for each package. Note that the “Total # of Facilities” column in the table includes the five facilities that were not analyzed in the previous milestone reports (Cedar Falls, Enumclaw, First Northeast, Skykomish and Vashon) in order to illustrate the size of the whole system. The table also identifies the sites recommended for closure in each package. The Final Waste Export System Plan will contain a transfer system package recommendation.

All packages can be constructed by 2015 (assuming siting and design begin in 2007). There is no significant difference in the costs of the six packages through 2028. After 2028, when debt will be paid off, operating costs become the basis for comparison between the packages. There are significant differences in operating costs among the packages (see Chapter 2, “The Longer Term Outlook”). All packages can be financed and constructed within the Executive’s rate commitment of not increasing rates at Cedar Hills Landfill beyond inflation. Once the landfill closes and waste is exported, rates are expected to increase beyond the rate of inflation, as disposal costs are no longer within the control of the county.

| Pkg. | Full Service Facilities | Self-Haul Only | Commercial Only | Closed Facilities | Total # of Facilities |
|------|--|--|--|------------------------------|-----------------------|
| 1 | New South County New Bow Lake New Factoria/Eastgate New NE Lake WA | None | None | Algona Renton Houghton | 9 |
| 1A | New South County New Bow Lake New Factoria (no Eastgate) New NE Lake WA | None | None | Algona Renton Houghton | 9 |
| 2 | New South County New Bow Lake New Factoria/Eastgate | Houghton | New NE Lake WA | Algona Renton | 10 |
| 2A | New South County New Factoria/Eastgate | Houghton Renton | New NE Lake WA New Bow Lake | Algona | 11 |
| 3 | New South County New Bow Lake New NE Lake WA | Renton Houghton Factoria (no Eastgate) | None | Algona | 11 |
| 4 | New Factoria/Eastgate | Algona Renton Houghton | New South County New Bow Lake New NE Lake WA | None | 12 |

Public Private Options

This report summarizes the mix of public and private systems currently operating in Washington State and discusses the legal, regulatory and contractual context within which King County operates. State law mandates public oversight and authority for the planning and handling of solid waste. The ultimate mix of public and private facilities is not recommended in this report. A recommendation on whether transfer stations will be publicly and/or privately owned and/or operated will be included in the Final Waste Export System Plan.

Landfill Capacity

As a result of recycling efforts, operational efficiencies and garbage settlement at the Cedar Hills Regional Landfill, it is possible to operate the landfill until 2015, three years longer than previously projected. Disposal at the Cedar Hills Regional Landfill is the lowest cost disposal option for King County residents and businesses. This report identifies additional options for extending the life of the landfill beyond 2015 and postponing the higher cost of waste export. The options range from adding one to seven years of life to the landfill. All options to extend the life of Cedar Hills provide cost savings to the ratepayers of King County.

Extended landfill life also allows the county more time to make decisions about ownership and operation of an intermodal facility and for contracting for disposal services. However, decisions on upgrading the transfer system need to be made soon so that the siting and design process can begin no later than 2007. A modernized transfer system is not only necessary for waste export, but also necessary in order to operate efficiently.

Long Haul Transport

There are three options for transporting waste to a distant disposal site: truck, barge and rail. Preliminary analysis supports rail as the most cost effective long haul option. Further analysis closer to the time of waste export will be necessary to confirm this conclusion.

Intermodal

Once King County moves to waste export, an intermodal facility will become an integral component of the county's solid waste system. Sealed containers of solid waste will be trucked from transfer facilities to an intermodal facility where the containers will be loaded for transport to out-of-county disposal site(s).

Maintaining long term competition for waste services is key to keeping rates as low as possible once the county moves to waste export. This report discusses intermodal facility requirements, existing facilities, and options for public/private ownership and operation. Because of potential changes in the marketplace such as changes in long haul and disposal costs and fluctuating available intermodal capacity, it is prudent to defer the intermodal decision until the county is closer to moving to waste export.

Sensitivity Analysis

The sensitivity analysis of early waste export and withdrawal of solid waste from the system was not a requirement of Ordinance 14971 but is included here at the request of MSWMAC. The analysis considered partial early waste export of 200,000 tons of solid waste, early waste export of all tons generated in the King County solid waste system, and withdrawal of 200,000 tons of solid waste from the system. The analysis found that each of the three scenarios would result in increased costs to ratepayers. However, the revenue loss in the partial early export scenario could be partially offset by the resulting extension in the life of the landfill, deferring the higher costs of waste export. The division will conduct further analysis on the benefits and drawbacks of partial early export as part of the Final Waste Export System Plan.

Next Steps

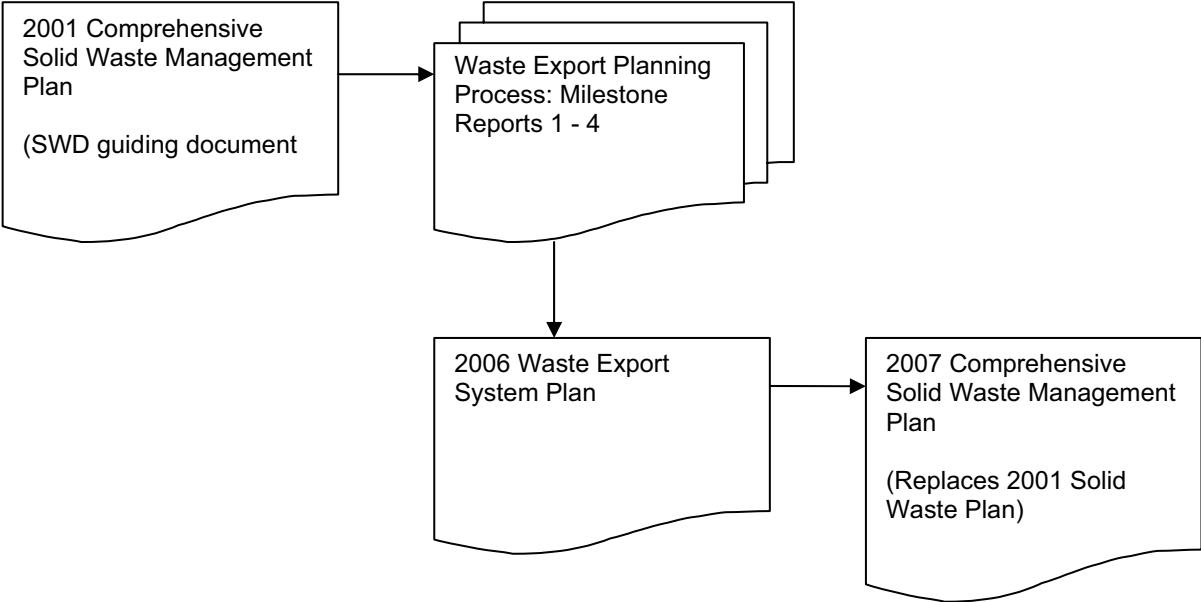
The division will continue the collaborative process in developing the Final Waste Export System Plan and the Comprehensive Solid Waste Management Plan. The Waste Export System Plan is scheduled to be transmitted to the King County Council by April 30, 2006, and will contain a recommendation on all aspects of the future solid waste export system except intermodal capacity. The ordinance also requires a third party independent review of Waste Export System Plan by an expert review panel procured by King County Council. In addition, the ordinance directs the Interjurisdictional Staff Group to prepare a report that addresses various solid waste governance and financial issues.

BACKGROUND

This report is the fourth in a series of four milestone reports to evaluate the existing regional solid waste system in King County and prepare for the future of solid waste transfer and disposal. The purpose of this report is to present options for the transfer system and for the move to waste export, the long-haul transport of solid waste to an out-of-county landfill for disposal, once the Cedar Hills Regional Landfill reaches capacity and closes. This report includes an analysis of the remaining capacity of Cedar Hills as well as estimated system costs, rate impacts, and financial policy assumptions. Subsequent to approval of this report, a Waste Export System Plan will be developed and transmitted to the Metropolitan King County Council by April 30, 2006.

Development of the Waste Export System Plan and the milestone reports has been guided by current county policy contained in the adopted 2001 Comprehensive Solid Waste Management Plan (CSWMP). The Waste Export System Plan will inform the next update of the CSWMP, which was initiated in December 2005 and is anticipated to be completed in 2007, as illustrated in Figure 1-1.

Figure 1-1. Plan Process



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CHAPTER 1. INTRODUCTION

Chapter Synopsis

This chapter describes the ordinance, the preceding milestone reports and the process that have led to this final milestone report. Also included is a description of the current planning policies that guide the Solid Waste Division in designing the future solid waste system. The chapter closes with a listing of the baseline planning assumptions that were used in analyzing possible configurations of the future system and in estimating costs and rate impacts.

Background

Ordinance 14971, which was adopted by the Metropolitan King County Council on July 26, 2004, outlined the process and timeline for development of the Waste Export System Plan. Ordinance 15218, adopted by the council on June 20, 2005, amended the deadline for that plan. The Waste Export System Plan is now scheduled to be transmitted to the council by April 30, 2006 and will include recommendations on the transfer system, intermodal facility(ies), waste export, and the remaining capacity of the Cedar Hills Regional Landfill.

In addition to the Waste Export System Plan, four milestone reports were required by the ordinances. Three of the milestone reports have been approved by the Regional Policy Committee, acting as the Solid Waste Interlocal Forum, and the King County Council. The first three milestone reports were:

1. Transfer System Level of Service Evaluation Criteria and Standards
2. Analysis of Transfer System Needs and Capacity
3. Public/Private Options for Ownership/Operation of Transfer and Intermodal Facilities

Ordinance 14971 envisioned a collaborative process for development of the milestone reports and Waste Export System Plan. This approach, described in the next section, has involved staff from the cities that are members of the county's solid waste system, Solid Waste Division staff, King County Council central staff, the King County Solid Waste Advisory Committee, the waste management industry, and labor. Each milestone report was developed using this collaborative approach, resulting in a more robust work product.

Collaborative Process

Ordinance 14971 established a cities advisory committee – the Metropolitan Solid Waste Management Advisory Committee or MSWMAC – and formalized staff group meetings by establishing the Interjurisdictional Technical Staff Group (ITSG) to advise and assist MSWMAC in its first year of operation.

To date, 17 cities have appointed representatives and alternates to MSWMAC. The member cities are Algona, Auburn, Bellevue, Bothell, Burien, Covington, Federal Way, Kirkland, Lake Forest Park, Mercer Island, Newcastle, Redmond, Renton, SeaTac, Shoreline, Tukwila and Woodinville. Some cities appointed elected officials as their representatives. These cities were Algona, Auburn, Burien, Covington, Federal Way, Kirkland, Lake Forest Park, and Newcastle. The remaining members appointed staff to the committee.

ITSG comprises Solid Waste Division staff, King County Council central staff, and staff from Auburn, Bellevue, Federal Way, Kirkland, Redmond, Renton, SeaTac, Tukwila and Woodinville. While the Solid Waste Division only staffs MSWMAC, it is a participating member of ITSG.

MSWMAC has been meeting monthly since January 2005. ITSG meetings have been as frequent as weekly. While the first milestone report was approved by the King County Council prior to the first meeting of MSWMAC, MSWMAC and the county approved the second, third and fourth milestone reports by motion.

In addition to ITSG and MSWMAC, the Solid Waste Division has been working with the King County Solid Waste Advisory Committee (SWAC) on the Waste Export System Plan. SWAC members represent King County citizens, the waste management industry, manufacturers located in King County, recycling businesses, local elected officials, labor, and marketing. SWAC, which meets monthly, provided input into the development of each of the milestone reports and approved them. See Appendix A, Responsiveness Summary, for a summary of comments and responses.

The division has met with the waste management companies (Rabanco/Allied, Waste Management, and Waste Connections) individually and in joint sessions. The companies have provided comments on each of the reports. Additionally, two of the waste management companies (Rabanco/Allied and Waste Management) have representatives who are active members on SWAC.

The division has invited business representatives from each union local that represents Solid Waste Division employees to briefings. To date, representatives from Local 17 and Teamsters Locals 117 and 174 have attended these briefings. Teamsters Locals 117 and 174 have representatives who are active members on SWAC.

The Solid Waste Division also sought the input of neighboring jurisdictions (City of Seattle and Snohomish County) in developing the milestone reports.

The Solid Waste Division appreciates the time and attention everyone involved in the Waste Export System Plan process has devoted to planning the future of the solid waste system and believes the result of the collaborative process will be a system that will continue to provide rate payers with quality services at reasonable rates well into the future.

Policy Framework, Purpose, and Goals

The King County Solid Waste Division manages waste disposal for approximately 1 million tons of garbage per year. This represents the waste generated by more than 1.2 million residents and companies that employ 637,000 people in King County. The division is guided by the 2001 King County Comprehensive Solid Waste Management Plan (CSWMP), which was adopted by the Department of Ecology, King County Council, and the cities. This plan directs the division to export the county's solid waste to one or more landfills outside of the county once the Cedar Hills Regional Landfill reaches permitted capacity and closes. The adopted CSWMP rejected alternatives to waste export, including development of a new landfill in King County or incinerating the county's waste. At the same time, council directed that the division begin planning for waste export.

Planning policies related to waste export direct the division to, among other things:

- Evaluate the division's current transfer stations,
- Plan a future transfer station system,
- Investigate disposal options outside of King County,
- Evaluate rail, barge, and truck hauling options for waste export,
- Review public/private ownership options,
- Analyze financing, staffing, and rate impacts,
- Define facility siting processes,
- Establish means of involving interested parties in the planning process, and
- Develop a Waste Export System Plan to document the planning process and explain recommendations for a future system.

The Waste Export System Plan will guide King County's solid waste handling system for the future. The system will:

- Keep garbage rates low and stable,
- Make existing facilities as efficient as possible, and
- Ensure that facilities keep pace with growth in customer base.

Baseline Assumptions

The planning assumptions below were used to inform the analysis of system configuration, estimated costs, and rate impacts called for in Ordinance 14971. A number of other issues were also identified by ITSG and MSWMAC for consideration in developing Milestone Report #4. A list of those issues is included as Appendix B. Discussion of these issues has been incorporated into the appropriate sections of the report.

Waste Stream Assumptions

- The division will develop annual tonnage forecasts for disposal and recycling streams through the 20 year planning horizon based on forecasts of population growth, annexations, regional economy and recycling rates. The forecast is an assumption (See Forecast, Appendix C).

- The private sector currently has and will continue to have primary responsibility for capital investment and operating expenses related to waste reduction and recycling and construction, demolition and landclearing (CDL) waste.
- All mixed municipal solid waste (MMSW) generated in King County outside the boundaries of the cities of Seattle and Milton currently is disposed at the Cedar Hills Regional Landfill, and will continue to be until it reaches capacity.

Landfill Capacity Assumptions

- A new solid waste landfill will not be sited by King County.
- If waste continues to be disposed at Cedar Hills Regional Landfill at the current rate and using current practices, then it will reach permitted capacity in 2015.

Transport Assumptions

- Transportation costs of compacted waste are lower than transportation costs of uncompacted waste.
- For the purposes of the analyses for Milestone Report #4, the average payload of compacted waste will be 27 tons per intermodal container. The average payload for uncompacted waste will be 18 tons per container.

Transfer Assumptions

- Based on analysis already completed in the first two milestone reports and in the Northeast Lake Washington Feasibility Study (April 2004), new transfer capacity is needed for the Northeast Lake Washington area.
- Based on analysis already completed in the first two milestone reports, new transfer capacity is needed for South King County.
- Efficient solid waste handling requires transfer of waste from collection trucks or self-haul vehicles before it is transported to a disposal facility.

Financial Assumptions

- The Waste Export System Plan will be developed based on the assumption of a federated system with 37 interlocal agreements in place through 2028. Per Milestone Report #3, a sensitivity analysis will be performed and 'will include a comprehensive assessment and analysis so that the future size and configuration of the solid waste system can be developed' (see Appendix D for current financial policies).

Additional Analysis

The analysis based on these assumptions also serves as a baseline for comparing other options and analyses that MSWMAC has recommended be included in Milestone Report #4. These other options include:

- a) Partial or full waste export before the Cedar Hills Regional Landfill reaches its permitted capacity,

- b) The potential to extend the useful life of the Cedar Hills Regional Landfill through operational, policy, or permit changes, and
- c) A sensitivity analysis that illustrates the effects of reduced tonnage on system size, configuration, costs, and rates.

Analysis of the above options is presented in Chapter 7.

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CHAPTER 2. TRANSFER STATIONS

Chapter Synopsis

As concluded in Milestone Report 2, the existing transfer station system does not meet level of service criteria in several areas. Upgrades to the system are needed to meet future solid waste handling needs including eventual waste export. This chapter describes King County's current transfer station system by geographic location, and by customer characteristics. It then describes options for the system by geographic area and finally presents six transfer station *system* configurations, referred to as packages, with various combinations of full service, commercial only, and self-haul only facilities. The details of each package include information regarding redirected tonnage, operating costs, construction costs, capital project schedules, and financing/debt service assumptions. The costs for each package are presented as well as the impacts to projected disposal rates.

Transfer System Geographic Areas

For purposes of this report, geographic areas of King County are identified as Rural, South County, Central County, Northeast Lake Washington, and North County. The transfer and drop box facilities included in each geographic area are:

Rural

- Cedar Falls Drop Box
- Enumclaw Transfer Station
- Skykomish Drop Box
- Vashon Island Transfer Station

South County

- Algona Transfer Station

Central County

- Bow Lake Transfer Station
- Renton Transfer Station

Northeast Lake Washington

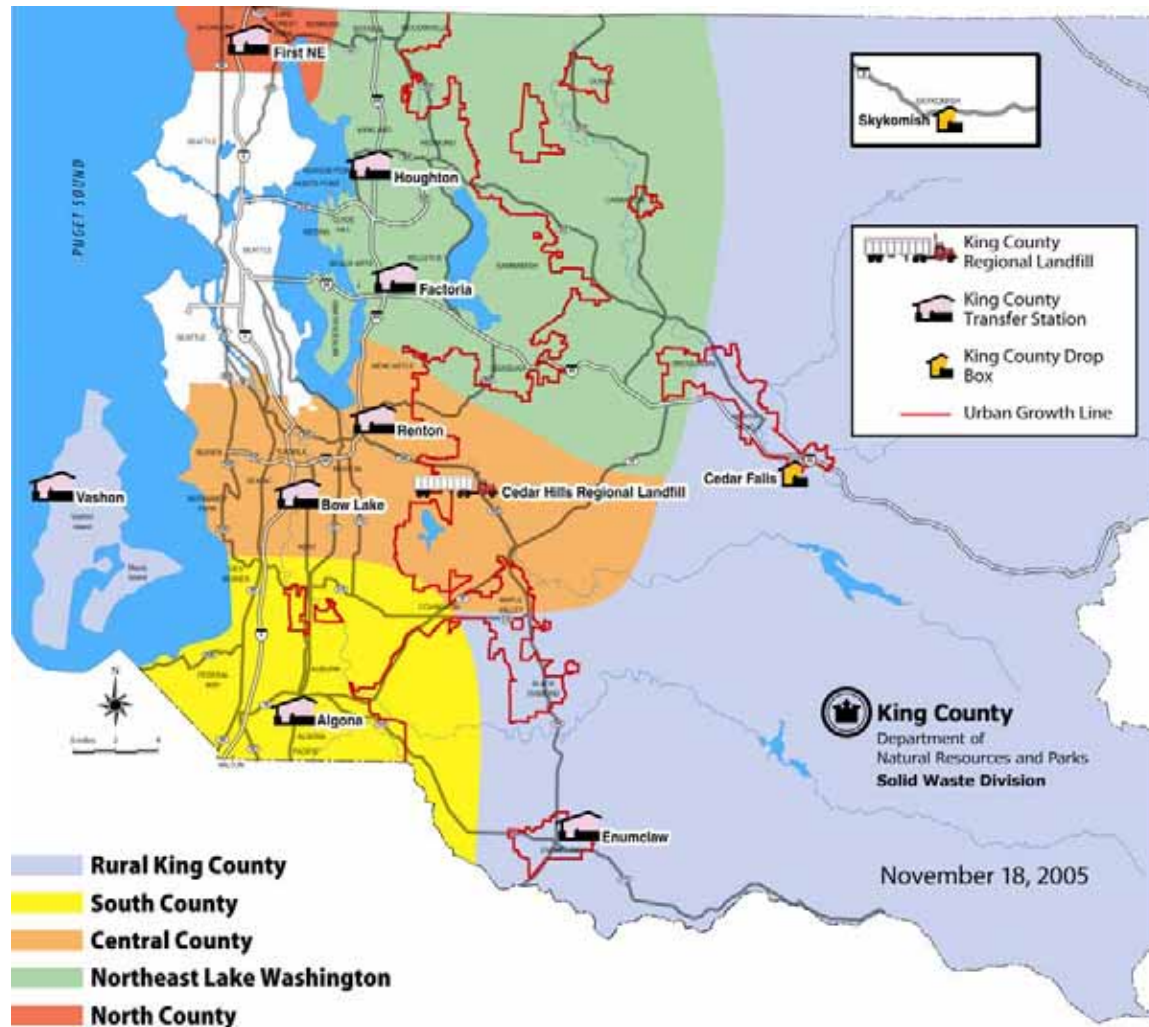
- Factoria Transfer Station
- Houghton Transfer Station

North County

- First Northeast Transfer Station

Figure 2-1 shows the locations of the county system's transfer and drop box facilities and the Cedar Hills Regional Landfill in their respective geographic area.

Figure 2-1. Locations of Solid Waste Facilities by Geographic Area



Each facility generally serves the urban or rural areas that surround it, but these areas are not rigidly defined. Solid waste systems are most cost-effective when transfer stations are distributed in such a way that collection trucks spend less time traveling from their garbage collection routes to disposal sites. When transfer stations are well located, costs for labor, fuel, and collection vehicle maintenance are reduced. Well-sited facilities mitigate environmental, infrastructure, and traffic issues.

Existing Solid Waste Transfer System

This section describes the county’s existing solid waste transfer system, describes where improvements or additional capacity are needed, and presents four potential transfer station system improvement packages for the Northeast Lake Washington, Central and South King County areas.

Transfer facilities are designed to serve four main functions:

1. Provide geographically dispersed, convenient, and safe collection points around the county for mixed municipal solid waste (MMSW) from both commercial and self-haulers.
2. Provide collection points for recyclable materials and household hazardous waste from self-haulers.
3. Reduce traffic on the highways and at the landfill by allowing smaller loads to be consolidated into fewer, larger loads for transport.
4. Minimize collection costs by conveniently locating facilities closer to where the waste is generated.

The transfer system currently consists of eight transfer stations (six urban and two rural) serving both self-haul and commercial customers, and two rural drop boxes. The two rural transfer stations are relatively new and are equipped with compactors. All of the other transfer stations were sited, designed and built in the 1960's and 1970's, when garbage trucks were smaller, recycling was not yet part of the solid waste system and the population was much smaller. Most of the county's MMSW is processed through these facilities before being transported for disposal at Cedar Hills Regional Landfill.

Previous milestone reports provided an evaluation of a portion of the existing transfer system. The stations were assessed using 19 criteria that addressed the following categories:

- Level of service to users
- Station capacity to handle solid waste and recyclables,
- Local and regional effects of the facility, and
- Cost.

The results of the assessment of criteria 1-16 were presented in the second milestone report and are included here as well (see Table 2-1). Criterion 17, Local and Regional Considerations, was transmitted as an addendum to Report 2. Criteria 18 and 19, cost and rate impacts, are part of this analysis and are presented at the end of this chapter.

The ultimate goal of assessing the existing stations was to allow the county to determine when:

- 1) A transfer station needs to be upgraded in place
- 2) A station needs to be relocated to a more appropriate location
- 3) Additional transfer stations need to be built to adequately serve the region's growing population.

Assessment of the transfer stations yielded a yes/no finding (i.e., the station does or does not meet the standard set for the criterion) as reflected in Table 2-1.

Three of the division's eight transfer stations were not evaluated because they are either relatively new or are in the process of being rebuilt. These three stations meet, or will meet,

all the standards established for evaluation of the older transfer stations. Enumclaw and Vashon transfer stations in the Rural area meet the criteria and the First NE station in the North area is scheduled to be rebuilt beginning in 2006.

Table 2-1. Level of Service Criteria Applied to Existing Transfer Stations

| | | Algona | Bow Lake | Factoria | Houghton | Renton |
|---|--------------|--------|----------|----------|----------|--------|
| 1. Estimated time to a transfer facility within the service area for 90% of users. | < 30 min=yes | YES | YES | YES | YES | YES |
| 2. Time on site meets standard for 90% of trips | | | | | | |
| a. commercial vehicles | < 16 min=yes | NO | YES | NO | NO | NO |
| b. business self haulers | < 30 min=yes | YES | NO* | NO* | NO* | YES |
| c. residential self haulers | < 30 min=yes | YES | NO* | YES | YES | YES |
| <i>* Meets criterion weekdays, but not weekend days</i> | | | | | | |
| 3. Facility hours meet user demand | YES/NO | YES | YES | YES | YES | YES |
| 4. Recycling services ...meet policies in SW Comp Plan | | | | | | |
| a. business self haulers | YES/NO | NO | NO | NO | NO | NO |
| b. residential self haulers | YES/NO | NO | NO | NO | NO | NO |
| 5. Vehicle capacity | | | | | | |
| a. meets current needs | YES/NO | NO | YES | NO | NO | YES |
| b. meets 20 year forecast needs | YES/NO | NO | NO | NO | NO | NO |
| 6. Average daily handling capacity (tons) | | | | | | |
| a. meets current needs | YES/NO | NO | NO | YES | NO | YES |
| b. meets 20 year forecast needs | YES/NO | NO | NO | NO | NO | YES |
| 7. Space for 3 days' storage | | | | | | |
| a. meets current needs | YES/NO | NO | NO | NO | NO | NO |
| b. meets 20 year forecast needs | YES/NO | NO | NO | NO | NO | NO |
| 8. Space exists for station expansion | | | | | | |
| a. inside the property line | YES/NO | NO | YES | YES | YES | YES |
| b. on available adjacent lands through expansion | YES/NO | YES | YES | YES | NO | NO |
| 9. Minimum roof clearance of 25 feet | YES/NO | YES | YES | NO | NO | YES |
| 10. Meets facility safety goals | YES/NO | NO* | NO* | NO* | NO* | NO* |
| <i>* The presence of these physical challenges does not mean that the stations operate in an unsafe manner. It does mean that it takes extra effort by staff and management, which reduces system efficiency, to ensure the facilities are operated safely.</i> | | | | | | |
| 11. Ability to compact waste | YES/NO | NO | NO | NO | NO | NO |

| | | Algona | Bow Lake | Factoria | Houghton | Renton |
|---|---|--------|----------|----------|----------|--------|
| 12. a. Meets goals for structural integrity | YES/NO | YES | YES | YES | YES | YES |
| | b. Meets FEMA immediate occupancy standards | YES/NO | YES | NO | NO | YES |
| 13. Meets applicable local noise ordinance levels | YES/NO | YES | YES | YES | YES | YES |
| 14. Meets PSCAA standards for odors | YES/NO | YES | YES | YES | NO* | YES |
| <i>* One complaint on Houghton was verified within the previous 2 years. No citation was issued.</i> | | | | | | |
| 15. Meets goals for traffic on local streets | a. Meets LOS standard | YES/NO | YES | NO | YES | YES |
| | b. Traffic does not extend onto local streets 95% of time | YES/NO | NO* | NO* | NO* | YES |
| <i>* Meets criterion weekdays, but not weekend days. Yes or No rating based on evaluating all days w/in study period.</i> | | | | | | |
| 16. 100 foot buffer between active area & nearest residence | YES/NO | YES | YES | YES* | NO | YES |
| <i>* Meets 100 ft from residence criterion, but business within 100 ft.</i> | | | | | | |
| 17. Transfer station is compatible with surrounding land use.* | YES/NO | YES | YES | NO** | NO*** | YES |
| <i>*See Appendix H for details of Criterion 17. **FTS is a 30+ year old facility suffering from deferred maintenance. It is visible on the approach to adjacent businesses. This is a close call as the neighborhood is primarily commercial/industrial. Meets criterion weekdays, but not weekend days. Yes or no rating based on evaluating all days within study periods. ***HTS is a 30+ year old facility suffering from deferred maintenance. It is in a residential/recreational area and clearly visible from the road. One verifiable odor complaint was received in the last two years. Transfer station parking is located within 100 feet of nearest residence.</i> | | | | | | |

Although the evaluation concluded that the existing stations do not meet many of the standards, through mitigation efforts at the operational level, the facilities do meet all local and state health and safety requirements.

As reflected in Table 2-1, the current system of stations is efficiently distributed throughout King County with adequate service hours that meet the needs of our customers. However, most stations require improvements to address current capacity, service, and operational needs. Structural changes to improve emergency response, and future operational efficiency as well as meet desired safety goals are also necessary.

Transfer System Customer Characteristics

Planning for waste export requires a thorough examination of the transfer stations and their readiness to export more than one million tons of municipal waste to a disposal facility other than the Cedar Hills Regional Landfill. Consideration of transfer station improvements must also take into account the types of customers that use the current system.

Customer Types

Different customer types use transfer stations in different ways and have different service needs. These differences are largely distinguished by the type of vehicle a customer uses. A station that serves both self-haul and commercial customers (known as a full service facility) has very different operational requirements than a station that serves only one customer type. This report defines the customer types as follows:

Commercial

Commercial customers use packer and drop box vehicles that have automated unloading capability and deliver an average of 5 tons each per vehicle. They are haulers that have a certificate granted by the Washington Utilities and Transportation Commission (WUTC) for the purpose of serving residential and business collection routes. Commercial customers use transfer stations most heavily on weekdays, as shown in Figure 2-2.

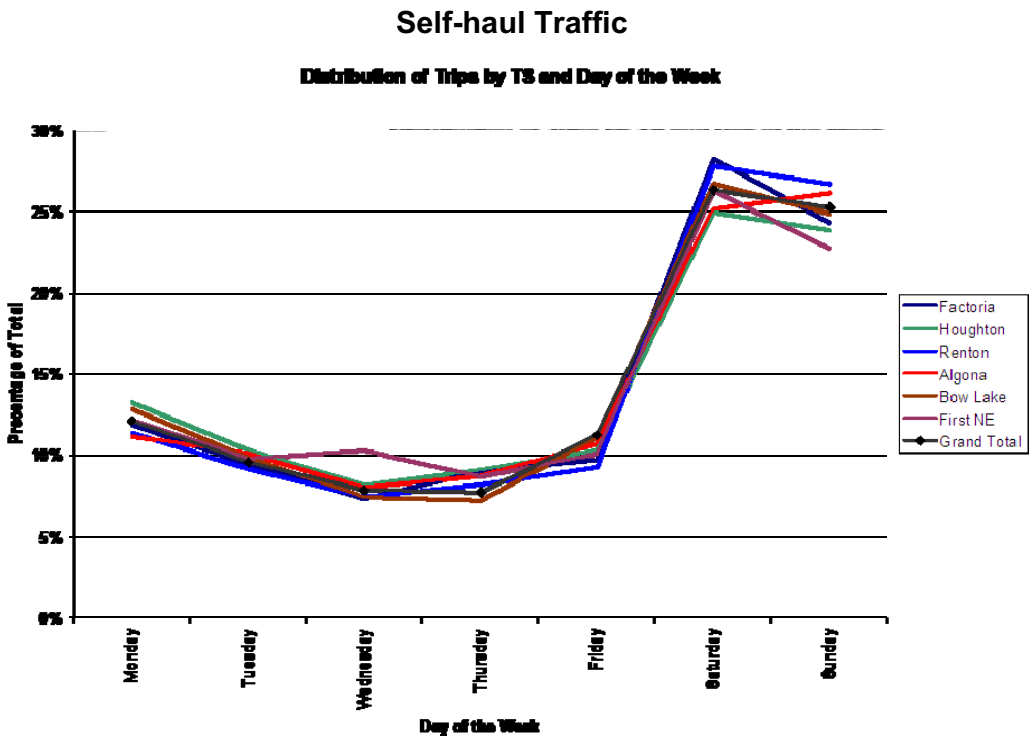
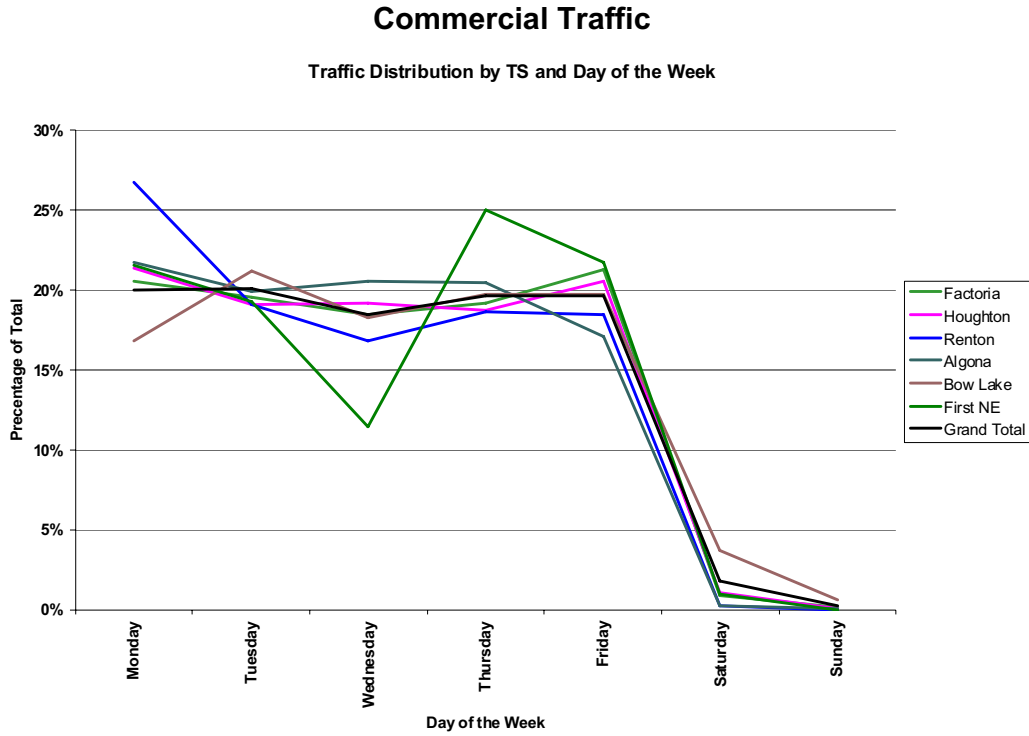
Self-haul

Self-haul customers fall into two categories, business and residential.

1) Business self-haul: Business self-haulers generally bring more than a ton of waste to the transfer station and may use vehicles that are unloaded manually or automatically. An example of the first group would be a small landscaping business that uses a pick up truck and must unload the yard debris by hand. An example of the second group would be a school district that uses an automated truck to dump its load. Both are self-haulers, but with very different impacts to the transfer station during unloading because their method of unloading varies. This distinction is important because a business self-hauler with an automated truck has service requirements more similar to commercial customers than residential self-haulers. Business self-haulers that use automatically unloading vehicles could use commercial only transfer stations without impacting operations at those facilities. Business self-haulers use transfer stations primarily on weekdays.

2) Residential self-haul: Residential self-haulers use vehicles that require manual unloading and generally bring less than a ton of waste to the transfer station in each load. Most self-haul traffic comes to transfer stations on weekends, as shown in Figure 2-2.

Figure 2-2. Traffic by Day of the Week and Customer Type



Based on 2005 data, Table 2-2 shows the percentage of tonnage received by type of customer at each of the transfer station facilities in the South County, Central County, and Northeast Lake Washington areas:

Table 2-2. Tonnage by Customer Type

| Facility | Commercial Tonnage | Business Self-Haul Tonnage | Residential Self-Haul Tonnage |
|----------|--------------------|----------------------------|-------------------------------|
| Algona | 76% | 1.0% | 23% |
| Bow Lake | 85% | 2.0% | 13% |
| Factoria | 80% | 0.4% | 20% |
| Houghton | 79% | 1.0% | 20% |
| Renton | 77% | 1.0% | 22% |

Note that these numbers reflect only data from garbage customers. Recycling customers also add traffic to a facility. Despite delivering only about 20% of the system tonnage, self-haulers comprise approximately 80% of the vehicle traffic. Self-haulers can take twice as long as commercial customers per transaction (enter, unload, pay, and exit a facility) on average.

Waste Compaction

None of the existing transfer station facilities in the Northeast Lake Washington, Central or South King County areas are equipped with compactors. Based on the assumption that compacting waste increases disposal efficiencies and reduces transportation costs, analysis was done on the feasibility of installing compactors at these facilities.

The result of this analysis was a determination that although all stations have the physical space to install waste compactors, the Algona, Factoria, and Renton sites are too constrained to allow trailer maneuvering necessary to receive the compacted waste from the compactor equipment. Houghton has adequate vehicle maneuvering capacity. However, installation of compactors at any of the existing stations except Bow Lake would reduce station vehicle capacity by approximately seventy-five percent. This is because the number of available stalls for vehicles to unload their waste would be reduced from 16 to 4. This would significantly affect the station's ability to process tonnage. Finally, the retrofit costs involved with installing a compactor at Bow Lake site would be so significant that it would be more cost effective to rebuild the facility.

The relevant details of the compactor analysis are in Appendix E.

Transfer Station Improvement Options

The first step of the analysis was to define potential ways to serve each of the three geographic areas where existing transfer stations require improvements. The range of possibilities include: new stations, station closures; designation of stations as single purpose, either self-haul only or commercial only; or full service facilities (commercial and self-haul combined). After the options were identified, the next step was to develop potential packages of facility configurations for the three geographic areas.

South County-Algona Transfer Station

South King County is currently served by the Algona Transfer Station. Report Two concluded that this facility cannot be expanded or upgraded due to physical constraints of the site. Options for improvement in South County include:

1. Close the Algona Transfer Station and build a new station at a new site that provides both self-haul and commercial service.
2. Retain the Algona Transfer Station as an uncompacted self-haul service only facility and build a new station at a new site for commercial customers.

Central County- Bow Lake and Renton Transfer Stations

Central King County is currently served by the Bow Lake and Renton Transfer Stations. Report Two concluded that Bow Lake cannot be retained effectively as-is but can be rebuilt on-site. The division is currently in the process of securing additional land adjacent to the Bow Lake facility that would make the needed improvements possible.

Report Two concluded that Renton does not have space for expansion on adjacent property. Options for improvement in Central County include:

Bow Lake

1. Replace the facility with a new station at the current site and provide both commercial and self-haul service at that site.
2. Replace the facility with a new station at the current site and provide commercial service only

Renton

1. Close the facility.
2. Retain as an uncompacted self-haul only service facility.

Northeast Lake Washington- Houghton and Factoria Transfer Stations

The Northeast Lake Washington area is currently served by the Houghton and Factoria Transfer Stations. Report Two concluded that Houghton does not have space for expansion, but Factoria could be rebuilt at the Eastgate site. The division purchased the Eastgate site for that purpose after a formal siting process that included evaluation of alternative sites and preparation of an EIS. Options for improvement in the Northeast Lake Washington area include:

1. Close Houghton, build a new station at a new site for both commercial and self-haul customers, and build a new station on the combined Factoria/Eastgate property for commercial and self-haul customers.
2. Retain Houghton as an uncompacted self-haul only service facility, build a new station at a new site for commercial customers only, and build a new station on the combined Factoria/Eastgate property to provide both commercial and self-haul service.
3. Retain Factoria and Houghton as uncompacted, self-haul only facilities and build one new station at a new site that provides all commercial service for the entire geographic area as well as self-haul service. This option does not develop the Eastgate property and assumes the property will be sold.
4. Close Houghton, build a new station at a new site for both commercial and self-haul customers, and build a new station on the existing Factoria property for commercial and self-haul customers.

Intermodal Co-location

At the time of waste export, waste will be transported from transfer stations to an intermodal facility(ies) where it will be sent to an out-of-county disposal facility. (See chapter six for a discussion of intermodal facilities.) The option of co-locating a transfer station with an intermodal facility combines two activities:

1. Transfer of waste from smaller loads into larger export-ready containers, presumably compacting the loads.
2. Loading these containers onto rail cars, barges, or chassis trailers for long-haul transport to a disposal facility.

A co-located or direct-to-intermodal facility provides both transfer service to the nearby geographic area generating the waste and also intermodal service for the region, receiving containerized wastes and shipping them to remote disposal locations. The intermediate short-haul from one transfer station to an intermodal facility would be eliminated. However, a co-located facility would not eliminate the need for other transfer stations in the county's system.

Two site requirements for a co-located transfer station and intermodal facility are:

- 1) The site needs to be large enough parcel to allow for both transfer and intermodal operations and
- 2) The site needs to accommodate the selected long-haul transport mode, whether rail, barge or truck.

Until a specific site is identified that meets both of these requirements, it is not possible to analyze the impacts of co-locating a transfer station and intermodal facility.

In 2003, King County purchased the Fisher Mill site on Harbor Island as a potential site for a future intermodal facility. This site is not being evaluated further at this time. During the

siting process, the Fisher Mill site will be evaluated together with other sites that have not yet been identified.

Appendix F describes a transfer station siting process that has been used by King County in the past and is a potential model for siting future facilities. This process could be adapted for siting a co-located transfer station and intermodal facility.

Analysis of Potential Transfer Station Packages

Transfer station options must be viewed in the context of a system. Decisions in one area affect the entire region. Options for each geographic area were combined into system-wide packages for analysis.

In the following pages, six transfer station packages are described. The packages were developed through an iterative process with the Solid Waste Advisory Committee, the Metropolitan Solid Waste Management Committee, the Interjurisdictional Technical Staff Group, the commercial haulers and labor unions representing Solid Waste Division staff. Package 1A data is incomplete and cannot be fully compared to the other packages at this time. See Package 1A description on page 2-15. All other packages share the following:

- They can be financed while still meeting the Executive's rate commitment that per ton *disposal rates at Cedar Hills* will not be increased by more than the rate of inflation (base year 1999 – the last time rates were changed). *Note: once waste export begins, the county will have less control over disposal costs.*
- Construction can be accomplished by 2015 assuming that work begins no later than 2007. See Appendix G for construction timelines.
- They are technically feasible.
- Two new sites are required, one in the Northeast Lake Washington area and one in South King County.
- Station closures or conversions would not occur under any package until replacement facilities are open.
- The impact of the transfer station packages on both collection costs (garbage collection by private haulers) and short haul costs (cost of transporting waste between transfer stations and disposal or intermodal facility(ies)) as well as the potential impact on customer rates will vary depending on the location of the selected new sites.
- They directly address the five urban transfer stations that are covered in Reports 1 and 2. The First Northeast facility and the four rural facilities are excluded from this analysis. Proposed operations will remain the same at the First Northeast facility (soon to be reconstructed) and current operations at the four rural facilities will not change.
- All new facilities proposed across these four packages include the installation of one or more compactors.
- Additional studies will be necessary to ensure that level of service criteria will be met at all new facilities, and at existing sites such as Factoria and Bow Lake. The division recognizes that traffic is a particular concern at all sites in King County, and will perform studies and work with stakeholders to mitigate for traffic as necessary.

It is important to note that not all impacts of the various alternatives presented here can be fully quantified at this stage, largely because of the unknown locations of new facilities. As noted previously, Appendix F includes a generic siting process that King County has used in the past to site transfer stations and that may serve as a model for siting future facilities.

The packages described in the following pages are summarized in Table 2-3, listing each facility by type (self-haul only, commercial-haul only, or full service) and listing facilities that would be closed in the geographic areas of Northeast Lake Washington, Central, and South King County areas. The resulting total number of system facilities includes the three transfer and two drop box facilities in the North and rural King County areas.

Table 2-3. Package Summary

| Pkg. | Full Service Facilities | Self-Haul Only | Commercial Only | Closed Facilities | Total # of Facilities |
|------|--|--|--|------------------------------|-----------------------|
| 1 | New South County New Bow Lake New Factoria/Eastgate New NE Lake WA | None | None | Algona Renton Houghton | 9 |
| 1A | New South County New Bow Lake New Factoria (no Eastgate) New NE Lake WA | None | None | Algona Renton Houghton | 9 |
| 2 | New South County New Bow Lake New Factoria/Eastgate | Houghton | New NE Lake WA | Algona Renton | 10 |
| 2A | New South County New Factoria/Eastgate | Houghton Renton | New NE Lake WA New Bow Lake | Algona | 11 |
| 3 | New South County New Bow Lake New NE Lake WA* | Renton Houghton Factoria (no Eastgate) | None | Algona | 11 |
| 4 | New Factoria/Eastgate | Algona Renton Houghton | New South County New Bow Lake New NE Lake WA | None | 12 |

Self-haul Only Facilities

Several of the packages include proposals for using existing transfer stations (Algona, Factoria, Houghton, and Renton) as self-haul only facilities with minimal or no additional capital investment. Installation of compactors at self-haul only stations was not included in these packages. Analysis concluded that retrofitting existing transfer stations with compactors not only would reduce capacity by 75%, but is not technically feasible due to site constraints (see Appendix E). To minimize capital costs as well as to avoid reductions in traffic capacity, only two of these projects involve new capital expenses: a new roof at Factoria and a new retaining wall at Algona.

Although self-haul and commercial customer traffic at the transfer stations peak at different times, many of the deficiencies identified in Table 2-1 “Level of Service Criteria Applied to Existing Transfer Stations” are directly attributable to conflicts arising from commercial and self-haul customers queuing entering, dumping and exiting the constrained spaces of the existing facilities at the same time. Self-haul only facilities do not have the same requirements as full service facilities. The criteria in Table 2-1 were reapplied to the existing facilities proposed to be self-haul only in a new table that appears in Appendix H.

Transfer System Package Descriptions

Package 1

| Full Service Facilities | Self-Haul Only | Commercial Only | Closed Facilities |
|---|----------------|-----------------|------------------------------|
| New South County (new location) New Bow Lake (existing site) New Factoria/Eastgate (existing site) New NE Lake WA (new location) | None | None | Algona Renton Houghton |

Package 1 would provide for the construction of four new full service transfer facilities and the closure of three existing facilities. The total number of transfer facilities in the King County system would be reduced by one – from a total of 10 to nine. This package is different from the other three packages in that it is the only one that does not recommend either self-haul only or commercial only facilities. It would provide for two transfer stations in the Northeast Lake Washington area in order to accommodate its projected population growth.

Two of the new full service facilities would be reconstructed at their current locations (Bow Lake and Factoria/Eastgate). Factoria/Eastgate can be constructed with no disruptions to self-haul or commercial customers. Bow Lake construction would not disrupt service for commercial customers. Self-haul customers would need to be temporarily rerouted to Renton and Algona. The remaining two facilities, South King County and Northeast Lake Washington, would require siting at a new, as yet undetermined location within each geographic area. Until all four facilities are fully constructed, the Algona, Renton, and Houghton stations would remain open as full service facilities.

Package 1 provides for a system where all waste is compacted, resulting in the lowest waste export cost. In addition, Package 1 is the only package that meets the level of service criteria detailed in Reports 1 and 2, and recommends closure of two facilities that are overstressed and have significant local impacts (Algona and Houghton, see Appendix H).

Package 1A

| Full Service Facilities | Self-Haul Only | Commercial Only | Closed |
|--|----------------|-----------------|------------------------------|
| New South County (new location) New Bow Lake (existing site) New Factoria (existing site) New NE Lake WA (new location) | None | None | Algona Renton Houghton |

Package 1A would provide for the construction of four new full service transfer facilities and the closure of three existing facilities. The total number of transfer facilities in the King County system would be reduced by one – from a total of 10 to nine. Like Package 1, this package does not recommend either self-haul only or commercial only facilities. It would provide for two transfer stations in the Northeast Lake Washington area in order to accommodate its projected population growth.

Redevelopment of the existing Factoria site would have significant impacts to environmentally sensitive areas. The 1993 Factoria Transfer Station EIS identified significant, unavoidable adverse impacts. Costs cannot be determined for this package because it is unknown whether or not these impacts can be mitigated. Until mitigation measures are identified, it is not certain what level of service could be achieved at the Factoria site. Tonnage and vehicle capacity cannot be determined without more specific information. It is also not possible to determine the costs associated with reconstruction of the site until mitigation measures are known. Operating costs are assumed to be the same at Factoria and Eastgate. Discussion is ongoing with the host city regarding the feasibility of this package with respect to the Factoria site.

Two of the new full service facilities would be reconstructed at their current locations (Bow Lake and Factoria). Factoria construction would disrupt self-haul and commercial customers requiring they be rerouted to Renton and Houghton. Bow Lake construction would not disrupt service for commercial customers. Self-haul customers would need to be temporarily rerouted to Renton and Algona. The remaining two facilities, South King County and Northeast Lake Washington, would require siting at a new, as yet undetermined location within each geographic area. Until all four facilities are fully constructed, the Algona, Renton, and Houghton stations would remain open as full service facilities.

The major distinction of Package 1A is that a facility would not be built at the Eastgate site. The reconstructed Factoria site would serve both commercial and self-haul customers. Like package 1, it recommends closure of two facilities that are overstressed and have significant local impacts (Algona and Houghton).

Package 2

| Full Service Facilities | Self-Haul Only | Commercial Only | Closed |
|--|--------------------------|-------------------------------|------------------|
| New South County (new location) New Bow Lake (existing site) New Factoria/Eastgate (existing site) | Houghton (existing site) | New NE Lake WA (new location) | Algona Renton |

Package 2 would provide for the construction of three new full service transfer facilities and one new commercial only facility. It would also keep Houghton open as a self-haul only facility and close Algona and Renton. This package would provide for three transfer stations in the Northeast Lake Washington area – one full service, one commercial only and one self-haul only. The total number of transfer facilities in the King County system would remain at 10.

With the exception of Houghton, Package 2 facilities would meet all level of service criteria identified in Table 2-1. Houghton would not meet the following criteria: vehicle capacity, space for three days storage, ability to meet recycling services policy goals, and the requirement for a 100 foot buffer and compatibility with surrounding land use. While some safety goals would not be met, eliminating commercial traffic would reduce the most serious of the safety concerns. (See Appendix H.)

Two of the new full service facilities would be reconstructed at their current locations (Bow Lake and Factoria/Eastgate). Factoria/Eastgate can be constructed with no disruptions to self-haul or commercial customers. Bow Lake construction would not disrupt service for commercial customers. Self-haul customers would need to be temporarily rerouted to Renton and Algona. The remaining two facilities, South King County (full-service) and Northeast Lake Washington (commercial only), would require siting at a new, as yet undetermined, location within each geographic area. Until all four facilities are fully constructed the Algona, Renton, and Houghton stations would remain open as full service facilities.

Package 2A

| Full Service Facilities | Self-Haul Only | Commercial Only | Closed |
|---------------------------------------|--------------------------|-------------------------------|--------|
| New South County (new location) | Houghton (existing site) | New NE Lake WA (new location) | Algona |
| New Factoria/Eastgate (existing site) | Renton (existing site) | New Bow Lake (existing site) | |

Package 2A provides for the construction of two new full service transfer facilities and two new commercial only facilities. It also keeps Houghton and Renton open as self-haul only facilities and closes Algona. This package provides for three transfer stations in the Northeast Lake Washington area – one full service, one commercial only and one self-haul only. The total number of transfer facilities in the King County system would increase by one to 11.

With the exception of Houghton and Renton, Package 2A facilities meet all level of service criteria identified in Table 2-1. Houghton would not meet the vehicle capacity criterion and the requirement for a 100 foot buffer and compatibility with surrounding land use. Houghton and Renton would not meet the following criteria: space for three days storage and ability to meet recycling services policy goals. While some safety goals would not be met, eliminating commercial traffic would reduce the most serious of the safety concerns. (See Appendix H.)

Two of the new facilities would be reconstructed at their current locations (Bow Lake and Factoria/Eastgate). Factoria/Eastgate can be constructed with no disruptions to self-haul or commercial customers. Bow Lake construction would not disrupt service for commercial customers. Self-haul customers would need to be rerouted to Renton and Algona. The remaining two facilities, South King County (full-service) and Northeast Lake Washington (commercial only), will require siting at a new, as yet undetermined, location within each geographic area. Until all four facilities are fully constructed the Algona, Renton, and Houghton stations will remain open as full service facilities.

Package 3

| Full Service Facilities | Self-Haul Only | Commercial Only | Closed |
|---|--|-----------------|--------|
| New South County (new location) New Bow Lake (existing site) New NE Lake WA* (new location) | Renton (existing site) Houghton (existing site) Factoria (no Eastgate) (existing site) | None | Algona |

*This station would process all commercial tonnage for Northeast Lake Washington

Package 3 would provide for the construction of three new full service transfer facilities. It would also keep Factoria, Houghton, and Renton open as self-haul only facilities and close Algona. Package 3 would provide for three transfer stations in the Northeast Lake Washington area: one mega full service and two self-haul only stations. The mega facility would be built to handle all of the commercial tonnage that now goes to both Factoria and Houghton. The total number of transfer facilities in the King County system would increase by one to 11.

With the exception of Factoria, Houghton and Renton, Package 3 facilities would meet all level of service criteria identified in Table 2-1. Factoria, Houghton and Renton would still not meet the following criteria: space for three days' storage and ability to meet recycling services policy goals. In all cases, eliminating commercial traffic would reduce the most serious of the safety concerns, though some safety goals would not be met. In all cases, the self-haul stations would not have the ability to compact waste. Factoria would still not meet the following criteria: vehicle capacity, compatibility with surrounding land use, and goals for traffic on local streets. In addition, the Factoria facility would require a new roof to meet seismic standards. Houghton would still not meet the following criteria: 100 foot buffer, vehicle capacity, and compatibility with surrounding land use (See Appendix H).

The major distinction of Package 3 is that a facility would not be built at the Eastgate site. Instead, a new Northeast Lake Washington "mega" facility would be built. This package assumes the sale of the Eastgate property currently owned by the Solid Waste Division as an offset to the capital cost of this package. The construction of Bow Lake would not disrupt service for commercial customers. Self-haul customers would need to be temporarily rerouted to Renton and Algona. The remaining two facilities, South King County (full-service) and Northeast Lake Washington (mega full service), would require siting at a new, as yet undetermined, location within each geographic area. The Algona facility would remain open as a full service facility until construction of the South King County facility is complete.

Reducing the number of facilities serving commercial customers to only one in the Northeast Lake Washington area could significantly impact garbage collection costs for this area.

Siting a facility to serve the entire Northeast Lake Washington commercial capacity may be more difficult than siting two smaller facilities because the local impacts of increased traffic and extended hours of operation would be greater. Scheduling for this package would depend upon the siting and construction of the mega full service station at a new site. Only after this facility was completed could the other station upgrades begin.

Package 4

| Full Service Facilities | Self-Haul Only | Commercial Only | Closed |
|---------------------------------------|--|--|--------|
| New Factoria/Eastgate (existing site) | Algona (existing site) Renton (existing site) Houghton (existing site) | New South County (new location) New Bow Lake (existing site) New NE Lake WA (new location) | None |

Package 4 would provide for the construction of one new full service facility and three new commercial only transfer facilities. It would also keep Algona, Houghton, and Renton open as self-haul only facilities. Package 4 would provide for three transfer stations in the Northeast Lake Washington area – one full service, one commercial only service and one self-haul only. The total number of transfer facilities in the King County system would increase by two for a total of 12.

With the exception of Algona, Houghton and Renton, Package 4 facilities would meet all level of service criteria identified in Table 2-1. In all three self-haul stations, eliminating commercial traffic would reduce the most serious of the safety concerns, though some safety goals would not be met. In all cases, the self-haul stations would not have the ability to compact waste. For all three self-haul stations, the following criteria would still not be met: space for three days' storage and ability to meet recycling policy goals. Algona would still not meet the following criteria: vehicle capacity and traffic goals on local streets. Houghton would still not meet the following criteria: 100 foot buffer and compatibility with surrounding land use. (See Appendix H.)

The major distinctions of Package 4 are in all but one instance, stations would be single purpose – either commercial only or self-haul only; there are no proposed station closures in this package; Bow Lake is designated as a commercial only facility; and Algona would be converted to a self-haul facility (as opposed to complete closure). The construction of Bow Lake would mean no service disruption for commercial customers; however, self-haul customers would need to be permanently directed to the Renton facility. Eastgate would be the only new full service station to be constructed. The South County and Northeast Lake Washington facilities would be commercial only. As in all packages, the Northeast Lake Washington and the South King County stations would require siting at a new, as yet undetermined location within each geographic area. The Algona, Houghton and Renton facilities would remain open as self-haul only facilities.

Cost Information

In order to evaluate costs, the division developed a model using the following inputs. See Appendix I.

- tonnage forecast by facility by year
- costs to site, design and construct facilities by facility type
- schedule for capital projects
- operating costs, short haul costs and configurations for different facility types
- financing/debt service assumptions (discount and interest rates)

Tonnage Forecast

The division developed an econometric model using various demographic and income data to forecast the future amount of waste to be disposed (referred to as the “baseline tonnage forecast and included in Appendix C). It was then necessary to allocate this baseline tonnage forecast among the facilities included in each of the packages.

Package 1:

This package includes the construction of four new full service facilities and the closure of the Renton, Houghton and Algona facilities. The baseline forecast was allocated as follows:

| <u>Source</u> | <u>Destination</u> |
|---------------|---------------------------|
| Algona | new South County |
| Bow Lake | Bow Lake |
| Factoria | Factoria/Eastgate |
| Houghton | Northeast Lake Washington |
| Renton | Bow Lake |

Package 1A:

Until mitigation measures are identified, the division cannot forecast the reallocation of tonnage that would be necessary under this package.

Package 2:

This package keeps self haul at Houghton, builds three new full service facilities, builds a commercial only facility at a new Northeast Lake Washington site, and closes both the Renton and Algona facilities. The baseline forecast was allocated as follows:

| <u>Source</u> | <u>Destination</u> |
|-----------------------|---------------------------|
| Algona | new South County |
| Bow Lake | Bow Lake |
| Factoria | Factoria/Eastgate |
| Houghton’s commercial | Northeast Lake Washington |
| Houghton’s self-haul | stays at Houghton |
| Renton | Bow Lake |

Package 2A:

This package keeps self haul service at Houghton and Renton, builds two new full service facilities, builds two new commercial only facilities, and closes the Algona facility. The baseline forecast was allocated as follows:

| <u>Source</u> | <u>Destination</u> |
|-----------------------|---------------------------|
| Algona | new South County |
| Bow Lake's self-haul | Renton |
| Bow Lake's commercial | stays at Bow Lake |
| Factoria | Factoria/Eastgate |
| Houghton's commercial | Northeast Lake Washington |
| Houghton's self-haul | stays at Houghton |
| Renton's self-haul | stays at Renton |
| Renton's commercial | Bow Lake |

Package 3:

This package includes the sale of the Eastgate property and building one “mega” full service facility located in the Northeast Lake Washington area that would address the areas currently served by Houghton and Factoria. It also includes a new facility at Bow Lake and at a new location in South County. Houghton, Renton and Factoria would be self haul only. In this case, the baseline forecast was reallocated as follows:

| <u>Source</u> | <u>Destination</u> |
|-----------------------|--------------------|
| Algona | new South County |
| Bow Lake | Bow Lake |
| Factoria’s commercial | Mega Facility |
| Factoria’s self-haul | stays at Factoria* |
| Houghton’s commercial | Mega Facility |
| Houghton’s self-haul | stays at Houghton* |
| Renton’s commercial | Bow Lake |
| Renton’s self-haul | stays at Renton |

* Approximately 5% of the self haul tonnage generated at both facilities was assumed to go to the mega facility

Package 4:

This package includes: three commercial only facilities - Bow Lake, South County and Northeast Lake Washington; three self haul only facilities - Houghton, Renton, and Algona; and, one full service facility at Factoria/Eastgate. The baseline tonnage forecast was allocated as follows:

| <u>Source</u> | <u>Destination</u> |
|----------------------------|---------------------------|
| Algona’s self haul | stays at Algona |
| Algona’s commercial | new South County |
| Bow Lake’s self haul | Renton |
| Bow Lake commercial | stays at Bow Lake |
| Factoria | Factoria/Eastgate |
| Houghton’s commercial | Northeast Lake Washington |
| Houghton’s self-haul | stays at Houghton |
| Renton’s commercial | Bow Lake |
| Renton’s self-haul tonnage | stays at Renton |

Costs to Site, Design and Construct Facilities by Facility Type

Capital costs used in the analysis were based on engineering estimates from Solid Waste Division engineers and consulting engineers from RW Beck and KPG Inc. Each independently developed cost estimates for full service and commercial only facilities. Estimates to construct new self haul facilities were not generated because none of the four packages proposes building one. Instead the various proposals use existing transfer stations as self haul only facilities. The analysis assumes no capital improvements for the existing self haul only facilities other than building a new roof at Factoria and a retaining wall at Algona. Houghton is currently budgeted to receive a new roof as well as safety and mitigation improvements.

The three groups of engineers based their estimates on their own engineering experience on past projects, an analysis of similar facilities regionally and nationally, a review of SWANA design criteria, property cost estimates from county property services, and their own property appraisal experiences. The most critical assumptions used in developing the cost estimates were facility type, square footage of proposed building and schedule for completion.

The assumptions for each are listed below.

| Facility Type | Square Footage of Building | Schedule for Completion * | Size |
|---------------|----------------------------|---------------------------|----------|
| Full Service | 50,000 | 8.5 years | 20 Acres |
| Commercial | 30,000 | 6.5 years | 10 Acres |

* Includes siting, design and construction

The three groups of engineers then went through a reconciliation process to come up with the best cost estimates for new full service and commercial only facilities. The commercial only facilities cost less to site, design and construct than full service facilities. This is due mainly to reduced traffic levels characteristic of commercial only sites, and the smaller queuing space and therefore smaller piece of property that is required. These lower traffic levels at commercial sites may make siting such facilities easier than their full service counterparts. With a commercial only facility, traffic would be much lighter on the weekdays, with limited hours on weekends. Commercial only sites can also have smaller transfer buildings due to the need for fewer stalls to dump as waste is brought in fewer, larger loads.

Full service facilities have the longest timeline from design to completion since they have the greatest siting challenges. A full service facility needs more space and needs to be in a location that can absorb 400 to 600 vehicle trips per day. The site must be large enough to maintain separation between commercial and the passenger vehicles as well as the small trucks used by self haulers. This separation of different types of vehicles is important in the driving lanes, at the scalehouse, and especially on the tipping floor. Such a design element is vital for safety purposes and to ensure that the commercial haulers can get in and out of the station as efficiently and quickly as possible.

Schedule for Capital Projects

Each package of construction projects has its own set of tasks that have been scheduled out into the future. The work at each station has been divided into the five categories listed below, which are anticipated to be done sequentially over the duration of each buildout:

- Siting
- Land Acquisition
- Land Use Permitting including environmental review
- Design/Building Permits
- Construction / Equipment

All six packages can be completed by the time Cedar Hills is expected to reach its current permitted capacity in 2015. Anything that can be done to reduce the time it takes to site, permit and construct these facilities could save millions of dollars to the solid waste ratepayers.

For the packages that involve siting and building new transfer stations, the division plans to undertake these projects simultaneously wherever possible, in an effort to expedite their completion and save money. In particular, the plans for completing the new Northeast Lake Washington, South King County and Factoria/Eastgate projects assume parallel siting and construction schedules, as these efforts would not involve closing or interrupting any existing waste transfer operations.

It is currently expected that for each of the six packages all facilities could be complete and operational by 2015 if the siting process is begun by 2007.

Operating Costs by Facility Type

Operating costs for the packages need to be considered because there are tradeoffs between capital and operating costs for each one. In order to get a complete picture of the relative financial impacts of the packages, both capital and operating costs have to be considered over the course of the facilities' useful lives.

Staffing costs were used as a proxy for operating costs because personnel comprise the vast majority of these expenses. Staffing costs are also the main expenses that fluctuate with the type of facility, i.e. self haul, full service, commercial only. Commercial only facilities need less staff because all of its customers are experienced in the use of the facilities. Self haulers need far more direction and oversight from transfer station personnel to use the facility safely.

The analysis also considered the tonnage levels and operating hours for the different facilities, i.e. the number of shifts worked per week. For each package an assumption was made the current level of service would be provided for commercial haulers. Currently that is 24 hours per day at Bow Lake and 17 hours per day at Factoria.

Other facility operating costs, including utilities and site maintenance, do not vary significantly between facilities. These additional operating costs were not part of the

analysis since their inclusion would not serve the purpose of differentiating the packages from one another.

The staffing costs used in the analysis are based on current King County wage rates and contract provisions, inflated from 2005 levels for future years.

Financing/Debt Service Assumptions

The financial analysis of each package involved several steps:

1. Estimating the relevant capital costs and construction schedules – which in some cases extend out eight years into the future.
2. Projecting inflation-adjusted costs and determining the quantity and timing of any bond financing required.
3. Calculating the cost savings expected from the use of modern compactors, and converting those cost savings to a present value to reflect the full lifecycle of benefits available from the compactor. The reduction in transportation costs that can be achieved by these compactors can, in effect, offset the capital costs of a transfer station by 20% to 30%. In any case, under current market conditions, it is assumed that financing the new stations would involve sale of general obligation bonds with a 4.25% interest rate. For determining present values a discount rate of 5% is used.
4. Considering the bond amortization costs, as well as the cost savings from the compactors, into the financial planning model helps the division determine if and when rates need to be increased.

The financial analysis of the transfer station packages shows that any of the six alternatives could be financed and constructed within the structure of the current and future rate commitment that the division established, i.e. per ton tipping fees will not increase by more than the rate of inflation, using 1999 as a base year (the last time rates were changed).

The division recognizes that under all scenarios, transfer stations will continue to be utilized in processing solid waste in King County. It is also clear that the current system has been operating for roughly 50 years and no significant new capacity has been added since the mid 1970's. Operating this inefficient system requires additional effort by staff and management to ensure that facilities are operated safely.

Upgrading the transfer system will significantly improve current operations from a cost, risk and customer service perspective. It will also facilitate an efficient transition to waste export.

Cost Summary

Costs calculated through 2028, the term of the ILA's, are included in Table 2-4. As Table 2-4 shows, the cost differences through 2028 are minimal among the packages. There is a

trade-off between capital costs and operating costs depending on the types of facility (commercial only, self haul only, or full service) and the number of facilities in the system.

For instance, even though Package 1 has the fewest facilities, the capital costs are higher because all are new, full service facilities. Full service facilities require more land and larger buildings to serve all self-haul and commercial customers' disposal and recycling needs. While capital costs of Package 1 are the highest among the four packages, operating costs are lowest because there are fewer facilities and therefore lower staff and other operating costs. In addition, Package 1 provides a system where all waste is compacted resulting in the most cost-effective long haul disposal rates.

In contrast, even though Package 4 has the most facilities it has the lowest capital costs for several reasons. First, Package 4 retains three largely unimproved existing stations as self haul only facilities. The three facilities (Renton, Algona and Houghton) do not and will not meet the level of service criteria defined in Report 1. In addition, three of the new facilities are proposed to be commercial only. Commercial only facilities require less land and smaller buildings than full service facilities, which reduces capital costs. However, the operating costs of Package 4 are higher than Package 1 due to the higher number of facilities.

Total annual costs for Packages 2 and 3 fall between Packages 1 and 4 (see Table 2-4 below). But as noted earlier, cost is not the primary factor that differentiates these packages. Complete cost data is not available for Package 1A.

Table 2-4. Package Cost Information Through 2028

| Pkg. | Total CIP Cost of Package ⁽¹⁾ (2005 dollars) | Present Value of Net Capital Cost ⁽²⁾ | Average Annual Net Capital Cost (2006-2028) | Annual Operating Cost for Package (2005 dollars) | Sum of Annual Net Capital Cost and Staffing |
|------|--|--|---|--|---|
| 1 | \$197,400,000 | \$120,500,000 | \$5,200,000 | \$4,300,000 | \$9,500,000 |
| 1A | No cost data – see package description* | No cost data – see package description* | No cost data – see package description* | \$4,300,000 | No cost data – see package description* |
| 2 | \$181,300,000 | \$108,000,000 | \$4,700,000 | \$4,700,000 | \$9,400,000 |
| 2A | \$169,900,000 | \$102,000,000 | \$4,500,000 | \$4,800,000 | \$9,300,000 |
| 3 | \$157,800,000 | \$ 88,900,000 | \$3,900,000 | \$5,200,000 | \$9,100,000 |
| 4 | \$154,900,000 | \$ 90,700,000 | \$3,900,000 | \$5,200,000 | \$9,100,000 |

(1) For the purposes of this analysis, minimal capital investments were added for self-haul only options, which will leave the stations largely as is at the time of waste export. The exceptions to this are the Factoria and Algona stations. A new roof would need to be added to Factoria and a retaining wall is needed at Algona. It is important to note that long-term use of these stations may require capital investments to address specific structural and site issues since the facilities will be at least 50 years old in 2015.

(2) Net capital cost = debt service - lifecycle savings generated by compaction

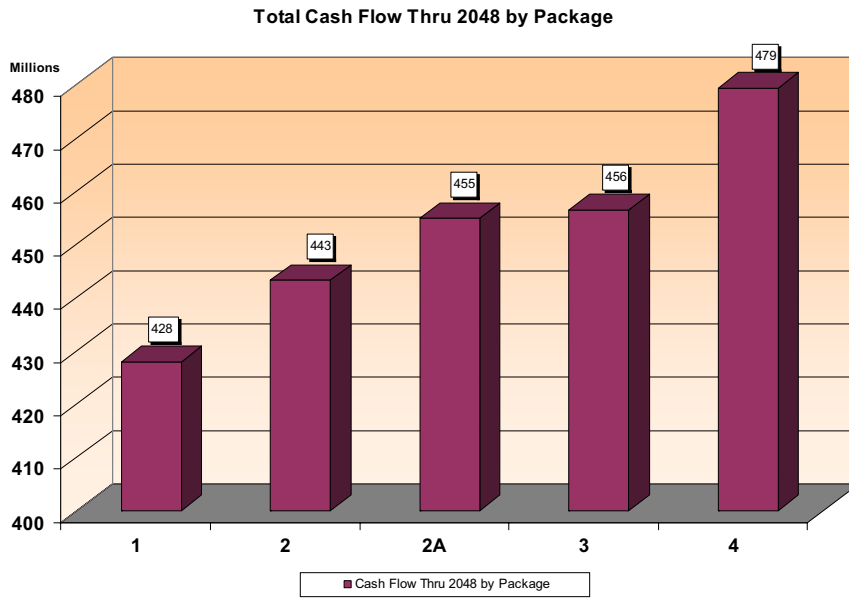
** Redevelopment of the existing Factoria site would have significant adverse impacts to environmentally sensitive areas, as identified in the 1993 Factoria Transfer Station EIS. Until mitigation measures are identified, it is not possible to determine the costs associated with reconstruction of the site. Operating costs are assumed to be the same at Factoria and Eastgate. Discussion is ongoing with the host city regarding the feasibility of this package with respect to the Factoria site.*

The Longer Term Outlook

To help examine the financial implications of the five transfer station packages over the longer term, the cost for each was projected out to the year 2048 (Appendix J provides more detail on this analysis). It is likely that any facility built in the future will continue to operate through this time period.

The capital-plus-operating costs of the alternatives, under the assumption of a 3% rate of inflation, are summarized here. Note that labor costs are used as a proxy for operating costs. Figure 2-3 shows total capital and operating expenditures through 2048.

Figure 2-3. Total Cash Flow Through 2048 by Package

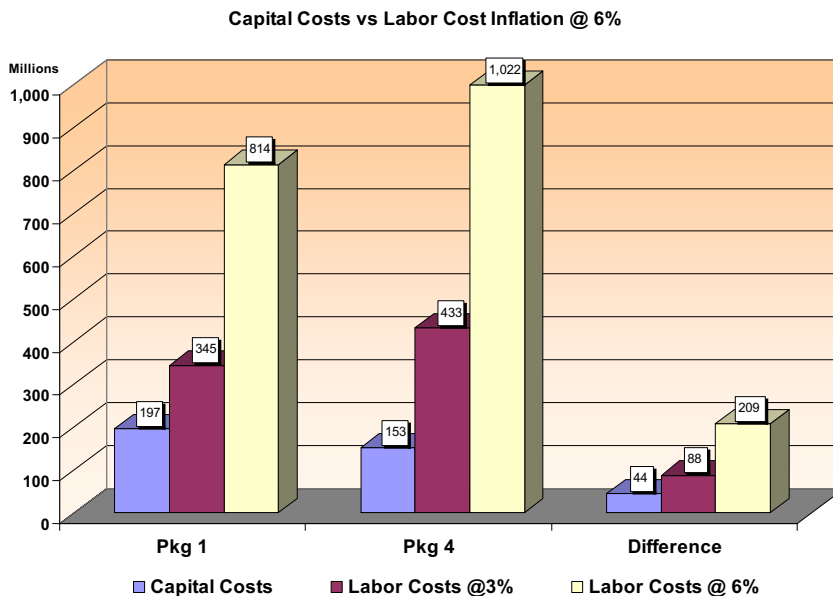


Package 1 has a greater initial capital investment than the others. This is offset over the long term by lower operating costs. On the other hand, Package 4 has four more facilities to staff since it has separate commercial and self-haul facilities. As a result, the operating costs of Package 4 are higher over the long term. Additionally, short and long haul costs in Package 4 are higher since about 16% of the waste stream (generated at self-haul only facilities) would not be compacted prior to export.

Since Packages 1 and 4 are respectively the most and least capital intensive it is interesting to compare how they respond to different rates of inflation. The following chart compares the operating costs for the two packages, with inflation at 3%, 5% and 6% over the years 2006 through 2048. Package 4 is most sensitive to inflation because of the higher staffing levels and transport costs.

Figure 2-4 shows the capital versus operating cost comparisons under the various rates of inflation. Package 1 requires about \$44 million more in initial capital spending than Package 4, but even with only a 3% annual inflation in labor costs, this option “saves” \$88 million compared to Package 4. Under a more severe inflation assumption the advantage of Package 1 increases to a projected \$209 million.

Figure 2-4. Capital Costs Versus Operating Cost Inflation



Appendix J explores these issues in greater detail. The policy issue is a choice between the risk exposure from unknown variable costs over a longer term versus investing a known amount of additional capital up front.

Effect of Transfer System Packages on Disposal Rates

Some years ago the Executive made a commitment that the rate of increase in the Cedar Hills disposal fee would remain below the rate of inflation. In Figure 2-5 the blue line represents the progress of inflation, starting in the year 2000. The red line shows the historical tipping fee through 2005, and current projections to the year 2022. The rate commitment ends with the closure of Cedar Hills reflected by the red line moving above the blue line after 2015.

The rate scenario depicted by the red line incorporates the costs of building and operating transfer station Package 1, which is the most costly of the alternatives. The rate increase shown for 2008, up to \$96.00, would be the first adjustment since 1999. In addition to helping catch up with general cost increases it would also cover the increase in debt service

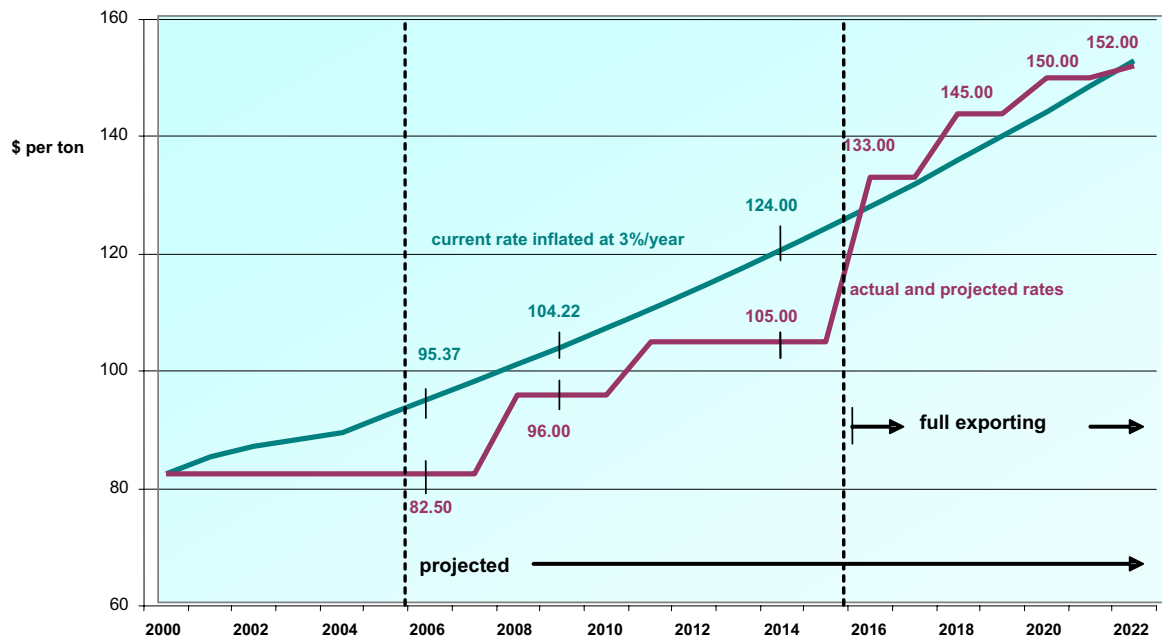
that would be part of implementing Package 1, assuming the use of 20-year bonds, issued at a rate of 4.5%.

Despite these new costs, the division expects the tipping fee to remain well within the inflation limit, even while projecting a five year flat rate of \$105.00 starting in year 2011, which would partly be made possible through the cost savings generated by compactors in several of the new or remodeled transfer stations.

However, under current plans, total exporting will begin at the end of 2015, and the tipping fee that would be required to support this activity is currently projected to be outside the projected inflation ceiling.

Compared to the current situation, the post Cedar Hills environment may involve substantially less control over the division's costs, and the resulting rates it is able to set. In this context, the merit of investing to expand the capacity of the Cedar Hills Regional Landfill acquires an additional attractiveness.

Figure 2-5. Rate Commitment and Projections – Transfer Station Package 1



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CHAPTER 3. PUBLIC-PRIVATE OPTIONS

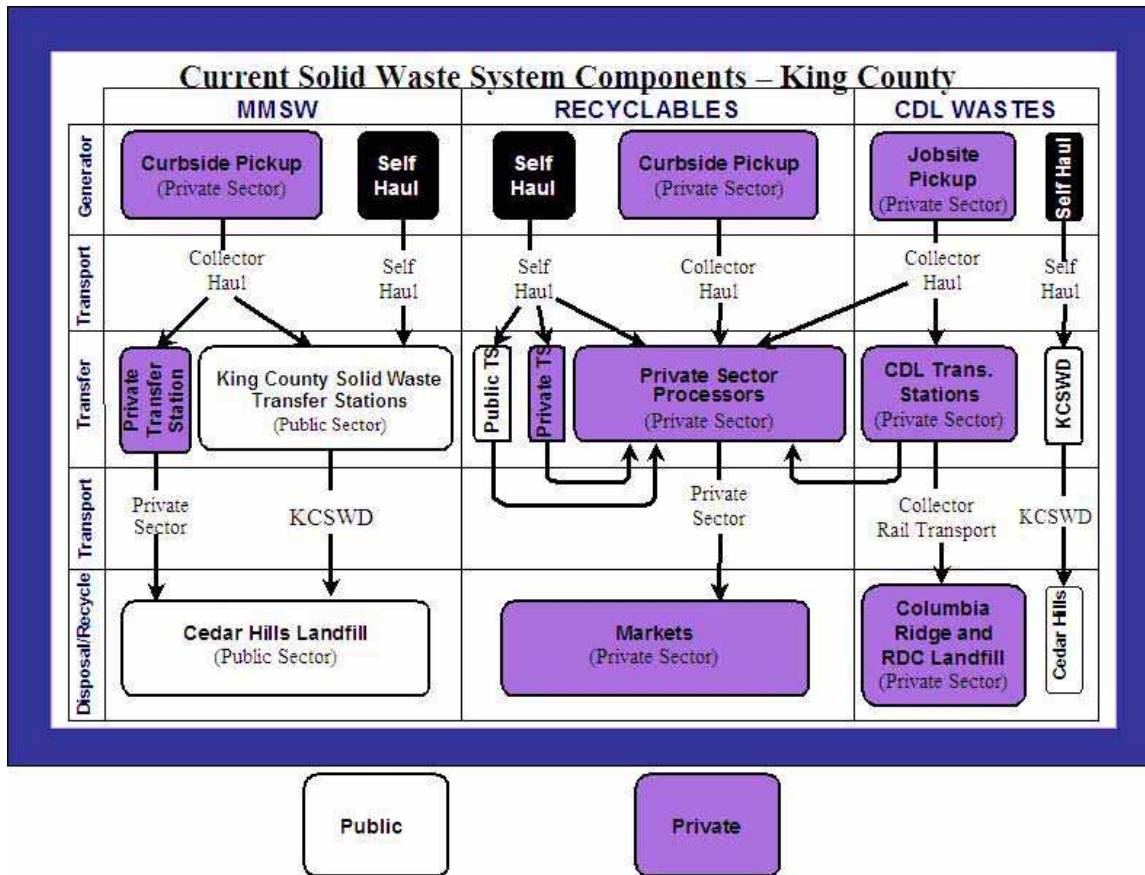
Chapter Synopsis

This chapter provides a summary of three public/private options for ownership/operation of transfer facilities. Presented in this chapter is a summary regarding the public-private mixes in solid waste systems of several other jurisdictions in Washington. This chapter presents several policy issues that will need to be considered when deciding upon the configuration of the future system. State law, case law and collective bargaining agreements frame the discussion policy makers will have in considering these options.

Background

The current solid waste system is a mixture of publicly and privately provided services (see Figure 3-1). Collection, processing, and final disposal of construction and demolition waste and recyclable materials are all privatized services. Through contracts with cities and Washington Utilities and Transportation Commission (WUTC) franchises, the private sector is also primarily responsible for waste collection. Through interlocal agreements between King County and 37 cities that expire in 2028, the Solid Waste Division is responsible for operation of the public transfer stations and the regional landfill, as well as the development of the state mandated comprehensive solid waste management plan that establishes policies for transfer, disposal, and waste reduction and recycling. Given that disposal services will be privately provided once King County moves to waste export, the only remaining system functions to consider for privatization will be transfer and intermodal services.

Figure 3-1. Current Solid Waste System Components



The county council has determined that after Cedar Hills Regional Landfill reaches permitted capacity and closes, the county will not build or operate another landfill. Therefore, disposal will become privatized at the time of waste export. This chapter examines the options for public and private ownership and operation of the solid waste system, which at the time of waste export will include transfer stations and at least one intermodal facility.

Three Options

The third milestone report identified three options for the ownership and operation of the transfer and intermodal facilities that will comprise King County's solid waste export system. These are:

1. Public-only,
2. Public-private partnership, and
3. Private-only.

Analysis of Options

Public-Only:

State law (RCW 70.95.020) mandates public oversight and authority for the planning and handling of solid waste. This precludes the possibility of a purely private solid waste system with no public sector involvement. Within the framework of state law, the public-only option has no legal, regulatory, or labor obstacles.

Public-Private Partnership:

Public-private solid waste systems can take a variety of forms. Table 3-1 summarizes the mixed systems currently operating in Washington State.

This option for the solid waste system must be procured by the public sector through contracts with the private sector. Contract agreements for services could include ownership or lease and operation of transfer and intermodal facilities. Depending on how the system is divided between the public and private sectors, labor issues may pose obstacles to this option. However, such obstacles may not be prohibitive. Per RCW 36.58.090:

Notwithstanding the provisions of any county charter or any law to the contrary, and in addition to any other authority provided by law, the legislative authority of a county may contract with one or more vendors for one or more of the design, construction, or operation of, or other service related to, the solid waste handling systems, plants, sites, or other facilities in accordance with the procedures set forth in this section.

There is historical precedent for a mixture of public and private transfer stations in King County. Currently less than 1% of municipal solid waste in the King County system passes through private transfer stations. In the past, up to 40% of the county's municipal solid waste has passed through private transfer stations, and construction, demolition and landclearing waste is currently handled by the private sector through contracts with King County. In meetings held with representatives of Waste Management, Allied/Rabanco, and Waste Connections all agreed that they preferred either an all public or all private transfer system. A mixed transfer system was viewed by the haulers as not being the most efficient system.

There is an existing King County Council labor policy which says that when the county is contemplating contracting out work done by county employees, the employees will be given a chance to bid on providing the service. In addition, in contracts between King County and the Teamsters Locals 117P and 174, International Federation of Professional and Technical Employees Local 17A and International Union of Operating Engineers Local 302, the county has agreed that no jobs will be eliminated due to contracting out, and that work currently performed by members of the bargaining units will not be contracted out.

Private-Only:

A private-only system where the public sector is not involved in service delivery, rate setting or long term planning, is not allowed under current state law (RCW 70.95.020), or county policy. A privatized system would involve contracting out work that has historically been done by the public sector, and faces significant legal obstacles. Courts have found where public employees have customarily and historically performed a service, civil service

principles require that civil servants provide the service when new need arises, unless they are unable to provide the service.¹

The issue is not whether employees are unionized or not -- it is whether they are civil service or private sector employees. Both public and private sector solid waste employees in King County are unionized and are represented by the Teamsters union. Even if it were less expensive, potential cost savings from the use of private entities was not found to be sufficient reason for civil servants not to provide the service. In a MWSMAC meeting attended by the haulers on December 19, 2005, all haulers agreed that if required to use the same standards for siting and construction of facilities as King County, there would be no significant difference in costs.

Washington State collective bargaining law, RCW 41.56, generally requires that an employer bargain over the contracting out of bargaining unit work. Whether the employer has to bargain over the decision to contract out is determined by a balancing test between the core entrepreneurial interest of the employer and the interest of the employees. Even where an employer is not required to bargain over the decision to contract out, the employer is still required to bargain with the union over the effects of contracting out.²

Privatization might be considered analogous to a scenario of going out of business, in which case contracting out could be permissible. To justify this action, the county would have to show cause for removing itself from the transfer business. Whether or not King County operates transfer stations, it still maintains planning authority for solid waste under state law and the interlocal agreements, and cannot be considered "out of the business."

¹ Joint Crafts Council and Teamsters Union Local 117 v. King County, 76 Wn. App. 18; 881 P.2d 1059 (1994)

² International Longshoremen's and Warehousemen's Union, Local 9 v. Port of Seattle, Decision 1989 – PERB (1995)

Summary

The future solid waste system will continue to be a mix of public and private sector service provision. Once waste export is implemented, disposal will shift from the public to the private sector. Intermodal service, since it will be a new element in the King County solid waste system, could be provided by either the public or private sector. On the other hand, who provides waste transfer services is not black and white. The legal, policy and contractual issues described above present obstacles that may or may not be insurmountable. There is not clear guidance from the courts or state law on the permissibility of contracting out work that has traditionally been done by both the public and the private sectors, as is the case in King County.

The configuration of the future system is a decision that policy makers will need to make after assessing the risks and benefits of the alternatives. In summary, policy makers will need to consider:

- Case law interpreting the King County Charter and the King County Code relative to labor policy
- RCW 36.58.090 “Contracts with vendors for solid waste handling, plants, sites or facilities—Requirements—Vendor selection process”
- Civil service impediments to contracting out career service work
- Washington state collective bargaining law, RCW 41.56
- Contracting out clauses within King County labor agreements

The final Waste Export Plan will contain a recommendation on the preferred system configuration for moving to waste export, including a recommendation on the roles of the public and private sector.

Table 3-1. Public-Private Mixes in Solid Waste Systems in Washington State

| Agency | Planning | Collection | Transfer Stations, # and Ownership | Transfer Station Operation | Short-Haul (TS to Intermodal) | Intermodal Operation/ Ownership | Long-Haul | Disposal | Local Backup Landfill |
|---------------------|----------|---|---|---|--|---|-----------|---|---|
| King County | Public | Private and Public (City of Enumclaw and Town of Skykomish) | 8 Public (plus 2 rural drop box locations) | Public | Public (to landfill) | NA | NA | Public Landfill | No |
| City of Seattle | Public | Private | 2 Public 2 Private | Public for Public Private for Private | Public from Public Private from Private | Private-Private | Rail | Private Landfill | No |
| Snohomish County | Public | Private and Public | 3 Public | Public | Public | Private-Private | Rail | Private Landfill | No |
| Clark County | Public | Private | 2 Private (plus 1 under construction) | Private | Private (truck to barge) | Private-Private | Barge | Private Landfill | No (county is considering changing) |
| City of Spokane | Public | Private | 3 Public, including transfer station at waste-to-energy (WTE) facility | Public | Public (most waste to WTE; excess waste to intermodal) | Private-Private | Rail | Public-Private WTE Facility Local Public Landfill Remote Private Landfill | Local Public Remote Private |
| Thurston County | Public | Private and Public (City of Olympia) | 1 Public (plus 3 rural drop box locations) | Private (includes hauling from 3 rural sites to transfer station) | Private | Private-Private | Rail | Private Landfill | No (Finlay Buttes LF, OR is backup to Roosevelt LF) |
| Kitsap County | Public | Private and Public (City of Poulsbo) | 1 Public (DBOOT ² on public land) 1 Private, 5 drop boxes | Private | NA | Public (part of Transfer Station)-Private | Rail | Private Landfill | No |
| Grays Harbor County | Public | Private | 2 Public, 1 drop box | Public | Private | Private-Private | Rail | Private Landfill | No |
| Jefferson County | Public | Private | 1 Public | Public | Private (to private landfill) | NA | NA | Private Landfill | Yes |

Source: R. W. Beck, Technical Memorandum, October 18, 2005.

1. Excess waste beyond the capacity of the waste-to-energy (WTE) facility is trucked to an intermodal facility. Waste is bypassed during most months of the year, due to (1) seasonal fluctuations in waste volumes and (2) planned outages of the WTE for maintenance.
2. Facility developed under a design-build-own-operate-transfer (DBOOT) agreement, in which the county will buy the facility back from the private owner-operator after a certain period of time.

CHAPTER 4. ANALYSIS OF LANDFILL CAPACITY

Chapter Synopsis

This chapter explores options for extending the useful life of the Cedar Hills Regional Landfill, and discusses the possibility of preserving emergency backup capacity for King County and neighboring jurisdictions that have already moved to waste export. Also included in this chapter is a discussion of landfills in the western United States that are possible destinations for King County's exported solid waste.

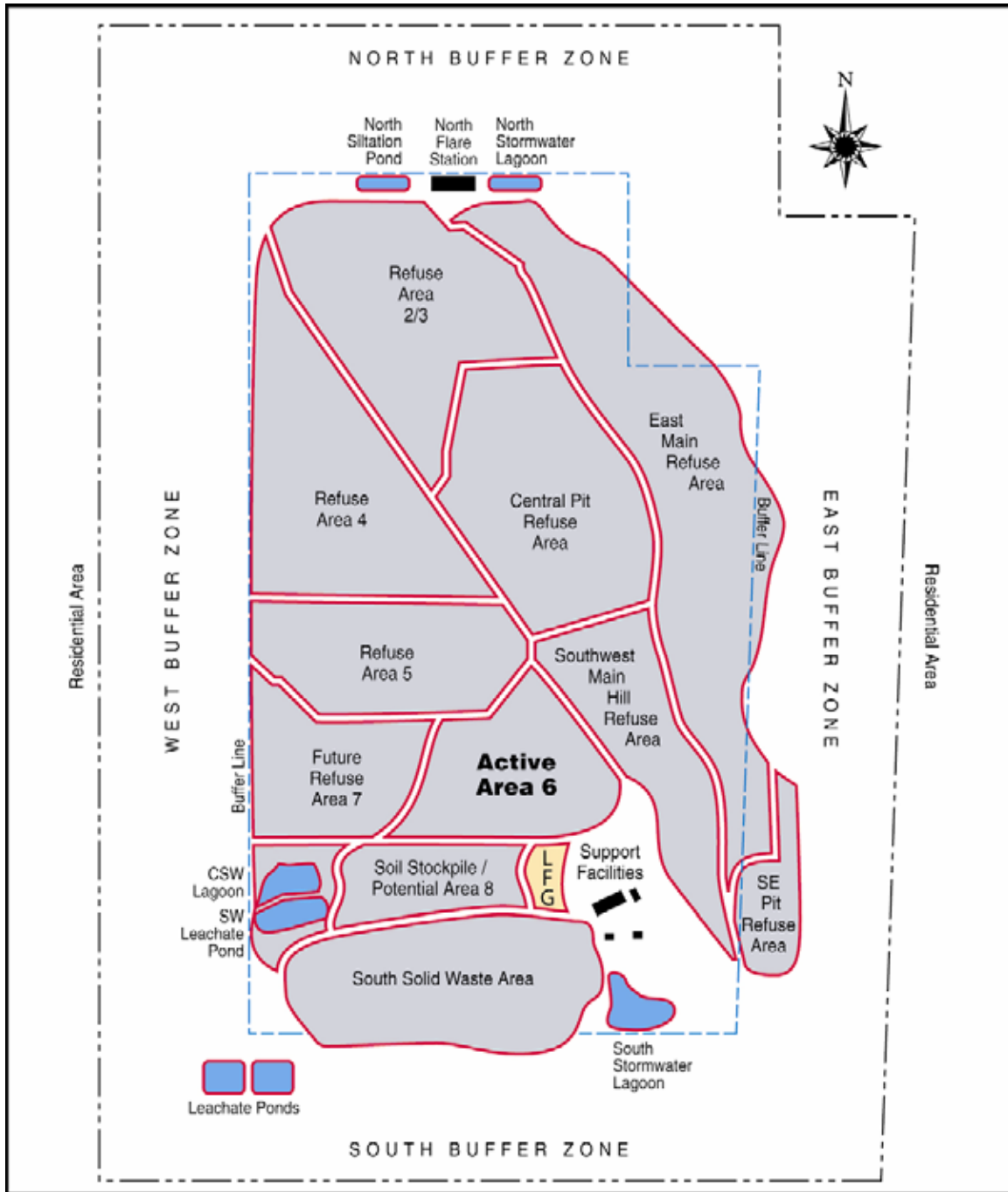
Under the current landfill development plan, the Cedar Hills Regional Landfill is expected to reach capacity in 2015. When Cedar Hills closes, the county's solid waste system needs access to a new MMSW disposal site.

Current Capacity

The calculated capacity of the landfill is the volume of space available based on height, footprint, and slopes, as defined in the *Cedar Hills Site Development Plan*. The capacity, or life, of the landfill is based on the amount of incoming solid waste and the density and consolidation of materials in the landfill over time. Both internal and external influences can affect overall landfill capacity.

The *2001 Final Comprehensive Solid Waste Management Plan* estimated that the Cedar Hills Regional Landfill would reach its permitted capacity in 2012. Based on incoming tonnage projections and the landfill density achieved to date (and expected in the future), it is currently estimated that the Cedar Hills Regional Landfill will reach its permitted capacity in late 2015, three years beyond earlier forecasts of 2012. This extension is possible within currently permitted constraints on the height and footprint of the site, and without encroaching upon the designated buffer zone, which is the area between the active solid waste handling area and the boundary of the site. See Figure 4-1, Layout of the Cedar Hills Regional Landfill.

Figure 4-1. Layout of the Cedar Hills Regional Landfill



Increased Capacity at Cedar Hills to Date

A number of factors have led to an increase in capacity:

1. Through natural settling of the landfill, less space is consumed; hence, the landfill is not filling at the rate previously projected. This is consistent with nationwide trends. See Appendix K.

2. A portion of the excavated areas for Areas 6 and 7 was reserved to stockpile soil for eventual daily cover. The division relocated the soil stockpile area to Area 8. This allows the entire excavated areas of 6 and 7 to be filled, increasing capacity. The stockpiling areas still do not encroach on the buffer zone. This change added one and one-half years of additional landfill capacity.
3. The division's method of building and maintaining refuse tipping floors on the landfill has improved since Area 5 was opened in 1999. The rock that is spread on the landfill face to create a driving surface is now dug up and reused the next day, instead of being left in place. This has added capacity, although it is difficult to calculate precisely how much.

Ongoing Efforts to Increase Capacity

New and expanded plans and programs will continue to increase Cedar Hills' lifespan:

1. Late in 2005 the division began using tarps as alternative daily cover rather than the previous daily application of six inches of compacted soil over the active fill area. The tarps are placed over a small portion of the active fill area at the close of daily operations and taken up at the next day's start of operations. Use of this alternative daily cover saves space and thereby extends the life of the landfill. Because the use of tarps is a pilot project that has only recently begun, the division is not yet able to calculate how much extra life this practice will add to the landfill.
2. Efforts to increase waste reduction and recycling would affect the tonnage received at Cedar Hills. Projections for this analysis are based on the tonnage forecasts using the current recycling rate of 41%.

Potential for Developing Additional Capacity

The division is currently operating in accordance with the Cedar Hills Development Plan, which includes the utilization of on-site soil in conjunction with alternative daily cover. No changes in current permit conditions are anticipated. Life remaining is through 2015. The following development scenarios present alternatives for the remainder of the life of the Cedar Hills Regional Landfill:

1. Regrade Areas 5, 6, and 7 to the permitted elevation when Area 7 is close to reaching capacity.

This alternative would use the projected airspace gained from the settlement of these refuse areas. This scenario includes only refuse areas that have bottom liners as required by current regulations. Final cover on these areas would be deferred until they reach permitted height. Changes in existing design criteria are not anticipated. This alternative is projected to add one year to the life of the landfill and would likely require modification of the existing operating permits.

2. Regrade Areas 2, 3, 4, and Central Pit to the permitted elevation.

This alternative would fully utilize existing airspace gained from past settlement of these refuse areas. This scenario considered only refuse areas that have bottom liners. But the bottom liners in these areas were installed under an earlier, less stringent set of regulations. This scenario may require addition of liners that are compliant with current regulations between the old cover and new garbage. Changes in existing design criteria are not anticipated. This alternative is projected to add up to two and one-half years to the life of the landfill and would require new construction and operating permits.

3. Develop Area 8.

Area 8 is currently used for stockpiling soil. This alternative would fully utilize the existing soil stockpile area for landfill development, which would include:

- Maximization of alternative daily cover use,
- Some importation of soil,
- Acquisition and operation of an offsite source for soil,
- Stockpiling soil over closed refuse areas, or
- A combination of all four actions.

This alternative is projected to add up to two and one-half years to the life of the landfill. This alternative would require new operating permits and environmental review, which could involve preparation of a Supplemental Environmental Impact Statement.

Each scenario described above involves costs and presumes landfill development and operating plan modifications will be approved by regulatory authorities. Offsetting these costs, however are the savings realized by extending the life of Cedar Hills and delaying the move to waste export. The cost benefits of the above alternatives, in different combinations, are presented in Table 4-1.

Table 4-1. Regrade/Development Alternatives Cost Savings

| Scenario | Description | Lifecycle Present Value of savings per ton | Lifecycle Present Value of savings |
|---|----------------------|--|------------------------------------|
| Regrade areas 5, 6, & 7 | Operate through 2016 | \$0.48 | \$ 14,000,000 |
| Regrade areas 5, 6, & 7 plus regrade areas 2, 3, 4 & CP | Operate through 2019 | \$1.03 | \$ 30,000,000 |
| Regrade areas 5, 6, & 7 plus develop area 8 | Operate through 2019 | \$1.75 | \$ 51,000,000 |
| Regrade areas 5, 6, & 7 plus regrade areas 2, 3, 4 & CP plus develop area 8 | Operate through 2022 | \$3.85 | \$113,000,000 |

Note: Lifecycle analysis is through 2028, the duration of the Interlocal Agreements.

Increased Recycling – Potential for Extending the Life of Cedar Hills

Policymakers and advisory committee members have asked what effect more aggressive recycling would have on extending the life of the landfill. Recycling efforts which began in the early 1990's, in addition to operating efficiencies and landfill settling, have contributed to extending the life of the landfill by about ten years. The current recycling rate of 41% is used in the forecast. The division has also considered the effect a more aggressive recycling rate would have on extending the life of Cedar Hills.

If the region could achieve a 60% recycling rate between 2009 and 2015, an additional 1.1 million tons of material would be diverted from the landfill. This would add approximately one year of life to the landfill. In order to achieve a 60% recycling rate, the region would have to agree to more aggressive recycling programs, such as banning certain materials from disposal at the landfill and expanding curbside recycling services to include additional materials.

Benefits of Extended Life

Disposal at the Cedar Hills Regional Landfill is the lowest cost disposal option for King County residents and businesses. Diverting tonnage from Cedar Hills prior to filling it to capacity increases the average cost of disposal. Extending the life of Cedar Hills will keep rates lower for a longer period of time by delaying costlier waste export. It will also provide more time to make improvements to the solid waste system in preparation for waste export.

Backup Capacity

In general, there is limited landfill backup capacity in western Washington. When Cedar Hills closes, capacity in the Puget Sound area will be limited to the City of Tacoma Landfill. Neither Seattle nor Snohomish County has maintained backup capacity of their own and both rely on their waste export contractors to provide backup to their primary hauling and disposal systems.

While interviewing local jurisdictions for this report about their experiences exporting waste, a number of them spoke about the need for backup disposal capacity in this region. Exporting jurisdictions described the operational impacts of occasional rail service disruptions they have experienced and shared their concerns about what would happen if there were an extended problem. Everyone identified Cedar Hills as the best available option for disposal backup.

The Solid Waste Division plans to convene a working group of interested jurisdictions in 2006 to discuss a cost sharing arrangement to secure the needed backup capacity for other jurisdictions' waste. A work program will be jointly developed to cover all of the aspects of a potential agreement.

Out-of-County Landfills

Table 4-2 provides a list of landfill sites owned by different companies potentially available to compete for King County's waste after Cedar Hills closes. Only one landfill is listed for

each of these disposal companies. Although some of the companies may also own other landfills, the landfill closest to King County is listed as it is assumed to be the most likely to compete for the county's waste. Additional landfills or other disposal options may be available by the time Cedar Hills reaches capacity and the county begins waste export. This is, therefore, a preliminary list that could change over time. It does not imply any preference for any landfill or company – the information is included to indicate the potential market for the county's waste.

Table 4-2. Out-of-County Landfill Capacity

| Landfill Name | Location | Owner | Miles From Seattle | Total Permitted Capacity (tons) | Remaining Capacity (2006) | Opening Year | Estimated Closure |
|--|----------------------|---|--------------------|---------------------------------|---------------------------|--------------|-------------------|
| Active Landfills | | | | | | | |
| 1 Columbia Ridge Landfill and Recycling Center | Gilliam County, OR | Waste Management | 325 | 221,875,000 | 205,000,000 | 1990 | 2060+ |
| 2 Roosevelt Regional Landfill | Klickitat County, WA | Allied Waste Industries dba Regional Disposal Co. | 330 | 244,600,000 | 214,200,000 | 1998 | 2073+ |
| 3 Finley Buttes Regional Landfill | Morrow County, OR | Waste Connections | 352 | 101,250,000 (See note 2) | 98,750,000 | 1990 | 2060+ |
| 4 Simco Road Regional Landfill | Elmore County, ID | Idaho Waste Systems | 628 | 210,000,000 (See note 1) | 200,000,000+ | 2000 | ~2040 |
| 5 Herzog Environmental, Inc. | Mora County, NM | Herzog Environmental, Inc. | 1,616 | "unlimited"* | | 2000 | 2100+ |
| Landfills Permitted, not Operating | | | | | | | |
| 6 Eagle Mountain Landfill | Riverside County, CA | L.A. County Sanitation Dist. | 1,325 | 560,000,000 | 560,000,000 | ~2010 | 2125 |
| 7 Mesquite Regional Landfill | Imperial County, CA | L.A. County Sanitation Dist. | 1,420 | 970,000,000 | 970,000,000 | ~2010 | 2110 |

Source: HDR

* Herzog Environmental Inc.'s company representative describes its annual capacity as "virtually unlimited."

Notes:

1. Simco Road Regional Landfill is currently expanding to a permitted capacity of 420 million tons.
2. Finley Buttes has potential to expand to a permitted capacity of 400,000,000 tons.

CHAPTER 5. LONG-HAUL TRANSPORT OPTIONS

Chapter Synopsis

This chapter describes and compares three transportation options: barge, truck and rail. Each option is examined for differences in travel time, reliability, and capital and operating costs.

There are currently at least five landfills in the western United States that could accept the county's solid waste (see Table 5-1). All are accessible by railway and truck. Only one of the five, Finley Buttes, is accessible by barge. Two additional landfills, Eagle Mountain and Mesquite, are expected to open around 2010 and will be accessible by rail and truck.

Table 5-1. Western U.S. Landfills

| Landfill Name / Location | Barge Access | Road Access | Rail Access |
|--|--------------|-------------|-------------|
| Columbia Ridge Landfill Gilliam County, Ore. | No | I-84 | UP* |
| Roosevelt Regional Landfill Klickitat County, Wash. | No | WA SR 14 | BNSF* |
| Finley Buttes Reg'l Landfill Morrow County, Ore. | Yes | I-84 | UP |
| Simco Road Regional Landfill Elmore County, Idaho | No | I-84 | UP |
| Herzog Environmental Inc. Mora County, N.M. | No | I-25 | BNSF UP |
| Eagle Mountain Landfill Riverside County, Calif. | No | I-10 | UP |
| Mesquite Regional Landfill Imperial County, Calif. | No | CA SR 78 | UP |

Source: HDR

* UP: Union Pacific Railroad; BNSF: Burlington Northern & Santa Fe Railway

Each mode of transport has distinguishing characteristics that help determine the most feasible and cost-effective transport option for exporting King County waste. Table 5-2 illustrates the relative costs and merits of barge, truck, and rail transport options.

Table 5-2. Comparison of Transport Options

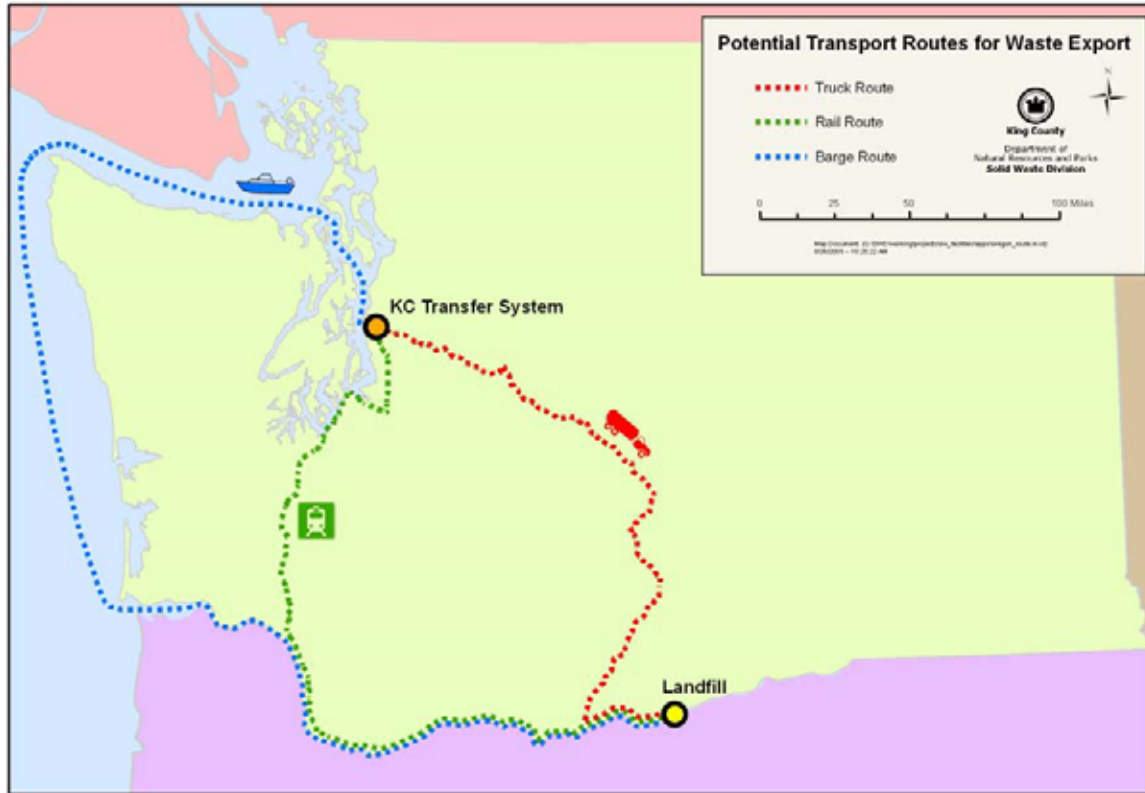
| | Barge | Truck | Rail |
|---|---|---|---|
| Travel distance (one-way) | 800 miles | 260 miles | 350 miles |
| Travel time (round-trip) | 11 days | 2 days | 3 days |
| Minimum containers needed (not incl. spares or emergency backup capacity) | 1,760 | 320 | 480 |
| Number and frequency of transports | 2 to 3 barges per day | 160 trucks per day | 4 trains per week |
| Minimum other equipment (not incl. spares) | 30 custom barges plus short haul trucks at destination | 320 trucks | 3 to 5 locomotives per train Rail cars (120 wells per train) |
| Facility needs | Intermodal facility w/dock | NA (would leave from transfer stations) | Intermodal facility |
| Factors affecting system reliability and dependability | Lock closures, storm delays | Weather, road conditions | Rail service interruptions |
| Impact on competition | Limited to one landfill More than one maritime provider | Multiple transport providers | Limited to 2 rail providers Access to multiple landfills |
| Impact on infrastructure | | Traffic and roadway congestion | Negligible increase in overall rail traffic |
| Relative capital costs | High | Medium | Medium |
| Relative operating costs | Medium | High | Low |

Source: HDR, R.W. Beck

For feasibility and cost comparison purposes, the following assumptions were made:

- MMSW would be long-hauled to a hypothetical location at least 260 miles one-way by road from Seattle (see Figure 5-1).
- The average annual amount of exported waste is expected to be 1.3 million tons, or 25,000 tons per week.
- Compacted loads will average 27 tons per container.
- Containers will be filled 362 days a year.

Figure 5-1. Potential Transportation Routes for Waste Export



Note: The three closest landfills to King County (Columbia Ridge, Roosevelt and Finley Buttes) are within 30 miles of each other on the Columbia River. This location is being used for the analysis of transport options but does not imply that it is where King County's waste will be disposed.

Barge Transport

Travel Distance and Time

The travel distance for barge transport is more than twice the distance of truck or rail. Vessels must travel through Puget Sound, around the Olympic Peninsula, and up the Columbia River through three sets of locks before reaching the landfill. The round-trip travel time for barge transport would be 11 days; nearly four times that of train transport and almost six times that of truck transport.

Containers and Equipment

Barging would require a minimum of 1,760 containers for regular operations. This quantity of containers would fill two to three barges daily with transport six days per week. Considering the 11-day trip time, about 30 barges would be required for system operations. In addition, trucks would be required to short-haul containers between local collection facilities and intermodal facility(ies) as well as between a destination intermodal facility and final disposal site.

Facility(ies) and Infrastructure

Barging requires intermodal facilities with dock access to navigable waterways at both ends of the water route at which containers can be loaded onto and off of barges. Sealed containers of waste are lifted off the transfer trailer chassis and placed onto barges at an intermodal facility and then transported to a second intermodal facility near the landfill. There the containers are transferred to trucks, hauled to the landfill, and emptied. The process is reversed to return the containers.

System Reliability

Columbia River locks close for about two weeks annually for maintenance. This would substantially exceed the three days of storage capacity proposed for King County transfer stations and intermodal facilities. This closure would require truck transport from the first dam on the Columbia River near Portland to the landfill for this period of time each year. In addition, during winter months, storm delays of one to three days can occur on the Washington coast and at the mouth of the Columbia River. Such events would also affect storage capacity and require additional containers and/or barges to manage the transport delay.

Other Considerations

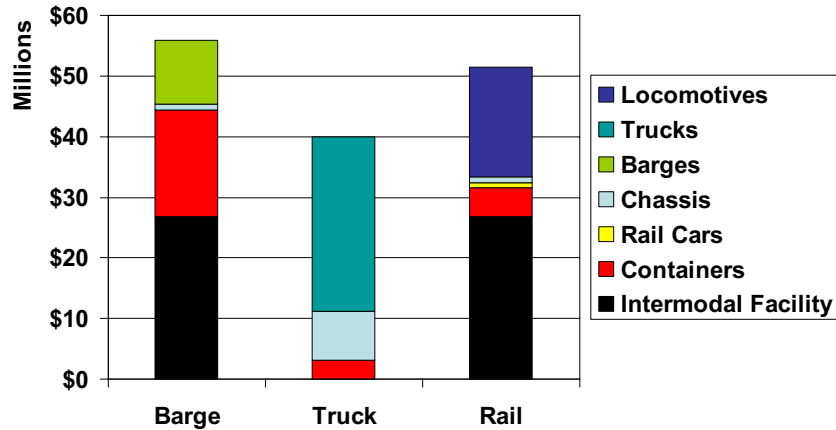
Only one landfill currently has waterway-to-intermodal facility access. This is a significant competitive limitation on barging as a transport method.

Oceangoing barges do not meet size limits for vessels passing through Columbia River locks. Waste would either have to be reloaded onto smaller river barges before passing through the locks, or custom oceangoing barges would have to be built that meet lock specifications. Custom barges would likely be more cost-effective than reloading but would require long-term contracts (10 to 20 years) to recover capital costs.

Capital Costs

Barge transport would require the greatest capital investment of the three options. It would require an intermodal facility(ies); four or six times the number of containers compared with rail or truck transport, respectively; and the construction of a fleet of barges specially designed and constructed for ocean and river use. Figure 5-2 details the capital investment required for each of the three modes of long-haul transport.

Figure 5-2. Transport Capital Cost Comparisons



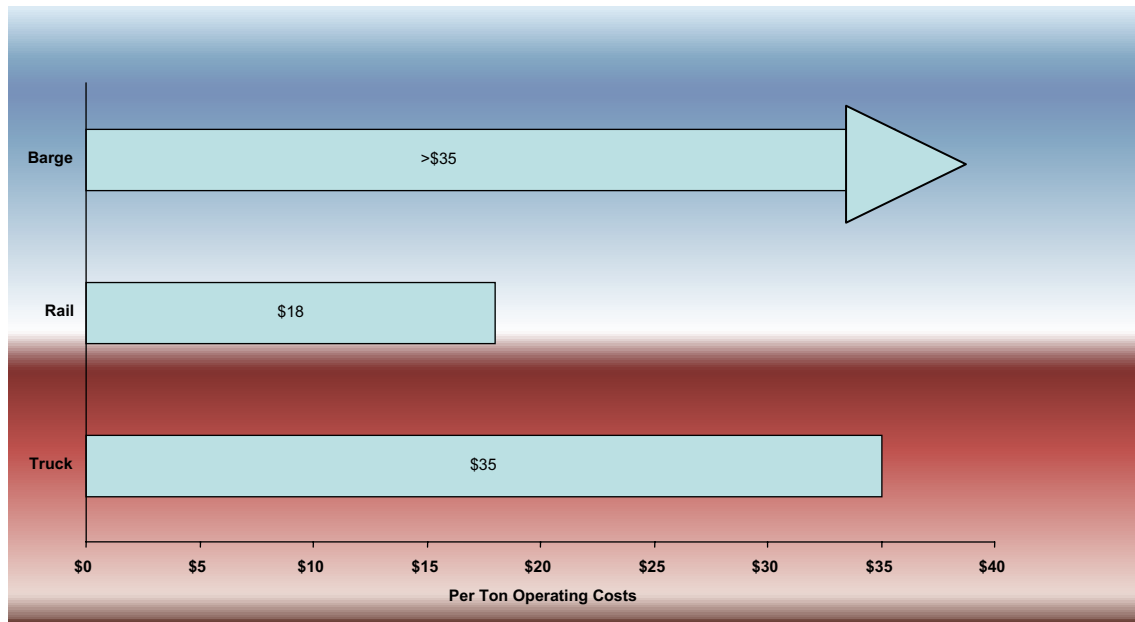
Operating Costs

It is unlikely that barging could be cost-competitive. Based on a rail haul cost model developed for King County by a consultant³, transport operating costs must be between \$10 and \$13 per ton, not including capital, intermodal, or short-haul operating costs, to be competitive with rail. Specific cost data are not available, but discussions with barge companies have indicated that their costs are significantly higher than this. Figure 5-3 illustrates the operating costs for each mode of long-haul transport.

The round-trip time of 11 days directly affects operating costs and because of the number of waste containers required, capital costs are significantly impacted as well. Travel time appears to be a fatal flaw in a barge transport system.

³ HDR

Figure 5-3. Transport Operating Cost Comparisons



Truck Transport

Travel Distance and Time

The travel distance and time for truck transport is shorter than either barge or rail transport. A truck driver could make the 520-mile round trip in two days.

Containers and Equipment

Truck transport of waste would require a minimum of 320 containers for regular operations. This quantity of containers would require 160 trucks daily with transport six days per week. With a round-trip travel time of two days, 320 trucks would be required for system operations.

Facility(ies) and Infrastructure

Transport via truck eliminates the need for intermodal capacity because containers are loaded directly onto truck trailers at a transfer station and then long-hauled to a disposal site.

System Reliability

Dependence on roadways introduces some level of risk to system reliability. Prolonged mountain pass closures and road closures due to weather conditions or natural disasters are possible. In emergencies, on-call contracts with barge or rail companies would be needed for transport services. On-call contracts typically are more expensive on a per-unit basis than long-term contracts.

Other Considerations

The county could contract with the private sector or use the county work force to operate the trucking fleet needed for this transport option. Regional traffic impacts could be significant.

Capital Costs

On a capital cost basis, truck transport would be the least expensive of the three modes of transport because it requires no intermodal facility and the fewest containers.

Operating Costs

Truck transport has the highest operating cost of the three modes of transport. Based on the division's experience with truck transportation costs, the long haul operating costs of trucking waste would be approximately \$35 per ton, labor being the largest component of additional cost. The comparable operating cost for rail transport is \$10 per ton in 2005 dollars. The operating cost for truck transport is significantly greater than the initial savings in capital costs compared to rail. Operating costs appear to be a fatal flaw for truck transport.

Rail Transport

Travel Distance and Time

The travel distance for rail transport is a little longer than for truck transport but less than half the distance of barge transport. The round-trip travel time for a train would be three days, one day slower than truck transport, but nearly four times faster than the travel time for barges.

Containers and Equipment

Rail transport would require a minimum of 480 containers for regular operations. This quantity of containers would fill one train four days per week. The containers would be double-stacked on the railroad cars. With a three-day round trip, and with three to five locomotives per train, the system would require up to 15 locomotives.

Facility(ies) and Infrastructure

Rail transport requires intermodal facilities with access to rail lines. Sealed containers of waste are lifted off transfer trailer chassis and placed on railroad cars at intermodal facility(ies) and then transported to a second intermodal facility near the landfill. There the containers are transferred to trucks, hauled to the landfill, and emptied. The process is reversed to return the containers.

Chapter Six describes the need for additional local intermodal infrastructure to provide consistent, long-term intermodal handling capacity to move the county's waste. Rail-hauling

the county's waste once it leaves the intermodal facility(ies) would not significantly increase current regional rail traffic. The additional trains that would be needed represent a trivial increase in the current volume of daily rail traffic. Studies indicate adequate main-line capacity will be available to export the region's waste when waste export is initiated in the next decade and for the 20-year planning horizon.

System Reliability

Rail transport is the most reliable and dependable of the three modes. Trains are less likely to suffer en route breakdowns than trucks and rail transport is less susceptible to weather delays than trucks or barges. However, service disruptions anywhere in the country can impact local operations.

Capital Costs

Capital costs for rail transport would be more than truck transport primarily because of the need for intermodal facility(ies) and because 50 percent more containers are required. Rail capital costs would be significantly less than the capital costs for barge transport.

Operating Costs

Rail transport has the lowest long-haul operating cost of the three modes at approximately \$10.00 per ton based on a consultant's rail haul cost model. This cost is lowest because a single train can do the work of more than 100 long-haul trucks on a daily basis. This cost does not include capital costs or intermodal and short-haul operating costs.

Based on their export contract, Snohomish County's waste transport costs are currently around \$28 per ton.⁴ This rate includes all costs of transporting containers between the rail receiving facility and the disposal site and includes all container storage, loading, and unloading costs. A comparable rate for Seattle is not available because their transport costs cannot be separately identified within their total cost for transport and disposal. Absent a formal procurement process to establish a long-haul contract, King County's costs are estimates based on models developed from recent experience in contract agreements between railroad firms and waste management firms. Long-haul rail transport of the county's solid waste appears to be the best option.

Summary

Given that the timeline for waste export is expected to be at least a decade away, detailed cost analyses were not performed at this stage of planning. Absent a formal procurement process, it is difficult to acquire accurate cost estimates. Preliminary research provided some estimates for barge and rail costs and Solid Waste Division operating information was used in analyzing trucking costs. The experience of neighboring jurisdictions has been used in reviewing the feasibility of the three modes of transport and their relative costs.

⁴ 2005 Snohomish County export contract.

Of the 16 counties in western Washington that export waste, all but two do so by rail. Wahkiakum County trucks its waste a relatively short distance to the Cowlitz County Landfill. Clark County barges its refuse approximately 180 miles up the Columbia River to the Finley Buttes Landfill. Portland trucks most of its waste 153 miles to the Columbia Ridge Landfill. Both the City of Seattle and Snohomish County use trains to export waste rather than trucks.

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CHAPTER 6. INTERMODAL FACILITY(IES)

Chapter Synopsis

This report does not make a recommendation on how intermodal services will be provided. Because full export of King County's waste is at least 9 years away, it is premature to decide if the county is going to develop or contract for intermodal facility(ies), and where it would be located. The Harbor Island property will be retained as a potential option for future intermodal capacity. Until that time, the division will continue leasing parts of the property to private businesses. If a decision is made to contract with the private sector for intermodal services, the Harbor Island property will be sold.

An intermodal facility is a location where cargo, in this case solid waste, is transferred from one mode of transportation to another. Sealed waste containers are trucked to intermodal facility(ies) and lifted onto railcars or barges. The containers are transported to a landfill, emptied, and then hauled back to the intermodal site. The county plans to use intermodal facility(ies) as part of a waste export and disposal system after the Cedar Hills Regional Landfill reaches permitted capacity and closes.

This chapter gives some background on other Washington State solid waste utilities' experiences with intermodal facilities and waste export. It then describes alternatives for obtaining intermodal capacity for King County waste.

Background – Regional Experience

With its transition to waste export, King County will add intermodal facility(ies) as part of its mixed municipal solid waste handling system. Discussions were held with several neighboring jurisdictions. The main findings from these discussions are as follows⁵:

- Many found an advantage in making the private disposal contractor responsible for owning and maintaining the containers. The contractor then assumes the risk of ensuring the provision of the right number of containers in the right place at the right time.
- Many found it preferable to have the contractor negotiate with the railroads and deal with day-to-day issues with the railroads such as delay in the return of trains and containers.
- Container shortages are a common problem. The contract terms should cover this risk.
- The private hauler should have a backup if the main transport system fails.
- With a long-term contract, it is recommended that the contract be split into a number of shorter, successive terms, or that the contract has "reopeners" that give a clear process to renegotiate aspects of the contract when needed.
- It is helpful to have a local backup landfill for emergencies. It would be a good planning effort for western Washington utilities to come up with a coordinated backup landfill option.

⁵ R W Beck, Technical Memorandum, October 18, 2005.

Intermodal Facility(ies) Considerations

General

A truck-to-train intermodal facility is more than just a transfer site along a stretch of rail line. It is a large, complex facility with unique requirements and constraints. The following minimum requirements⁶ are necessary for efficient intermodal transfer of solid waste:

- Size of the site – at least 10 acres,
- Site configuration – able to support the facilities and space needed for intra-site truck and train traffic including long lengths of track,
- Land use zoning – Industrial,
- Separation from residential areas – prefer sites that are not near to, or do not impact, residential areas,
- Proximity to railroads – within 200 feet, and
- Good access to the regional road system.

The ideal situation for intermodal operations would be:

- Accessible to both railroads operating in the western United States – Burlington Northern and Santa Fe Railway (BNSF) and Union Pacific Railroad (UP)
- Strategically located in relation to the county's network of transfer stations to minimize short-haul truck transport costs
- Sufficient size to handle the county's projected waste stream
- Located in an industrial area with compatible uses
- Accessible to roads that can handle truck traffic

However, it is recognized that siting intermodal facility(ies) to meet all of these criteria may not be possible.

Reliable waste export depends on consistent, long-term intermodal handling capacity to move the county's waste. A 2003 study found there to be insufficient intermodal facility capacity to reliably handle the region's waste in the future⁷. Since that study was completed, Waste Connections purchased Northwest Containers in South Seattle, adding to the intermodal capacity available for solid waste. In addition, the City of Seattle has plans to build an intermodal facility, which may include extra capacity for "partner waste." The amount of intermodal capacity available at the time of export will be determined as part of the design or procurement process.

Existing Intermodal Facilities

There are two types of facilities where containers are moved between trucks and trains – intermodal facilities and spot facilities.

⁶ RCW 70.95.165; SWANA Certification Course Manual; 1992 Solid Waste Plan

⁷ HDR. "Business Case for a County Owned Intermodal Facility," 2003.

Intermodal Facilities

Intermodal facilities are yards capable of handling the arrival and departure of whole trains, the loading and unloading of cargo from the trains, and the storing of full and empty cargo containers. Currently there are four intermodal facilities in the county that handle commercial cargo, and only one of these facilities, Argo Yard, currently handles solid waste. Three of these existing intermodal facilities were developed and are owned by the two railroads that serve the western United States. The UP intermodal facility is at the Argo Yard in South Seattle, and the BNSF has two intermodal facilities – one at its Seattle International Gateway in Seattle’s SODO District and the other at the South Seattle Domestic Intermodal HUB near Tukwila. The fourth intermodal facility is on Edmunds Street in Seattle, which is owned by Northwest Container (Waste Connections). This facility currently sends most of its freight to Portland.

Spot Facilities

Spot facilities are areas where groups of rail cars can be set or “spotted” for loading and unloading by switch engines. Spot facilities normally do not have the rail space for the arrival and departure of whole trains on one track and are dependent upon other rail yards or support track for the make-up or break-up of trains.⁸

There are two spot facilities in the region where waste containers are loaded from trucks to train cars. They are located on tracks adjacent to Allied Waste Industries, Inc.’s (Allied’s) Third and Lander transfer station, in Seattle’s SODO District, and on tracks adjacent to Allied’s Black River Quarry in Renton, which handles construction, demolition and landclearing debris. Both sites are accessible only by BNSF tracks, and both are dependent on BNSF’s Interbay Rail Yard near the Magnolia neighborhood in Seattle for assembly and disassembly of trains.

Regional Intermodal Needs

Approximately 850,000 tons of waste are exported annually from King County, consisting of the City of Seattle’s municipal waste stream and Seattle and King County’s construction, demolition and landclearing debris. When King County begins exporting its solid waste, approximately 2.3 million tons of waste will be exported from the county each year, an increase of 170% over current levels.

The region’s existing intermodal facilities are built out to capacity with no space to physically expand. Expansion of existing intermodal capacity can only be achieved through additional work shifts and tighter rail schedules. Any expansion of intermodal capacity for solid waste handling at these facilities, however, would be problematic because it would significantly impact commercial cargo handling capacity for the railroads and the Port of Seattle. International intermodal traffic is projected to grow over the next 20 years, and increases in capacity for handling cargo will likely make it even more difficult and expensive to add capacity to handle solid waste. Guaranteed, dependable intermodal capacity is essential for waste export by rail to be a viable disposal alternative.

⁸ Ibid.

Given this situation, it may be difficult for a potential hauler-competitor to secure space at existing intermodal facilities and make agreements with the railroad companies to haul the county's waste. If the county relied entirely on one of the existing intermodal facilities, that reliance could limit the choice of landfills to those served by that railroad company. Similarly, if a private-sector firm developed intermodal facility(ies), it might site on the rail line that served its own landfill. Truly competitive choices depend on adequate intermodal capacity that is accessible to both rail lines and all potential solid waste export companies.

The City of Seattle has concluded that local existing intermodal capability is insufficient and has decided to develop its own full-scale intermodal facility. Seattle Public Utilities has undertaken work to find an appropriate site, and expects to make a final decision early in 2006. As of October 2005, Seattle is evaluating four alternatives for their new intermodal facility:⁹

- Harbor Island – Terminal 10, site A.
- Harbor Island – Terminal 10, site B.
- Edmunds Street in South Seattle, about one mile south of the interchange connecting I-5 with Spokane Street. This site is at the south end of the Northwest Container property.
- Corgiat Drive, northeast of Boeing Field, about 1,500 feet from the runway.

County's Intermodal Facility Needs

The county's responsibility is to ensure that waste disposal is provided at the lowest cost, reliably, and consistent with goals for environmental protection and waste reduction and recycling. Any approach to intermodal facility(ies), as part of the waste export system, must address two key concerns:

- Ensure long-term competition in the marketplace for solid waste transport and disposal services, and
- Ensure sufficient long-term intermodal handling capacity for the county's solid waste.

While mainline railroad capacity in the Puget Sound region is currently available, new intermodal capacity must be developed in order to ensure a reliable and consistent export system for the county's waste in the long-term.

Promotion of Competitive Choices

Having a choice of alternatives for developing new intermodal capacity should enhance long-term competition for solid waste services among private-sector providers when the county moves to waste export.

At present, there are three major providers of waste export disposal services in the region – Allied Waste Industries, Inc., which exports to Roosevelt Landfill in Klickitat County; Waste Management, Inc., which exports to Columbia Ridge Landfill in Arlington, Oregon; and Waste Connections, which owns and operates the Finley Buttes Landfill in Oregon. These

⁹ City of Seattle, Solid Waste Intermodal Transfer Facility Final Supplemental Environmental Impact Statement, August 5, 2005.

three companies have secured local intermodal and spot capacity to transport waste to their landfills.

Other disposal companies would need to obtain local intermodal capacity to compete for King County's solid waste. Developing new intermodal facility(ies) dedicated to handling the county's waste, and situated to be served by both major rail lines, would allow for access to a variety of disposal sites.

There are currently at least five companies with existing and planned landfills potentially able to receive the county's waste (see Table 5-1).

Intermodal Facility(ies) Alternatives

There are three basic ownership and operating options for the intermodal facility(ies) that could serve the county's solid waste export needs:

- Public ownership and operation
- Public ownership and private (contracted) operation
- Private ownership and operation (contracted services)

The benefits and drawbacks of each of these alternatives are described below.

Public Ownership and Operation

Benefits:

- Publicly owned and operated intermodal facility(ies) would provide the county with maximum flexibility to coordinate all elements of the county's solid waste system.
- The county would have guaranteed intermodal capacity under its exclusive control.
- The county would be in a better position to change its disposal arrangement if it is not tied to a long-term contract for intermodal facility(ies) operation.
- Future competition in the region could be encouraged by maintaining independence from a single, vertically integrated company handling all aspects of waste export and disposal.

Drawbacks:

- The county does not have any experience operating truck-to-rail intermodal facility(ies).
- The county would have the responsibility for siting intermodal facility(ies).
- The county would be responsible for the capital cost of facility(ies).
- The county would be responsible for the maintenance cost of facility(ies).
- The county would have to interface directly with the serving railroads in order to negotiate long-term service contracts and to deal with day-to-day issues such as delay in return of trains and containers.
- The county would have to arrange for backup service through other contracts if the primary train-haul system is disrupted.
- The county's union work rules would likely restrict the county's flexibility to work around unexpected fluctuations in workload at facility(ies) compared to a private operator. For example, a private contractor might be more able to shift its labor

force and/or use contract labor to cope with changing work demands at the facility(ies).

- Public sector labor restrictions in Washington State could be an obstacle to privatizing the system in the future.

Public Ownership with Private Operation

Benefits:

- The county would have considerable flexibility to coordinate all elements of the solid waste system.
- The county would have guaranteed intermodal capacity under its exclusive control.
- The county would have the benefit of competitively bid operating services and could expect this to keep costs down.
- The county could contract with an entity experienced in operating intermodal facility(ies).
- The county would benefit from contractor's experiences with negotiations with the railroads.
- If operation of intermodal facility(ies) is bundled with long-haul responsibility, the county could require the operating contractor to provide backup transportation and reserve containers in the event of a rail system disruption.

Drawbacks:

- The county would have the responsibility for siting intermodal facility(ies) unless it procured the facility under a design-build-operate (DBO) alternative delivery method that tasked the DBO contractor with siting responsibility.
- The county would have the responsibility for the capital costs of facility(ies) unless it procured the facility(ies) under a design-build-own-operate-transfer (DBOOT) alternative delivery method that made the DBOOT contractor responsible for the capital cost. Under a DBOOT approach those costs would, however, be reflected in the cost of service.
- The county would be more likely to be tied to a single, vertically integrated company handling all aspects of waste export and disposal, which could work against the county's long-term interests by discouraging future competition in the region.

Private Ownership and Operation

Benefits:

- The county would avoid upfront capital costs of developing intermodal facility(ies). Those costs would, however, be reflected in the cost of service to rate payers.
- The county would not be responsible for the siting of intermodal facility(ies).
- The county could expect the cost-competitive bundling of services between the intermodal facility(ies) operation and long-haul and disposal to drive down costs to the lowest possible level.
- If operation of the intermodal facility(ies) is bundled with long-haul responsibility, the county could require the operating contractor to provide backup transportation and reserve containers in the event of a rail system disruption.
- The county would not have the responsibility for facility(ies) maintenance.

- The county would avoid having to interface directly with the serving railroad.

Drawbacks:

- The county would lack the guaranteed intermodal capacity under its exclusive control and could find itself without such service or access to the rail system in the future.
- The county would have much less flexibility to coordinate all elements of the solid waste system and would need to rely on contract terms to ensure that its interests and waste export needs are addressed.
- The county would very likely enable a single, vertically integrated company to handle all aspects of waste export and disposal, which could work against the county's long-term interests by discouraging future competition in the region.

Summary

In summary, there is limited intermodal truck-to-rail capacity in the region and the prospects are for greater competition for this limited resource in the years ahead. The county will be adding significant waste tonnage to the intermodal and rail capacity as it transitions to waste export. Developing intermodal facility(ies) dedicated to the county's solid waste export needs would be a prudent and effective approach to meeting the region's long-term waste disposal needs.

Each of the three basic alternatives for ownership and operation of the intermodal facility(ies) has a unique set of benefits and drawbacks. Careful and timely consideration of these alternatives by decision makers will be needed as part of the waste export system plan.

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Chapter 7. SENSITIVITY ANALYSIS

Synopsis

At the request of the MSWMAC, the division agreed to analyze partial early waste export, total early waste export and withdrawal of some waste from the system. That analysis is presented in this chapter.

Introduction

Chapter Four described landfill capacity and the benefits of extending the useful life of Cedar Hills Regional Landfill. ITSG and MSWMAC identified early waste export as another potential option for extending the useful life of Cedar Hills. The division agreed to conduct a sensitivity analysis of three scenarios that would reduce the tonnage disposed at the landfill. The three scenarios presented in this chapter are:

1. Full early export: Cedar Hills is closed before reaching capacity and 100% of the county's solid waste is exported beginning in 2010.
2. Partial early export: Cedar Hills remains open and 20% of the county's solid waste is exported starting in 2010.
3. Partial withdrawal: 20% of the county's solid waste becomes part of another solid waste system in 2010.

The division has analyzed the possibility of early waste export annually since publishing the 1989, CSWMP. Each time early export has appeared to be more expensive than filling Cedar Hills completely before beginning waste export. As a result of recent changes, such as the cost increase from rent on the Cedar Hills Regional Landfill, partial early waste export is an option warranting further analysis.

ITSG and MSWMAC also discussed the potential effect on the solid waste system if a portion of waste was withdrawn from the system entirely. The advisory committees wanted to know what the impacts would be if some part of King County's federated system of 37 cities were to join a different solid waste system or form a separate system. The division performed a sensitivity analysis to identify the impacts of reducing the tonnage that is processed through the King County solid waste system. The analysis can only look at a general reduction in tonnage because no city has stated an interest in leaving the King County solid waste system. It also considers only the impact of such a reduction on the King County system; such tonnage leaving would have to bear the cost of a new system.

Exporting means that waste enters the King County transfer system but is then rerouted somewhere outside of King County for disposal. Withdrawal means that tonnage never enters the King County transfer, transport or disposal system, generating no revenue for the King County solid waste system.

The division performed sensitivity analyses to identify the outcomes of the three scenarios.

These options were compared to the current landfill development plan, which would continue to use Cedar Hills until it is full before shifting to waste export (currently forecast to take place at the end of 2015). The year 2010 was selected for analysis in all three

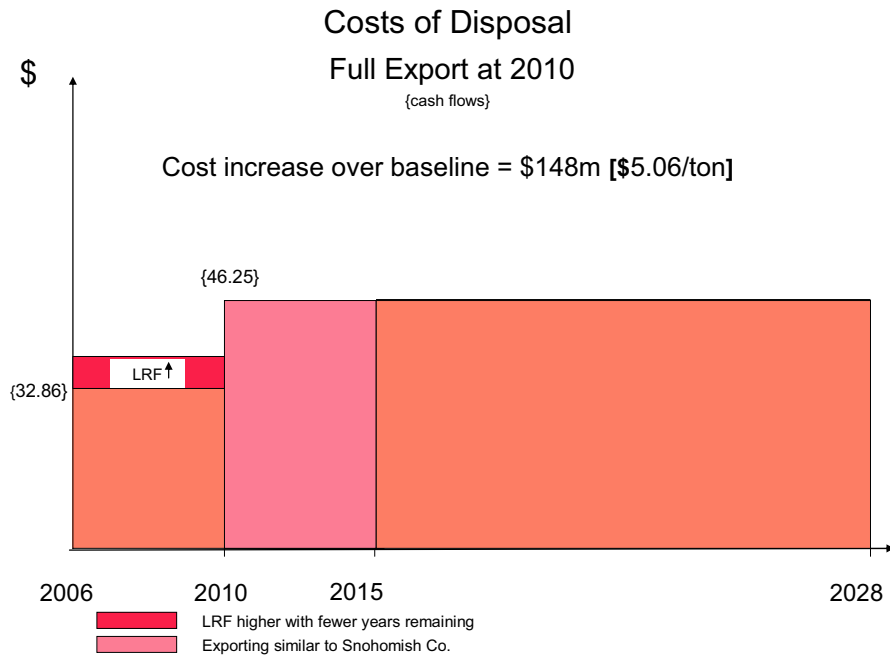
scenarios as the earliest feasible start date for any major system change. Twenty percent was the percentage used for sensitivity evaluation. The same percentage is used in both scenarios (b) and (c). By using the same percentage to evaluate both options, it is possible to identify the differences between the impacts of each scenario. Snohomish County's combined export costs (transport and disposal) of \$46.25 were used. These costs are similar to the City of Seattle's.

Full Early Export

This scenario would accelerate the closure of Cedar Hills Regional Landfill so that all of King County’s waste would be diverted from the landfill and exported to an out-of-county disposal facility. In this analysis it was assumed that this could begin in 2010 because this is the earliest the county could move ahead with this option. For the purpose of analysis, it is assumed that transfer station and short-haul costs would not change. However, the average total cost per ton would rise, primarily to cover the new cost of long-haul transport.

Full early export would require a substantially increased contribution to the legally required Landfill Reserve Fund (LRF) for closure and post-closure maintenance costs. Contributions would increase because there would be fewer years available to make the fund payments, which must provide for maintenance of Cedar Hills for 30 years after closure. Figure 7-1 illustrates these effects.

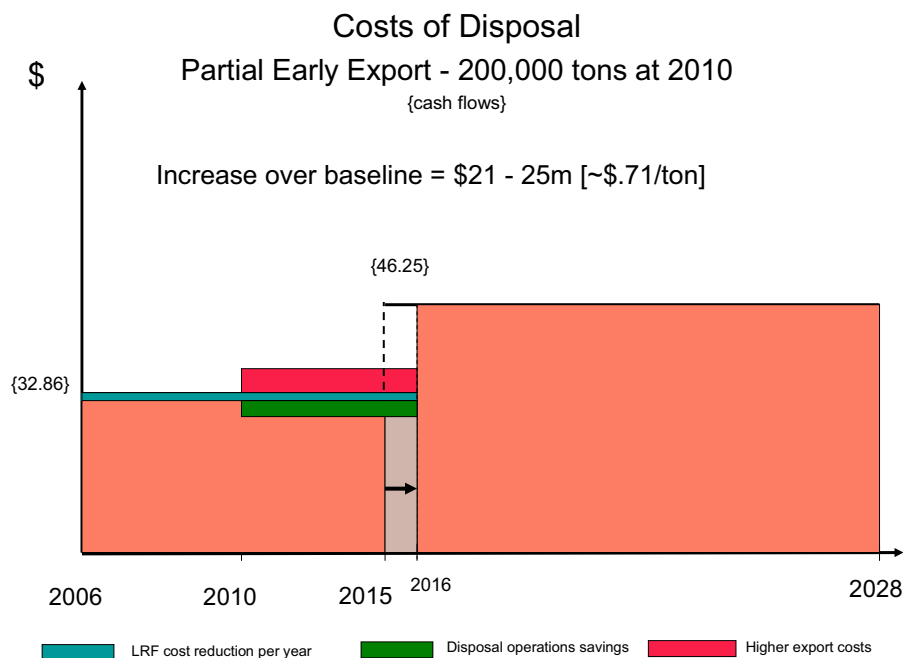
Figure 7-1. Full Early Export Costs



Partial Early Export

In this case, 200,000 tons of waste (20% of the current waste stream) would be exported beginning in 2010. This scenario is more complicated than complete early export because export will be taking place while Cedar Hills is still in operation. Figure 7-2 displays each of the costs and savings associated with this scenario. The costs for the 20% of the waste stream exported would be higher than the costs of disposal at Cedar Hills. However, partial early export would extend the life of the landfill by about one year, which has two important impacts. First, this would lower the per ton contribution to the Landfill Reserve Fund beginning in 2006. Second, and more importantly, delaying export of the remaining 80% of the waste stream for even one year means that 80% of the waste stream continues to cost the lower Cedar Hills' disposal amount for one more year. Keeping Cedar Hills open longer may also provide negotiating leverage at the time of initial waste export. Partial early export costs include an additional year of disposal at Cedar Hills. The end result is somewhat more expensive than the current development plan.

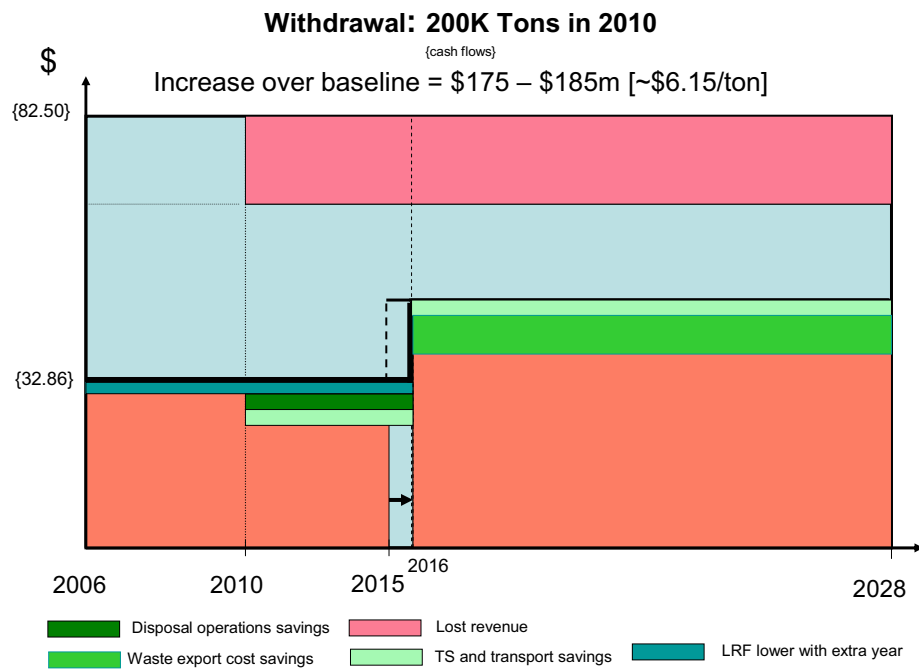
Figure 7-2. Partial Early Export Costs



Partial Withdrawal

This scenario involves the same amount of tonnage as partial early export. In this scenario 20% of the waste stream would no longer be processed through the transfer stations, require short-haul to Cedar Hills or disposal at Cedar Hills. These changes result in operating cost savings. In addition, after 2016 these tons would also not require costly waste export. However, unlike the tonnage in the early export scenarios, withdrawn tonnage does not generate revenue for the system. Compared to operational savings, lost revenue is substantial, as shown in Figure 7-3. The scenario results in a substantial net loss compared to the baseline scenario. King County would require that departing jurisdiction(s) make the system whole; the remaining ratepayers would not have to absorb the added costs.

Figure 7-3. Cost of Partial Withdrawal



Summary

Figure 7-4 provides a summary of costs for the three scenarios. The full early export option is quite expensive compared to the current development plan scenario because the higher costs of long-haul transport would be added to the system at least five years early. Withdrawing 20% of the waste stream from the system is far more costly because revenue losses outweigh operational cost savings.

However, the cost of partial early export merits further investigation to determine whether some variation of this option may result in cost savings.

Figure 7-4. Scenario Cost Summary

| Overall of Net Impacts Increased costs compared to baseline | |
|---|---------------------|
| Cash Flow | |
| Full Export at 2010 | \$148 million |
| Partial Export at 2010 | \$20 – 25 million |
| Partial Withdrawal at 2010 | \$175 – 185 million |

CHAPTER 8. NEXT STEPS

The next step in the waste export planning process is to complete the Waste Export System Plan, scheduled to be transmitted to the King County Council by April 30, 2006. Building upon the four milestone reports, this document will make final recommendations for a solid waste handling system, including transfer system and waste export system options and system ownership. As in the four milestone reports, the Solid Waste Division, SWAC, ITSG, MSWMAC, haulers, and labor will collaborate on developing this final plan. The Waste Export System Plan will provide the division and the region with a set of recommendations for providing solid waste ratepayers with effective and efficient solid waste handling infrastructure and operations.

Before final approval by the council, the Waste Export System Plan will undergo an independent third-party evaluation. The council will arrange for an expert independent review panel to review system plans and recommendations to inform the county's decision-making on waste export. The council, after consultation with the Solid Waste Interlocal Forum or its successor, will define the scope of the evaluation to be conducted and will guide the selection of independent review panel members. The Solid Waste Division welcomes this review.

The Waste Export System Plan will also inform the transfer and disposal sections of the update to the 2001 Comprehensive Solid Waste Management Plan. This update takes place from late 2005 through 2007 and will involve extensive public participation. Waste export planning work will provide critical information for this update, and the plan will detail options for the future of recycling and waste diversion in King County, which are important to minimizing the amount of waste that has to be exported.

The division will also prepare a business plan as part of waste export planning. This plan will address, at a minimum:

- Emergency capacity
- System reliability
- Regional coordination
- Employment in a future system
- Competition
- Preserving levels of service
- Environmental protection
- Potential benefits of a federated system.

Further requirements of Ordinance 14971 direct ITSG to address the following issues:

- Potential modification or replacement of the solid waste interlocal forum, to identify membership, decision-making responsibilities and scope of duties;
- Identification of dispute resolution options;
- Development of a framework for financial policies and host city mitigation, including compensation agreements;

- Evaluation of the impact of the proposed waste export system plan on each of the provisions of the solid waste interlocal agreement between King County and cities;
- Identification of potential amendments to the solid waste interlocal agreement.