King County

1200 King County Courthouse
516 Third Avenue
Seattle, WA 98104

KING COUNTY

Signature Report

September 27, 2016

Ordinance 18377

Proposed No. 2016-0386.2 **Sponsors** Upthegrove

AN ORDINANCE relating to solid waste fees charged at recycling and transfer facilities and at the Cedar Hills regional landfill; and amending Ordinance 12564, Section 2, as amended, and K.C.C. 10.12.021.

STATEMENT OF FACTS:

1. The solid waste division of the department of natural resources and parks provides essential public services that protect human health, the environment, and the quality of life in our region.

2. The solid waste division operates the Cedar Hills regional landfill, eight transfer stations, and two drop boxes. It also provides innovative programs to help customers recycle and prevent waste.

3. The solid waste division is an enterprise fund, supporting almost all (ninety-five percent) of its services with a basic fee charged for each ton of municipal solid waste received at county facilities.

4. The solid waste basic fee for 2013-2014 took effect on January 1, 2013, with a further increase scheduled for the 2015-2016 rate period.

5. By achieving efficiencies and refocusing priorities, the division extended the 2013-2014 two-year rate for an additional two years, saving customers twenty-two million dollars in 2015 and 2016.

6. A fee increase can no longer be deferred if the solid waste division is to sustain current services, repay debt on previously approved transfer station projects, plan and provide system handling and disposal capacity into the future and expand recycling programs throughout the system.

7. The proposed new basic fee is less than the 2017 fee projected in the last rate proposal and in line with rates charged by comparable solid waste service providers in the region.

BE IT ORDAINED BY THE COUNCIL OF KING COUNTY:

SECTION 1. A. This ordinance proposes changes to the fees currently charged for solid waste disposal at solid waste transfer stations and drop boxes and at the Cedar Hills regional landfill.

B. These fees are established and assessed pursuant to RCW 36.58.040, RCW 70.93.070 and K.C.C. 10.08.040.

SECTION 2. Ordinance 12564, Section 2, as amended, and K.C.C. 10.12.021 are each hereby amended as follows:

A. All persons using county-operated solid waste transfer stations and drop boxes shall pay the service fees in the following schedules:

1. Solid waste disposal:

Passenger cars	$((~~19.22~~)) 21.60 per entry
Other vehicles	$((~~120.17~~)) 134.59 per ton
Charitable organizations	$((~~92.55~~)) 103.63 per ton
Minimum	$((~~19.22~~)) 21.60 per vehicle
Charitable organizations, minimum charge	$((~~15.08~~)) 16.58 per entry

2. Deposit of source-separated yard waste at yard waste collection areas, clean wood at clean wood collection areas, or any combination thereof:

Passenger cars	$12.00 per entry
Other vehicles	$75.00 per ton
Minimum charge	$12.00 per vehicle

3. Deposit of white goods at white goods collection areas:

White goods without regulated refrigerants	$10.00 per unit
White goods with regulated refrigerants	$30.00 per unit

B. Service fees for the use of solid waste facilities without scales shall be based upon the cubic yard or fraction thereof as follows:

1. Solid waste disposal:

Passenger cars	$((~~19.67~~)) 21.60 per entry
Other vehicles:	
Compacted wastes	$((~~35.31~~)) 39.03 per cubic yard
Uncompacted wastes	$((~~20.70~~)) 22.88 per cubic yard
Minimum charge	$((~~19.67~~)) 21.60 per vehicle

2. Deposit of source-separated yard waste at yard waste collection areas, clean wood at clean wood collection areas, or any combination thereof:

Passenger cars	$12.00 per entry
Other vehicles:	
Compacted wastes	$21.75 per cubic yard
Uncompacted wastes	$12.75 per cubic yard
Minimum charge	$12.00 per vehicle

C. Service fees at the Cedar Hills regional landfill shall be:

Cedar Hills Regional Direct	$((~~103.50~~)) 114.00 per ton
Other vehicles	$((~~121.75~~)) 134.59 per ton

Disposal by other vehicles is at the discretion of the division director.

D. A moderate-risk waste surcharge shall be added to all solid waste disposed by nonsolid waste collection entities using county operated solid waste facilities. The fee schedule is as follows:

1. For facilities with scales:

Self-haulers	$4.73 per ton
Minimum charge	$1.81 per entry
Passenger cars	$1.81 per entry

2. For facilities without scales:

Compacted	$1.04 per cubic yard
Uncompacted	$0.59 per cubic yard
Minimum charge	$1.81 per entry
Passenger cars	$1.81 per entry

E. As determined by the division director, a special waste fee shall be charged for special waste including asbestos-containing waste material and other wastes requiring clearances in accordance with King County Board of Health Code Title 10 or rules adopted by the department.

Special waste fee	$((~~145.00~~)) 162.00 per ton
Special waste fee minimum charge	$((~~23.20~~)) 25.84 per entry
Special waste fee, extra handling	$((~~175.00~~)) 188.00 per ton

Special waste fee, extra handling minimum charge		$((~~28.00~~)) 30.15 per entry

F. In the absence of exact weights or measurements, the estimate of the solid waste division director is binding upon the user.

G. The solid waste division director may establish fees for handling and processing of recyclable materials for which no other fee has been established by

ordinance. Consistent with WRR-1, WRR-2, WWR-4 and WRR-36, the fees need not recover the full cost of handling and processing.

Ordinance 18377 was introduced on 8/15/2016 and passed as amended by the Metropolitan King County Council on 9/26/2016, by the following vote:

Yes: 8 - Mr. von Reichbauer, Mr. Gossett, Ms. Lambert, Mr. Dunn, Mr. McDermott, Mr. Dembowski, Mr. Upthegrove and Ms. Kohl-Welles
No: 0
Excused: 1 - Ms. Balducci

KING COUNTY COUNCIL
KING COUNTY, WASHINGTON

J. Joseph McDermott, Chair

ATTEST:

Anne Noris, Clerk of the Council

APPROVED this 6 day of OCTOBER, 2016.

Dow Constantine, County Executive

RECEIVED
2016 OCT -7 PM 4:02
CLERK
KING COUNTY COUNCIL

Attachments: A. Executive Proposed Solid Waste Disposal Fees for 2017-2018

Executive Proposed Solid Waste Disposal Fees for 2017-2018

June 30, 2016

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Executive Proposed Solid Waste Disposal Fees for 2017 and 2018

Executive Summary

The King County Solid Waste Division operates eight transfer stations, the Cedar Hills regional landfill, and waste prevention and recycling programs for the unincorporated area and 37 partner cities. The division is proposing an increase in its basic rate (tipping fee) from $120.17 to $137.75 per ton for 2017 and 2018. Other King County solid waste rates and fees are unchanged except for those set as a percent of the basic rate. The system wide average effect on single-family curbside customers would be about $0.94 per month, representing a five percent increase on a $20 monthly bill, which is in the mid-range of bills charged in partner cities and the unincorporated area.

The current rate was adopted for 2013-2014, with an increase scheduled for 2015-2016. While the impacts of the recent recession were reverberating through the economy, the Solid Waste Division pursued efficiencies and deferred facility maintenance and equipment replacement to make the two-year rate last four years, and give the economy and consumers time to more robustly and sustainably recover. Had rates increased as planned in 2015, customers would have paid $22 million more during the 2015-2016 biennium. The cost of current services has increased over the past four years and further deferral of investments in equipment and operations would have significant adverse impacts to the solid waste system. The proposed 2017-2018 rate will provide revenue needed to sustain current services, help catch-up on deferred system investments, and adapt to a rapidly changing industry.

The new rate will primarily fund the increased cost of current services, including waste transfer, disposal, and waste prevention and recycling programs, while maintaining fundamental support services, such as human resources, finance, and system-wide planning conducted in conjunction with partner cities. The rate also repays new debt for construction of previously approved new transfer stations at Factoria and South County.

In addition to sustaining current services, new spending is proposed to:

- **Enhance service reliability** including upgrading the transfer station cashiering system, improving wastewater systems at Cedar Hills to ensure continued regulatory compliance, education costs and operational changes required to implement new recycling requirements for transfer station self-haulers, and completing new development in Area 8 to extend the life of Cedar Hills.

- **Implement the Equity and Social Justice (ESJ) Initiative and the Strategic Climate Action Plan** through the "Recicla Más. ¡Es Facilísmo!" program, installing Spanish language signs at transfer stations and establishing an opportunity fund for staff-generated actions to advance ESJ goals. Initiatives like piloting compressed natural gas/diesel hybrid technology within the division fleet support the goals of the Strategic Climate Action Plan.
- **Position for the Future** by conducting a demand management pilot project in 2018 to test changes to services, hours, and prices at existing transfer stations. If the demand management pilot program meets its goals, it could alleviate the pressure to build new transfer stations or alternatively, reduce the costs of a new station currently estimated at $97 million, reducing future rate increases.

The proposed 2017-2018 basic fee of $137.75 per ton is slightly lower than the $140.00 per ton fee projected for 2017 in the last rate proposal. It is also in line with rates for comparable solid waste providers in the region – lower than Pierce County, but higher than Snohomish County.

Introduction

King County has provided reliable, environmentally responsible solid waste services for fifty years. Since introducing recycling programs in the 1980s, King County has been a leader in diverting waste from the landfill with residents and businesses recycling 54 percent of their waste in 2013, the last year for which State-collected data is available. The *2015 Strategic Climate Action Plan* set higher goals – striving for a recycling rate of 70 percent by 2020 as a crucial step toward the long-term goal of zero waste of resources by 2030.

Interlocal agreements require the division to provide disposal for signatory cities through 2040, yet low-cost capacity at the Cedar Hills Regional Landfill (Cedar Hills) is finite. The adopted 2001 *Comprehensive Solid Waste Management Plan* (Comp Plan) states, "the policy of King County shall be to monitor and analyze conditions impacting the appropriateness, feasibility, and timing of waste export on a continuous basis." The 2006 *Solid Waste Transfer and Waste Management Plan* calls for waste to be exported when Cedar Hills reaches capacity and for the division to maximize the capacity of Cedar Hills "subject to environmental constraints, relative costs to operate, and stakeholder interests." Development of Cedar Hills Area 8, approved in the *2010 Cedar Hills Project Program Plan*, provides capacity into 2027. Cost-effective capacity through 2040 could be provided through development beyond Area 8.

After avoiding a previously planned rate increase for 2015-2016, the division is proposing a rate increase effective January 1, 2017, to continue providing safe, sustainable, and environmentally sound management of the region's solid waste, and to reach the county's goals for recycling. Under this proposal, the basic fee would increase from $120.17 per ton to $137.75 per ton for the two-year period of 2017 and 2018, which is consistent with the rate forecast in 2012. The system-wide average effect on single-family curbside customers would be about $0.94 per month, representing a five percent increase on a $20 monthly bill, which is in the mid-range of bills charged in partner cities and the unincorporated area.

Proposed Fees

The following fees are proposed to change on January 1, 2017:

- **Basic Fee:** A fee charged to commercial curbside collection companies and to residential and business self-haulers who bring solid waste to division transfer facilities. The basic fee accounts for more than 95 percent of revenues. The division proposes an increase in the basic fee from $120.17 to $137.75 per ton for 2017 and 2018.

As a consequence of the increase in the basic fee, the other fees that are meaningfully impacted by the increase in the basic fee are the Regional Direct Fee, the Special Waste Fee, and Special Waste Extra Handling Fee. Collectively, these fees make up approximately one percent of total revenue.

- **Regional Direct Fee:** A discounted fee charged to commercial collection companies that haul solid waste to Cedar Hills from their own facilities, thus bypassing division transfer stations. The fee is approximately 85 percent of the basic fee; this fee will increase by approximately 13 percent, to $117 per ton.

- **Special Waste Fee:** Special wastes are non-hazardous waste materials that require special handling and/or record-keeping. Special waste must be cleared through the division's waste clearance program. The special waste fee will increase by approximately 14 percent to $165 per ton.

- **Special Waste Extra Handling Fee**: Some special wastes, such as asbestos, are more expensive to manage due to handling and record-keeping requirements beyond the waste clearance process. The special waste extra handling fee will increase by 10 percent to $193 per ton.

All other King County solid waste rates and fees will be unchanged. **Table 1** compares current and proposed fees charged by the division.

Table 1: Comparison of current and proposed tipping fees

	Last Change	Current Fee ($)	Proposed Fee ($)	Change in Fee ($)	Percent Change
Basic	**2013**	**120.17**	**137.75**	**17.58**	**15%**
Regional Direct	**2013**	**103.50**	**117.00**	**13.50**	**13%**
Yard Waste and Clean Wood	**2013**	**75.00**	**75. 00**	**---**	**---**
Special Waste	**2013**	**145.00**	**165.00**	**20.00**	**14%**
Special Waste - extra handling	**2013**	**175.00**	**193.00**	**18.00**	**10%**
Appliances CFC	**2013**	**30.00**	**30.00**	**---**	**---**
Appliances Non-CFC	**2013**	**10.00**	**10.00**	**---**	**---**
Unsecured loads	**2013**	**25.00**	**25.00**	**---**	**---**

The proposed 2017-2018 rate of $137.75 per ton is lower than projected in the last rate proposal (**Figure** 1). It is in line with rates for comparable solid waste providers in the

region – lower than Pierce County and Seattle, but higher than Snohomish County (**Table 2**).

Figure 1: 2017-2018 Rate proposal compared to 2013-2014 rate proposal projections

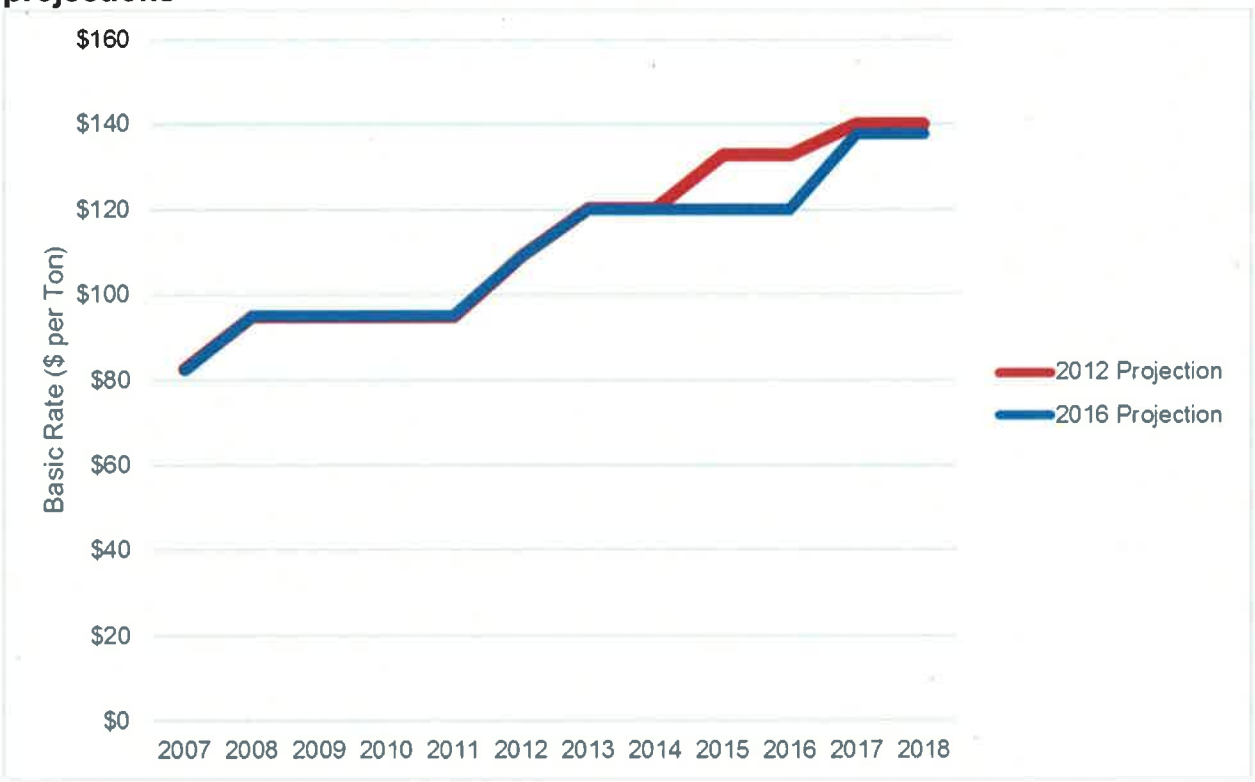


Table 2: Proposed King County solid waste fee compared to peer jurisdictions

Jurisdiction	**Basic Fee**[1]
Clark County	$87.56
King County proposed	$137.75
Pierce County	$145.84
Seattle City	$145.00
Snohomish County	$105.00
Spokane County (includes city)	$101.00
Thurston County	$119.00

[1] As of 2016

Financial Context

The division uses an enterprise fund, managing nearly all of its expenses with revenues earned through fees (called tipping fees) paid for disposal of waste at its transfer facilities and Cedar Hills. Services supported by the fees include:

- Transfer - Build and operate convenient and efficient transfer stations and drop boxes where many small loads of waste and recyclables are combined into larger loads. Transport waste from stations to Cedar Hills.
- Disposal - Develop and operate Cedar Hills where more than 880,000 tons of solid waste is disposed each year and landfill gas is used to produce energy and fuel. Monitor and maintain seven closed landfills to meet regulatory requirements.
- Recycling - Conduct waste prevention and recycling programs for curbside customers and at transfer stations to protect the environment and quality of life.
- Support Services - Meet customer needs and provide support functions needed to operate the solid waste system including human resources, finance, and system-wide planning.

Beginning in late 2007, a nationwide financial crisis triggered a precipitous, years-long decline in the amount of waste being disposed. Tonnage and rate revenue declined substantially, resulting in service reductions including suspension of recycling services at transfer stations, delaying regular facility maintenance, and deferring equipment replacement, in a bid to reduce expenses and mitigate a need to increase rates.

A rate increase that partially restored service and maintenance levels was adopted for 2013-2014, with a second increase planned for 2015-2016. By pursuing further efficiencies, the division was able to manage a seven percent increase in waste tonnage, wage and services inflation, and new debt service for transfer station construction without the planned 2015-2016 rate increase. Had rates increased as planned in 2015, customers would have paid $22 million more during the 2015-2016 biennium. A fee increase can no longer be deferred if the division is to sustain its current services, enhance service reliability, and keep up with a rapidly changing industry.

Additional revenue from the fee increase will sustain current services, ensure service reliability, fund county strategic priorities, and position the division for the future. The rate proposal also accounts for the County's increasing recycling rate which is projected to reduce solid waste disposal tons and associated disposal fees. **Error! Reference source not found.** summarizes the projected spending, per ton rate impact, and new required positions related to the rate proposal. In total, the rate proposal will increase

the basic fee by $17.58 per ton from $120.17 to $137.75 with approximately 80 percent of the rate increase directed to fund the rising costs of current services.

Table 3: Components of 2017-2018 Rate Increase

	2017-18 Expenditures ($ in millions)	2017-2018 Rate Impact ($ per ton)	New FTEs/TLTs required
Current Basic Fee		$120.17	
Sustain Current Services			
Cover Inflationary Increases	$12.5 M	$5.49	10.25 / 0
Debt Service for New Transfer Stations	$7.1 M	$3.10	
Replace Aging Equipment	$ 6.8 M	$2.98	
Fortify Cedar Hills Landfill Reserve Fund	$3.6 M	$1.59	
Maintain Closed Landfills	$2.5 M	$1.07	
Subtotal Sustain Current Services	*$32.5 M*	*$14.23*	*10.25 / 0*
Ensure Service Reliability	$3.6 M	$1.58	1 / 3
Address County Strategic Priorities	$1.1 M	$0.46	1 / 0
Position for the Future	$2.0 M	$0.88	0 / 10
Adjustment for Increased Recycling Rate	$0.7 M	$0.43	
Total		**$137.75**	**12.25 / 13**

The new spending categories within the 2017-2018 rate proposal include:

Sustain Current Services by funding current services and their increased cost including waste disposal at the Cedar Hills Regional Landfill, operation of eight transfer stations and two drop boxes, maintenance of closed landfills, waste prevention and recycling programs, and paying for support services (such as human resources, finance, and system wide planning) that are fundamental to system operations. Functions and projects include:

- **Cover Inflationary Increases.** Pay primarily for inflationary increases in division activities, rent, taxes, insurance, FTEs required to process increased tonnage and other factors.
- **Debt Service for New Transfer Stations** including the new Factoria transfer station, the planned South County transfer station, and other projects. Construction of new recycling and transfer stations is financed through General Obligation (GO) bonds. The new Factoria and South County stations will be under development during the 2017-2018 rate period, in accordance

with the 2006 Solid Waste Transfer Plan. No funding is allocated for a new Northeast Station, which remains an option for 2019 or beyond.

- **Replace Aging Equipment.** Begin to catch up on replacing equipment through the Capital Equipment Recovery Fund. The rate proposal will allow the division to accelerate replacement of equipment to normal life-cycles, reduce ongoing maintenance costs, and improve efficiency of the waste management system.
- **Fortify Cedar Hills Landfill Reserve Fund.** Increase the contribution to pay for landfill capacity to meet disposal needs into 2027, and maintain sufficient balances to meet regulatory requirements. As approved in the *2010 Cedar Hills Site Development Plan*, new disposal capacity called Area 8 is being developed. To cover increased landfill development costs associated with development of Area 8 and to maintain reserve funding requirements, contributions to the Landfill Reserve Fund need to increase from the amount in the last rate proposal.
- **Maintain Closed Landfills.** Pay for ongoing monitoring and maintenance of 7 closed landfills to meet regulatory requirements. Current federal and state regulations prescribe a strict monitoring and maintenance regime for up to 30 years after a landfill closes. Funds for monitoring and maintenance during the regulatory period must be set aside in the landfill Post-Closure Maintenance Fund (PCMF). Six of the seven closed landfills that the division monitors and maintains are beyond the regulatory period during which funds must be set aside in a separate fund. However, pollutants at those sites still exceed levels at which monitoring can be discontinued. There is no known date when monitoring and maintenance will no longer be necessary. Funds to monitor and maintain closed landfills that are beyond their regulatory period are included as an ongoing operational cost and are increased from the last rate proposal

Ensure Service Reliability by funding upgrades to the transfer station cashiering system; new rate structure to sustain revenue while recycling rates increase; improving wastewater systems at Cedar Hills to ensure continued regulatory compliance; purchasing an additional tipper; and other means.

Address County Strategic Priorities by funding efforts to implement Equity and Social Justice (opportunity fund); Best Run Government (employee engagement and business planning); and Strategic Climate Action Plan (compressed natural gas pilot project study) initiatives.

Position for the Future by funding a transfer station demand management pilot program in 2018 to explore methods for reducing customer wait times, encouraging use of stations during off-peak hours, and shifting use to less busy stations.

Demand management strives to make better use of existing transfer stations by moving customers more swiftly through the station or reducing the number of customers in a

station at one time. Analytical models have been developed to explore methods for reducing customer wait times, encouraging use of stations during off-peak hours, and shifting use to less busy stations. The proposed rate includes a 2018 demand management pilot project to test the practical effectiveness of the modeled actions at urban transfer stations. If the demand management pilot program meets its end goals, it could alleviate the pressure to build new transfer stations or, alternatively, reduce the costs of new facilities currently estimated at $97 million, reducing future rate increases.

Consistent with the modeling results of a 2015 transfer station study, the scope of the demand management pilot program focuses on the Factoria and Shoreline Recycling and Transfer Stations. The pilot project would run for 12 months beginning in 2018. During the pilot project, the per-ton fee for self-haulers at the Factoria station would be increased during peak hours on weekdays and on weekends. The current assumed peak hours are a four-hour period between 11 a.m. and 3 p.m. Operating hours would be extended on weekdays until 10 p.m. and on weekends until 7:30 p.m.. Additionally, temporary staff would be added to assist customers at the Shoreline station. The use of the Houghton station during the pilot remains under evaluation.

The Metropolitan Solid Waste Management Advisory Committee (MSWMAC) suggested that demand management be tested at all urban stations for a 12-month period to provide an equitable distribution of potential impacts of the pilot measures to the County solid waste system users. While the proposed scope for the pilot project will not affect all transfer stations, it is designed to provide information on equity, service levels and effectiveness that may be incorporated at other stations in the future. Adding additional stations to the pilot is possible, however, it would present a significant cost increase to the study and may not add significant benefit to the ability to evaluate the measures.

Revenue from peak pricing was not included in this rate proposal due to the uncertainty of the pilot results at this time. Following the conclusion of the pilot in 2018, the division will evaluate the effectiveness of demand management and consider including peak pricing revenue in future rate proposals.

Additional Regular and Temporary Positions

The proposed rate increase will fund 12.25 FTEs and 13 temporary TLT positions for a total of 25.25 new positions in 2017-2018. Many of the new positions (10 TLTs) will be assigned to the demand management pilot program. An additional 10.25 positions will provide additional support at transfer stations and for transportation services to respond to increased solid waste tonnage, new station design and expanded recycling services. Two FTE positions and one TLT position would support new stormwater engineering requirements, county strategic priorities related to improved employee engagement and business planning, and the division's planned rate restructure. Two TLT positions will be added to manage the post-closure landfills and Cedar Hills landfill capital projects.

Determining the Rate

The basic fee is calculated using the tonnage forecast, projected costs, projections of revenue from all sources (including the fund balance), and fund balance requirements. The rate model comprises five economic and financial components:

- Tonnage
- Landfill Reserve Fund
- Construction
- Capital Equipment Recovery Program
- Operating Fund

Fees are calculated to ensure that revenues are sufficient to reliably:

- Cover the cost of operations and services,
- Fund capital investment projects and landfill closure and maintenance, and
- Maintain a target Operating Fund balance.

The division's expenditures over the rate period are estimated, including operating and support service costs and transfers to reserve funds. Anticipated revenues from all non-fee sources, such as grants, interest income, landfill gas sales, and available fund balance are subtracted from the total expenditures to arrive at the fee revenue that will be needed to support the system over the rate period. That amount is divided by the forecasted tonnage to determine a per-ton basic fee. Other fees are determined using both the basic fee as a foundation and factors specific to the fee categories. The fee is then adjusted to account for non-tip fee revenue and use of available fund balance for a final basic fee.

Financial Assumptions

Key financial assumptions in the division's rate model include inflation, interest, and the potential date of closure for Cedar Hills. Forecasts for inflation are used in the rate model to help estimate future operational and capital costs, while forecasts for interest earnings are used to calculate revenue that will be earned on fund balances. For more information, see http://www.kingcounty.gov/business/Forecasting/Forecasts.aspx.

Table 4: Financial Assumptions

Projected Wage and Services Inflation (OEFA March 2016 CPI-U Forecast)

2017	2018	2019	2020	2021	2022	2023	2024	2025	2026 to 2040
2.41%	2.71%	2.72%	3.01%	3.06%	3.04%	2.98%	2.96%	2.91%	2.50%

Projected Investment Pool Nominal Rate of Return (OEFA March 2016 CPI-U Forecast)

2017	2018	2019	2020	2021	2022	2023	2024	2025	2026 to 2040

0.80%	1.10%	1.52%	2.07%	2.50%	2.83%	3.08%	3.28%	3.44%	3.00%

The closure date for Cedar Hills determines how much time is available to collect the required funds in the LRF for thirty years of post-closure maintenance. Under current policy, Cedar Hills will close in 2027.

Tonnage Forecast

A fundamental input to the rate model is the projected amount of waste that will be disposed at division facilities during the rate period. The tonnage forecast predicts waste generation over a 20-year period. The forecast relies on established statistical relationships between waste generation and economic and demographic variables that affect it, such as population, employment rates, and income. Although 2016 has started strong, tonnage is expected to decrease when the City of Seattle reopens its North Transfer and Recycling facility sometime this year. Over time, increased waste generation will replace tonnage lost to the Seattle system, returning to current levels by 2019 (Table 1, Appendix A).

Increases in the recycling rate (forecast to reach 57 percent by 2018) will slow increases in waste tonnage. Resource recovery (recycling that takes place after waste is delivered to division transfer stations) is expected to increase dramatically as new recycling and transfer stations are built with the ability to handle more recyclable materials and station-based resource recovery is expanded. Increased curbside recycling is expected in response to new programs. Appendix A describes the tonnage forecasting process and gives the tonnage forecast through 2036.

Table 5: 2017-2018 tonnage forecast by site

Transfer Station	2017	2018
Factoria	122,230	122,424
Houghton	153,495	153,740
Renton	66,049	66,154
Algona	143,138	143,367
Bow Lake	244,459	244,849
Shoreline	52,098	52,181
Enumclaw	21,593	21,627
Vashon	7,328	7,340

Cedar Falls Drop Box	3,811	3,817
Skykomish[2]	1,100	1,100
Subtotal	**810,467**	**811,759**
Cedar Hills Regional Direct		
Regional Direct	6,500	6,500
Special Waste	1,500	1,500
Other Waste	19,000	19,000
Subtotal	27,000	27,000
Total Disposed	**837,467**	**838,759**
Yard waste (transferred to a composting facility)	13,500	16,500

Revenue Projections

The division generates about 95 percent of its revenues from tipping fees collected at its transfer facilities and Cedar Hills. Most of the remaining five percent is received from the Local Hazardous Waste Management Program (LHWMP), which pays for the handling of household hazardous waste. Other minor revenue sources include:

- Interest earned on fund balances,
- Income from rental properties,
- Fees for construction and demolition waste,
- Revenue from the sale of recyclable materials received at division transfer facilities,
- Fees on recyclables collected in unincorporated areas,
- Grants to help clean up litter and illegal dumping and to support waste prevention and recycling,
- Revenue from the sale of landfill gas from Cedar Hills.

Revenue from most sources can vary considerably due to economic and market conditions.

[2] Solid waste collected at the Skykomish drop box is transported to the Houghton transfer station for disposal. Projected tons for Skykomish are shown for illustrative purposes, but are counted in the Houghton tonnage figures.

Expenditure Projections

The division's annual spending over the planning horizon is estimated based on operational factors as well as forecasts for inflation, which are consistent with other County agencies. Expenditures can be divided into broad categories: operating costs, recycling programs, support service costs, debt service, and transfers to other funds.

Operating Costs: Disposal and Transfer

Operating costs, the day-to-day expenses for transfer, transport, and landfill operations, constitute the majority of all division spending. Maintenance of equipment and facilities, management of landfill gas and wastewater, business and occupation (B&O) tax, and Cedar Hills' rent are also included here.

Recycling

This includes grants to the cities and other division waste prevention and recycling programs.

Support Services

This cost category includes functions that support direct services, such as engineering, finance, management, and system-wide planning.

Debt Service

Debt service is the payment of interest and principal on bonds and loans. GO bonds backed by the full faith and credit of the county's General Fund have been issued to pay for development of major transfer facility capital projects. It is anticipated that with approval of the King County Council, GO bonds will continue to be issued for transfer facility capital projects. More information on the Capital Improvement Program is provided in Appendix C: Capital Improvement Program. Capital projects at Cedar Hills are not funded through debt financing, but through the LRF.

Transfers to Other Funds

Transfers from the Solid Waste Operating Fund to reserve funds were established to ensure that the division can meet future expenses, including those mandated by law. Contributions to reserve funds are routinely evaluated to ensure that they are adequate to meet short- and long-term needs. Paying into reserve funds stabilizes the impact of certain expenses on rates by spreading the costs over a longer time period and ensures that customers who use the system pay the entire cost of disposal. The four reserve funds are discussed below.

Construction Fund

The division deposits bond proceeds and contributions from the operating fund into the construction fund to finance new construction and major maintenance of properties owned by the division. Contributions from the operating fund reduce the need to borrow.

Capital Equipment Recovery Program

The CERP is codified in KCC 4.08.280. Its purpose is to provide adequate resources for replacement and major maintenance of solid waste rolling stock (primarily hauling trucks

and trailers) and compactors. New equipment is purchased from the operating fund, but after the initial purchase, replacements are funded from the CERP.

By accumulating funds in the CERP, the division ensures that it is able to cover the variable expenditures that come with replacing needed equipment even while revenue fluctuates. Contributions to the CERP are calculated by projecting future replacement costs, salvage values, and equipment life. Contributions are adjusted to reflect changes in facilities and operations that affect equipment needs. The contributions earn interest in an account until needed. The CERP is discussed in detail in Appendix D: Capital Equipment Recovery Program.

Landfill Reserve Fund
The LRF, codified in KCC 4.08.045, covers the costs of four major accounts maintained for Cedar Hills.

- The *new area development account* covers the costs for planning, designing, permitting, and building new disposal areas, ensuring sufficient funds for these capital projects.
- The *facility improvements account* covers a wide range of capital investments required to sustain landfill infrastructure and operations, such as the landfill gas and wastewater systems.
- Mandated by federal law, the *closure account* covers the cost of closing operating areas (cells) within the landfill that have reached capacity.
- The *post-closure maintenance account*, mandated by federal law, accumulates funds for 30 years of post-closure maintenance of Cedar Hills.

Post-Closure Maintenance Fund
In accordance with federal regulation 40 CFR 258.61, the PCMF pays for the maintenance and environmental monitoring of closed and custodial landfills in the county for thirty years after closure. Custodial landfills beyond their mandated post-closure period continue to be monitored and maintained through this fund until pollution levels drop below mandated levels. Once Cedar Hills closes, the balance of the LRF will be transferred to the PCM for Cedar Hills' 30-year closure care period.

Target Fund Balance
The current policy is to retain an average balance in the operating fund sufficient to cover 30 days of direct operating costs.

Appendix A: Tonnage Forecast Through 2036

Short-term Forecasting

Since 2007, there has been greater uncertainty and unpredictability in variables that inform the division's short-term (up to five years) forecast. The division's short-term forecasting method involves:

- Monitoring daily solid waste tons delivered to the division's facilities.
- Monitoring regional and state-wide economic forecasts (Dick Conway, King County economic forecast, Washington State Economic and Revenue Forecast Council).
- Monitoring state-wide tax revenue streams, particularly in the home improvement sector, furniture store sales, clothing sector, and other key markets.
- Communicating with other jurisdictions about trends in their service areas.

The information gained through these measures is used to forecast short-term tonnage and subsequent revenues for use in critical budgeting, expenditure control, and management of capital projects over the three-to-five year period. By the end of the 2017-2018 budget cycle there will be enough post-recession data to adjust the forecasting model to reflect any long-term changes resulting from the recession.

Long-term Forecasting

The planning forecast model to predict solid waste generation over the long-term (six to 20 years) relies on established statistical relationships between waste generation and various economic and demographic variables that affect it, such as:

- Population in the service area
- Employment rates
- Household size (persons/household)
- Per capita income (adjusted for inflation)

For the long-term planning forecast the following trends are expected:

- Population is expected to grow at a rate of 0.9 percent per year. Population growth is directly correlated with increased waste generation.
- Employment is expected to increase by 1.3 percent per year. Increased employment is generally accompanied by an increase in consumption and waste generation.
- Household size is expected to decrease by 0.3 percent per year. Since "household," regardless of the number of residents, implies a certain minimum level of maintenance, mail, purchasing, etc. A decrease in household size tends to increase waste generation per capita.
- Per capita income is expected to increase by 1.8 percent per year. As with employment activity, increases in income typically lead to an increase in spending, hence more consumption and more waste generation.

For additional information on long-term forecasting, see 2000 King County Comprehensive Solid Waste Management Plan, Technical Appendix (vol. I).

In response to the King County Auditor's report recommendations (2015), the division conducted sensitivity analyses around key assumptions that affect the long-term forecast trends, including changes to the recycling rate projection.

The tonnage forecast is developed in two steps, with waste disposal and waste diversion calculated separately. In the first step, an econometric model is used to relate historical data for waste disposal and recycling to past demographic and economic trends in the region. Once these relationships are established, the model can be used to project future waste generation based on expected trends over the planning period. This produces a baseline disposal forecast, which assumes that the percentage of waste recycled remains constant.

In the second step, goals for waste prevention and recycling are used to calculate how much additional material is expected to be diverted from disposal given the same demographic and economic trends. This information is then used to adjust the baseline forecast. Recycling data are provided by the curbside collection companies, the division's own transfer facilities, and annual surveys by the Washington State Department of Ecology. Table 1-A shows the tonnage forecast through 2036 (as of February 17, 2016).

Table 1-A Tonnage Forecast Through 2036

Year	Basic Fee Tons	Regional Direct	Special Waste	Tons Disposed	Yard Waste	Total System Tons
2015	861,621	6,384	1,797	869,802	11,723	881,525
2016	856,100	6,500	1,500	864,100	12,000	876,100
2017	829,467	6,500	1,500	837,467	13,500	850,967
2018	830,759	6,500	1,500	838,759	16,500	855,259
2019	853,700	6,500	1,500	861,700	16,500	878,200
2020	892,440	6,500	1,500	900,440	16,500	916,940
2021	923,737	6,500	1,500	931,737	16,500	948,237
2022	955,775	6,500	2,000	964,275	16,500	980,775
2023	984,579	6,500	2,000	993,079	16,500	1,009,579
2024	1,012,137	7,000	2,000	1,021,137	16,500	1,037,637
2025	1,037,527	7,000	2,000	1,046,527	16,500	1,063,027
2026	1,058,236	7,000	2,000	1,067,236	16,500	1,083,736
2027	1,079,391	7,000	2,000	1,088,391	16,500	1,104,891
2028	1,095,594	7,000	2,000	1,104,594	16,500	1,121,094

2029	1,084,134	7,000	2,000	1,093,134	16,500	1,109,634
2030	1,053,320	7,000	2,500	1,062,820	16,500	1,079,320
2031	1,067,169	7,000	2,500	1,076,669	16,500	1,093,169
2032	1,088,121	8,000	2,500	1,098,621	16,500	1,115,121
2033	1,104,791	8,000	2,500	1,115,291	16,500	1,131,791
2034	1,121,604	8,000	2,500	1,132,104	16,500	1,148,604
2035	1,138,603	8,000	2,500	1,149,103	16,500	1,165,603
2036	1,155,889	8,000	2,500	1,166,389	16,500	1,182,889

Appendix B: Rate Model Through 2036

	2015	2016	2017	2018	2019	2020	2021
Basic Fee	**120.17**	**120.17**	**137.75**	**137.75**	**142.00**	**142.00**	**145.00**
Total System Tons	881,525	876,100	850,967	855,259	878,200	916,940	948,237
Revenues							
Disposal Fees	105,553,760	104,865,887	116,461,232	116,889,485	123,957,116	129,454,499	136,759,235
Interest Earnings	177,968	262,350	238,837	214,029	241,587	275,460	284,859
Grants	250,000	250,000	213,000	213,000	215,897	219,146	222,499
Landfill Gas	1,873,000	1,873,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Recycling	563,024	403,024	-	-	-	-	-
Rental Incomes	716,790	1,372,440	620,873	625,783	625,783	625,783	644,932
C&D	50,000	200,000	677,195	696,157	696,157	696,157	717,459
Other Revenue	107,023	107,023	385,000	385,000	395,472	407,376	419,841
Total Revenue	**109,291,564**	**109,333,723**	**119,596,137**	**120,023,453**	**127,132,012**	**132,678,421**	**140,048,825**
Operating Expenditures							
Public Health Transfer	948,084	941,869	912,839	914,247	964,801	1,008,176	1,075,139
Capital program debt service	8,774,601	11,478,095	13,732,413	13,599,663	13,602,163	16,478,047	16,623,547
Landfill Reserve Fund	12,458,793	14,484,649	25,073,066	15,505,430	16,362,804	17,613,100	18,782,980
Capital Equipment Recovery Program	3,500,000	3,500,000	6,900,000	6,900,000	6,900,000	6,900,000	6,300,000
Construction Fund			3,000,000	-	-	-	1,000,000
Cedar Hills Rent	2,885,000	2,928,000	2,972,000	3,017,000	3,062,000	3,108,000	3,155,000
Post-closure Reserve Fund	-	-	1,225,000	1,225,000	1,258,320	1,296,195	1,335,859
City mitigation			22,080	22,715	460,680	496,572	530,104
CHRLF Environmental Liability Policy			405,000	415,976	427,290	440,151	453,620
Overhead / Fund Management	2,304,974	9,652,579	10,460,983	10,694,476	10,985,366	11,316,025	11,662,295
SWD Admin / SW Directors Office	7,032,331	939,001	981,631	1,011,080	1,041,412	1,072,655	1,104,834
Human Resources		1,054,460	1,079,872	1,109,137	1,139,306	1,173,599	1,209,511
Legal Support	452,014	552,014	565,318	580,638	596,431	614,384	633,184
P&C / Strategy, Comms & Performance	1,915,097	2,650,906	3,356,678	3,305,803	3,395,721	3,497,932	3,604,969
Finance & IT / Enterprise Services	7,357,412	3,801,335	4,121,544	4,233,238	4,348,382	4,479,268	4,616,334
Contract Management		435,984	446,491	458,591	471,065	485,244	500,092
Project Management		1,501,875	1,538,070	1,579,752	1,622,721	1,671,565	1,722,715
Recycling & Environmental Services	6,216,649	7,483,135	8,082,818	8,226,862	8,450,633	8,704,997	8,971,369
WPR City Grants	1,136,309	1,138,228	1,165,659	1,197,249	1,229,814	1,266,831	1,305,596
Engineering / Facility Engineering & Science	5,986,644	2,868,993	3,474,749	3,568,914	3,665,989	3,776,335	3,891,891
Transfer & Transport Operations	28,863,355	28,626,769	30,576,547	33,255,171	34,159,712	35,187,919	36,264,669
Disposal Operations	14,162,058	13,288,032	14,919,654	14,290,022	14,678,711	15,120,540	15,583,229
Waste Export							
B & O Tax	1,583,306	1,572,988	1,746,918	1,753,342	1,859,357	1,941,817	2,051,389
Total SWD Cost	**105,576,628**	**108,898,912**	**136,759,330**	**126,864,306**	**130,682,676**	**137,649,353**	**142,378,327**
Ending Fund Balance	36,663,779	38,555,692	22,984,586	17,790,008	15,930,452	12,701,529	12,167,329

Target Fund Balance (30-day reserve)	7,287,925	7,308,323	8,068,237	8,284,481	8,517,547	8,976,833	9,223,662
	2022	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
Basic Fee	**145.00**	**149.00**	**149.00**	**151.00**	**151.00**	**153.00**	**153.00**
Total System Tons	980,775	1,009,579	1,037,637	1,063,027	1,083,736	1,104,891	1,121,094
Revenues							
Disposal Fees	141,481,399	149,658,613	153,855,332	159,750,921	164,226,746	169,661,758	172,130,568
Interest Earnings	274,116	279,021	285,593	347,898	451,890	606,518	502,313
Grants	225,881	229,247	232,639	236,024	238,975	241,962	244,986
Landfill Gas	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Recycling	-	-	-	-	-	-	-
Rental Incomes	664,538	684,341	704,598	725,101			
C&D	739,270	761,300	783,835	806,645	826,811	847,481	868,668
Other Revenue	432,605	445,496	458,683	472,031	483,831	495,927	508,325
Total Revenue	**144,817,809**	**153,058,018**	**157,320,680**	**163,338,620**	**167,228,252**	**172,853,645**	**175,254,860**
Operating Expenditures							
Public Health Transfer	1,112,686	1,180,072	1,213,413	1,279,772	1,305,096	1,364,241	1,384,550
Capital program debt service	19,491,156	19,499,706	19,508,581	19,429,831	19,422,081	19,422,031	16,409,481
Landfill Reserve Fund	20,029,860	21,242,895	22,489,637	23,719,550	24,793,643	19,876,189	
Capital Equipment Recovery Program	6,300,000	6,100,000	6,100,000	4,100,000	4,100,000	4,100,000	4,100,000
Construction Fund	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Cedar Hills Rent	3,202,000	3,250,000	3,299,000	3,287,583			
Post-closure Reserve Fund	1,376,469	1,417,488	1,459,446	1,501,915	1,539,463	1,577,950	1,617,399
City mitigation	565,562	266,659	387,912	409,214	431,455	451,008	469,165
CHRLF Environmental Liability Policy	467,410	481,339	495,587	510,008	522,758	535,827	549,223
Overhead / Fund Management	12,016,829	12,374,931	12,741,229	13,111,998	13,439,798	13,775,793	14,120,188
SWD Admin / SW Directors Office	1,137,979	1,172,119	1,207,282	1,243,501	1,280,806	1,319,230	1,358,807
Human Resources 720129	1,246,280	1,283,419	1,321,408	1,359,861	1,393,858	1,428,704	1,464,422
Legal Support	652,432	671,875	691,762	711,893	729,690	747,932	766,631
Strategy, Comms. & Performance	3,714,560	3,825,253	3,938,481	4,053,091	4,154,418	4,258,278	4,364,735
Enterprise Services	4,756,671	4,898,419	5,043,413	5,190,176	5,319,930	5,452,929	5,589,252
Contract Management	515,295	530,651	546,358	562,257	576,314	590,721	605,490
Project Management	1,775,085	1,827,983	1,882,091	1,936,860	1,985,282	2,034,914	2,085,787
Recycling & Environmental Services	9,244,099	9,519,573	9,801,353	10,086,572	10,338,736	10,597,205	10,862,135
WPR City Grants	1,345,286	1,385,376	1,426,383	1,467,891	1,504,588	1,542,203	1,580,758
Facility Engineering & Science	4,010,205	4,129,709	4,251,948	4,375,680	4,485,072	4,597,198	4,712,128
Transfer & Transport Operations	37,367,115	38,480,655	39,619,683	40,772,615	41,791,931	42,836,729	43,907,647
Disposal Operations	16,056,959	16,535,456	17,024,906	17,520,330	17,958,339	14,116,735	
Waste Export						14,911,346	66,547,864
B & O Tax	2,122,221	2,244,879	2,307,830	2,396,264	2,463,401	2,544,926	2,581,959
Total SWD Costs	**149,506,160**	**153,318,457**	**157,757,701**	**160,026,863**	**160,536,660**	**169,082,090**	**186,077,619**
Ending Fund Balance	9,328,848	9,068,409	8,631,388	11,943,145	18,634,737	22,406,293	11,583,534

Target Fund Balance (30-day reserve)	9,696,448	9,913,417	10,165,332	10,401,843	10,346,453	11,441,028	14,462,632

	2029	2030	2031	2032	2033	2034	2035	2036
Basic Fee	**169.00**	**169.00**	**171.00**	**171.00**	**180.00**	**180.00**	**184.00**	**184.00**
Total System Tons	1,109,634	1,079,320	1,093,169	1,115,121	1,131,791	1,148,604	1,165,603	1,182,889
Revenues								
Disposal Fees	188,185,336	183,191,383	193,200,441	197,204,416	204,717,287	207,734,031	216,636,683	219,862,659
Interest Earnings	404,496	425,401	413,457	445,906	477,937	495,113	523,174	559,696
Grants	248,049	251,149	254,289	257,467	260,686	263,944	267,243	270,584
Landfill Gas	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Recycling	-	-	-	-	-	-	-	-
Rental Incomes								
C&D	890,385	912,644	935,460	958,847	982,818	1,007,388	1,032,573	1,058,387
Other Revenue	521,033	534,059	547,411	561,096	575,123	589,501	604,239	619,345
Total Revenue	**191,249,299**	**186,314,636**	**196,351,058**	**200,427,732**	**208,013,850**	**211,089,978**	**220,063,913**	**223,370,672**
Operating Expenditures								
Public Health Transfer	1,404,441	1,365,494	1,417,868	1,446,777	1,505,448	1,528,143	1,589,866	1,613,782
Capital program debt service	15,707,431	15,707,331	15,706,681	15,704,681	15,706,646	15,705,471	14,564,311	14,565,791
Landfill Reserve Fund								
Capital Equipment Recovery Program	2,200,000	2,200,000	2,200,000	2,200,000	2,300,000	2,300,000	2,300,000	2,300,000
Construction Fund	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,500,000	1,500,000
Cedar Hills Rent								
Post-closure Reserve Fund	1,657,834	1,699,279	1,741,761	1,785,305	1,829,938	1,875,687	1,922,579	1,970,643
City mitigation	475,905	474,275	492,466	515,070	535,957	557,638	580,161	603,611
CHRLF Environmental Liability Policy	562,954	577,027	591,453	606,239	621,395	636,930	652,854	669,175
Overhead / Fund Management	14,473,193	14,835,023	15,205,898	15,586,046	15,975,697	16,375,089	16,784,466	17,204,078
SWD Admin / SW Directors Office	1,399,571	1,441,558	1,484,805	1,529,349	1,575,229	1,622,486	1,671,161	1,721,296
Human Resources 720129	1,501,032	1,538,558	1,577,022	1,616,448	1,656,859	1,698,280	1,740,737	1,784,256
Legal Support	785,796	805,441	825,577	846,217	867,372	889,057	911,283	934,065
Strategy, Comms. & Performance	4,473,854	4,585,700	4,700,343	4,817,851	4,938,298	5,061,755	5,188,299	5,318,006
Enterprise Services	5,728,983	5,872,208	6,019,013	6,169,488	6,323,725	6,481,818	6,643,864	6,809,961
Contract Management	620,627	636,142	652,046	668,347	685,056	702,182	719,737	737,730
Project Management	2,137,931	2,191,380	2,246,164	2,302,318	2,359,876	2,418,873	2,479,345	2,541,328
Recycling & Environmental Services	11,133,688	11,412,030	11,697,331	11,989,764	12,289,509	12,596,746	12,911,665	13,234,457
WPR City Grants	1,620,277	1,660,784	1,702,303	1,744,861	1,788,482	1,833,194	1,879,024	1,926,000
Facility Engineering & Science	4,829,932	4,950,680	5,074,447	5,201,308	5,331,341	5,464,624	5,601,240	5,741,271
Transfer & Transport Operations	45,005,338	46,130,472	47,283,734	48,465,827	49,677,473	50,919,410	52,192,395	53,497,205
Disposal Operations								
Waste Export	67,503,885	67,272,713	69,853,001	73,059,195	76,021,934	79,097,163	82,291,984	85,618,153
B & O Tax	2,822,780	2,747,871	2,898,007	2,958,066	3,070,759	3,116,010	3,249,550	3,297,940
Total SWD Costs	**187,045,451**	**189,103,966**	**194,369,920**	**200,213,159**	**206,060,995**	**211,880,558**	**217,374,521**	**223,588,747**
Ending Fund Balance	15,787,382	12,998,052	14,979,190	15,193,763	17,146,618	16,356,039	19,045,431	18,827,355

Target Fund Balance (30-day reserve)	14,689,249	14,853,995	15,274,670	15,744,525	16,203,892	16,671,906	17,068,643	17,568,566

Appendix C: Capital Improvement Program

Summary

The Capital Improvement Program (CIP) funded by this rate continues implementation of the transfer system renovation plan as set forth in the collaboratively developed *2006 Solid Waste Transfer and Waste Management Plan* (*Transfer Plan*), which was approved by the King County Council in 2007. Since 2007, the division has altered the sizing and timing of projects due to tonnage changes and with consideration of potential rate impacts. Following the 2014 *Transfer Plan Review Part II* recommendations, the rate assumes no spending for a new Northeast Recycling and Transfer Station, which remains an option for 2019 and beyond. The division will examine demand management as a strategy to further minimize the need for CIP projects (**Error! Reference source not found.**.

Background

The division works with its advisory committees to determine how best to modernize the transfer system. As part of this process, the division completed construction of new recycling and transfer stations at Shoreline and at Bow Lake. These newer facilities provide more services while processing greater volumes of waste with less traffic congestion, easily accommodating modern garbage trucks and safely separating commercial traffic from self-haul customers. Flexible design ensures adaptability to changes in regional waste generation and in the solid waste industry for decades to come. The buildings achieved the highest possible rating for environmental design and construction – LEED Platinum.

The remaining urban transfer stations, built in the 1960s, are outdated and operating over capacity. The region has experienced major population growth. Commercial collection trucks are larger, making it difficult and inefficient to safely unload them at older transfer stations. Space constraints limit the number of recycling containers and the range of materials that each site can accommodate, resulting in disposal of recyclable materials like yard waste.

The division recently completed a resource recovery pilot project to remove recyclables from targeted garbage loads at the Shoreline Recycling and Transfer Station. Results indicate resource recovery is a cost-effective method for improving the recycling rate and making efficient use of the transfer stations. The division has expanded the resource recovery pilot to the Bow Lake and Enumclaw stations and will plan for integrating larger-scale resource recovery into the county system. Resource recovery at division facilities may not be enough to meet county goals and may require consideration of a dedicated new facility. The division and its partners are still evaluating how much new transfer capacity to build versus modifying service options and using existing stations more intensively.

Ongoing work of the CIP includes:

Factoria: The newly completed main recycling and transfer building at Factoria has begun operations. Deconstruction of the old transfer building will follow in 2016, with

project completion in 2017 with the opening of a new Household Hazardous Waste collection building.

South County: Environmental review under SEPA is ongoing for potential sites for the new facility.

The CIP also includes smaller projects, such as the removal of creosote pilings from the Duwamish River at the division's Harbor Island property, modernization of the environmental controls at the Duvall closed landfill, and replacement of stormwater pumps at Cedar Hills that are nearing the end of their useful life.

Table 1-C Capital Improvement Program - Revenues, expenditures, and fund balances

	2016	2017	2018	2019	2020	2021	2022	2023	2024
Interest earnings rate	0.70%	0.80%	1.10%	1.52%	2.07%	2.50%	2.83%	3.08%	3.28%
inflation	2.12%	2.41%	2.71%	2.72%	3.01%	3.06%	3.04%	2.98%	2.96%
cumulative inflation	2.12%	4.53%	7.24%	9.96%	12.97%	16.03%	19.07%	22.05%	25.01%
Beginning fund balance	36,957,193	16,779,970	33,674,623	29,366,836	22,641,637	28,141,546	(8,037,706)	11,368,177	12,484,003
Revenues									
Operating fund transfer		3,000,000	-	-	-	1,000,000	1,000,000	1,000,000	1,000,000
Interest earned	187,424	201,014	344,831	392,283	520,222	248,196	46,469	361,753	421,723
Borrowing - Bonds	-	32,000,000	-	-	40,000,000	-	40,000,000		
Other revenue			8,000,000						
Total	*187,424*	*35,201,014*	*8,344,831*	*392,283*	*40,520,222*	*1,248,196*	*41,046,469*	*1,361,753*	*1,421,723*
Expenditures (with applied inflation or cumulative inflation)									
Bow Lake	$12,538	-	-	-	-	-	-		
Factoria	16,942,959	11,935,935	919,750	156,812	-	-	-	-	-
South County	798,000	2,509,510	6,275,223	6,441,625	34,153,561	36,260,929	19,583,648	-	
Northeast									
Cedar Falls	257,375	602,205	-	-	-	-	-		
Harbor Island	370,000	213,346	3,035,216	-	-	-	-		
Algona deconstruction	-	-	-	-	22,620	297,064	1,818,126	-	
Other projects (placeholder after 2022)	631,775	309,000	318,270	218,545	225,102	231,855	238,810	245,927	253,206
Closed/custodial LF projects	1,352,000	2,736,365	2,104,159	300,500	619,030	637,601	-	-	
Total	*20,364,647*	*18,306,361*	*12,652,619*	*7,117,482*	*35,020,313*	*37,427,448*	*21,640,585*	*245,927*	*253,206*
Ending fund balance	**16,779,970**	**33,674,623**	**29,366,836**	**22,641,637**	**28,141,546**	**(8,037,706)**	**11,368,177**	**12,484,003**	**13,652,519**

Appendix D: Capital Equipment Recovery Program

The division's CERP model applies life-cycle costing considerations to the division's capital equipment and is used to determine the timing of asset replacement. The CERP fund was codified in 1981 (KCC 4.08.280) to ensure the timely and economical replacement of equipment. The fund serves three main purposes:

- Accumulate the financial resources for the replacement of the division's rolling stock and stationary compactors on a timely and cost-effective basis;
- Stabilize the monetary effects of equipment purchases on the operating fund; and
- Provide stability in the operating budget against the effects of dramatic tonnage decreases.

CERP Inventory

By code, the CERP fund explicitly includes the division's "rolling stock and stationary compactors." However, since the establishment of the CERP fund, business practice and equipment technology have advanced and the division's capital equipment now includes significant fixed assets that are not "rolling stock" or "stationary compactors," but that do have direct operational use, such as power units for the landfill tippers. These major assets are included in the CERP model.

CERP Fund

New equipment is purchased from the division's operating fund. After the initial acquisition, an annual contribution is made to the CERP fund for the eventual replacement or major overhaul in lieu of replacement. All auction, salvage, and buyback income from disposal of division equipment is treated as CERP fund revenue.

CERP Fund Contributions

For each CERP inventory asset, an annual payment to the CERP fund is calculated based on assumptions about the asset's life and net future replacement cost (total estimated replacement cost minus estimated salvage/trade-in/buyback income). These annual payments ensure that adequate funds are available to purchase the replacement for that piece of equipment in the scheduled year.

Funding Policy

Since 2012, the division has based contributions to the CERP on a four-year average of the estimated replacement value of equipment due to be replaced within that timeframe. The estimated replacement value is adjusted for capitalized repairs and factors for inflation and salvage value. The fund balance is maintained between 15 percent and 20 percent of total CERP inventory replacement value. Contributions rise and fall based on expected expenditures, which would increase by 75 percent in 2017 if the division is to bring all capital equipment back into normal lifecycles.

Budgeting

Budget planning for equipment purchases, rebuilds, and replacements occurs early each year. Since the 2007, the division has deferred CERP spending wherever possible, a strategy that is no longer sustainable.

Budget planning for CERP is primarily focused on plans for the following year's budget request. However, it may include the review of purchase plans for the current year's adopted budget and a look ahead to the purchase of some items that can require up to two years' lead-time.

The initial purchase of a new asset (expansion of fleet or new type that is not replacing an outgoing asset) and all equipment repair costs are paid from the operating fund. CERP only pays to replace or rebuild existing equipment.

Life-Cycle Costing Model

The model used for life-cycle costing analysis is a Mean Annual Cost Equivalent (MACE) model, based on one published by the American Public Works Association.

The main components of the SWD MACE Model are:

- Interest rate and inflation assumptions
- Purchase/In-Service dates
- Estimated lifespan
- Estimated salvage values
- Repair and maintenance costs
- Meter readings

Interest and inflation rates are obtained from King County's Office of Economic and Financial Analysis (OEFA). All other equipment data is obtained from the division's CCG Faster database. The use of the CCG Faster software, and therefore accumulation of equipment history data, began in February 2003. Cost and usage data of equipment acquired and placed in service prior to this date, which represents 48 percent of the total inventory, is not represented.

MACE Model Function

The goal of using MACE in the economics of equipment replacement is to minimize the total costs of ownership. MACE considers the alternative-use or time value of money; a dollar spent ten years from now is not equivalent to a dollar spent today. This permits comparisons of alternatives that cover multiple time frames; it reduces expenditures over time to values which can be easily compared. For example, discounting permits comparison of a two-year replacement cycle with a four-year cycle.

This model is focused on yearly periods and because of the discount factor, it can be used for mileage or hour usage if these are converted to time equivalents.

The best estimates available are incorporated in the use of this model.

NOTE: MACER means the mean annual cost equivalent for replacement period R. See formula below.

$$MACE_R = \left[P - \frac{S_R}{(1+i)^R} + \sum_{t=1}^{R} \frac{X_t}{(1+i)^t} \right] \left[\frac{i\,(1+i)^R}{(1+i)^R - 1} \right]$$

where: i = discount rate

P = purchase price at t=0

t = year (numeral indicator)

S = resale or salvage value

R = year of replacement

X = sum of the year's costs (excluding depreciation, alternative cost of capital and inflation)

Asset Life Expectancies

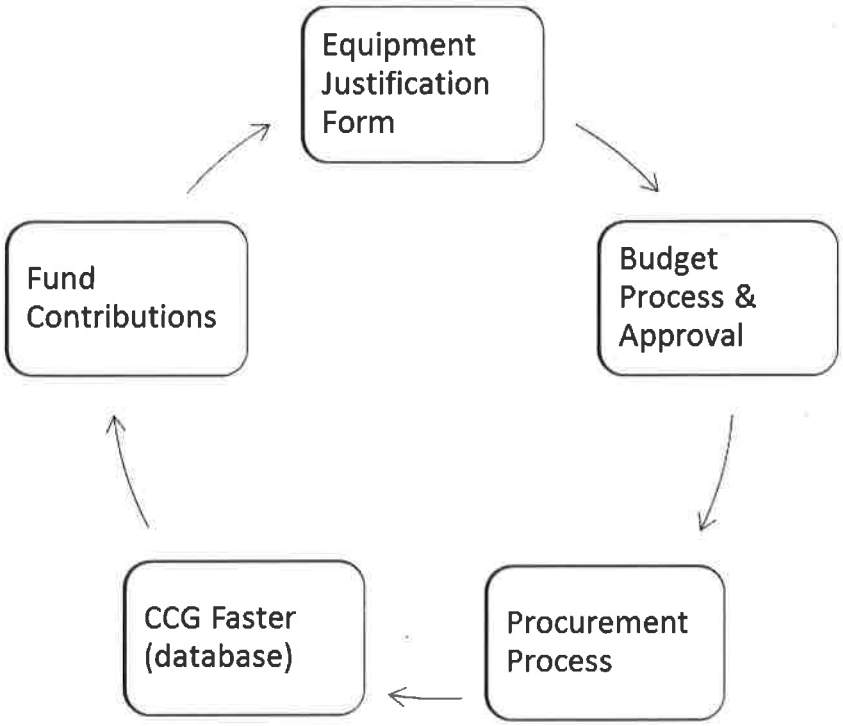
An asset's life expectancy is based on the Original Equipment Manufacturer (OEM) suggested life, which is then adjusted for the division's working conditions and consideration of MACE for that asset. For example, a long-haul tractor's OEM suggested life is one million miles for normal usage. However, the division's use of this type of vehicle is short-haul with heavy urban traffic, plus regular off-road driving at Cedar Hills. Based on assessment of the model for life-cycle costs and actual annual usage of 40,000 miles, the division's life expectance for long-haul tractors is about 400,000 miles or 10 years.

Some assets may be rebuilt, which will extend their life beyond the OEM suggested life. For example, the original life expectation for a bulldozer is 10,000 hours or 60 months; the expected life extension for a power train overhaul is 10,000 hours, or an additional 60 months. Other assets expected to have an extended life after rebuild work are excavators, refuse trailers, pre-load compactors, and hydraulic power units for tippers. Rebuilding a piece of equipment a second time has not proven cost-effective for extending useful life and, as a result, the division is resetting many of the units to historical replacement schedules.

CERP Process

The division's CERP manual documents processes, procedure, and definitions. The figure below summarizes the process for inventory purchase and replacement.

Figure 1-E: CERP Inventory Purchase and Replacement Process



Appendix E: Landfill Development and Reserve Fund

Table 1-F. Average per ton contribution by account 2017

New area development	$ 5.92
Facility improvements	$ 2.08
Closure	$ 6.52
Post-closure	$ 3.48
Total	**$ 18.00**

Table 2-F. Total landfill reserve fund

Year	Status	Cedar Hills Disposal Tonnage	Revenue[3]	Expenditures	Year-end Balance
2016	budgeted	864,100	14,088,081	28,444,784	26,810,229
2017	forecast	837,467	24,623,584	18,761,050	32,672,763
2018	forecast	838,759	14,679,617	20,910,302	26,442,078
2019	forecast	861,700	15,223,682	8,902,236	32,763,524
2020	forecast	900,440	16,042,937	27,210,281	21,596,180
2021	forecast	931,737	16,721,827	14,285,831	24,032,177
2022	forecast	964,275	17,390,982	6,161,766	35,261,393
2023	forecast	993,079	18,039,143	5,756,383	47,544,153
2024	forecast	1,021,137	18,717,799	2,336,518	63,925,435
2025	forecast	1,046,527	19,389,916	4,614,283	78,701,068
2026	forecast	1,067,236	19,878,382	4,862,757	93,716,693
2027	forecast	834,698	15,783,188	7,599,598	101,900,283
2028	closing		700,749	21,177,244	81,423,789
2029	closed		610,936	309,285	81,725,440[4]

[3] Interest revenue is based on the King County Auditor's report recommendation (2011).

[4] Ending balance will be transferred to the Post-Closure Maintenance Fund for ongoing monitoring and maintenance.