

# Tiered Rate Structure Analysis for Solid Waste

for the

**Grant County Solid Waste Department**



**December 2009**

**Final Report**





## Grant County Tiered Rate Structure Analysis for Solid Waste—Table of Contents

<b>Introduction.....</b>	<b>1</b>
<b>Key Findings.....</b>	<b>2</b>
Legal and Technical Feasibility .....	2
Waste Quantities and Composition.....	2
Analysis of Alternative Rates .....	2
<b>I. Review of Legal and Technical Feasibility.....</b>	<b>3</b>
Methodology .....	3
Legal Feasibility Review Findings.....	3
Technical Feasibility Findings .....	5
Summary of Legal and Technical Feasibility Review .....	6
<b>II. Quantity of Recyclables and Compostables Disposed .....</b>	<b>7</b>
Methodology .....	7
Quantity Estimate Findings .....	8
<b>III. Economic Analysis of Alternative Tip Fees.....</b>	<b>11</b>
Methodology .....	11
Economic Analysis Findings .....	16
Summary of Economic Analysis of Tip Fees.....	20
<b>Summary and Next Steps .....</b>	<b>21</b>
<b>Attachment A. Additional Options.....</b>	<b>22</b>
1. Free Drop-off for Clean Green Yard Trimmings .....	22
2. Surcharge on Loads with High Recyclable Paper or Organics Content .....	24
3. Require Cities to Provide Embedded Organics Collection for Residents .....	26
Summary of Options.....	28
<b>Attachment B. Detailed Quantity Findings.....</b>	<b>30</b>



## Introduction

Grant County is considering establishing a tiered rate structure for solid waste tip fees to extend the life of the Ephrata Landfill. A tiered rate structure is intended to increase diversion from the landfill through expanded recycling and composting. A tiered rate structure would establish a lower fee for waste from customers or jurisdictions that participate in recycling or composting, while the landfill would charge a higher tip fee for customers or jurisdictions that do not recycle or compost.

In 2009, Grant County hired Pickets Engineering, Cascadia Consulting Group, and Sound Resource Management to assess the key issues associated with a tiered rate structure, including legal and technical feasibility, quantities of recyclable and compostable materials currently disposed in the landfill, and the alternative tip fees required to create an incentive for diversion. This report summarizes our findings in the following sections.

- **Key Findings**
- **Review of Legal and Technical Feasibility**
- **Quantity of Recyclable and Compostable Materials Disposed**
- **Economic Analysis of Alternative Tip Fees**
- **Summary and Next Steps**
- **Attachment A: Additional Options**
- **Attachment B: Detailed Quantity Findings**

## Key Findings

### Legal and Technical Feasibility

The legal feasibility review found neither clear limitations nor clear authorization to set tip fees based on recycling and composting participation. However, the current billing system and hauler routes pose technical difficulties. Interviews and internet research resulted in the following findings:

- Solid waste tip fees are commonly structured based on waste volume and material type.
- Research did not identify a landfill applying rates based on recycling participation.
- One landfill elsewhere banned waste based on recycling, but the precedent has not been fully tested in court.

*Please note that Cascadia summarized research and interview findings but cannot provide legal advice.*

### Waste Quantities and Composition

Overall, up to 43 percent of materials currently disposed in the Ephrata Landfill could be diverted. Annual amounts disposed are estimated as follows:

- 14,800 tons of recyclables.
- 8,600 tons of yard waste.
- 15,300 tons of food waste.

### Analysis of Alternative Rates

Given the current relatively low tip fees, Grant County could not offer sufficient “credits” to provide the economic incentives required to implement new recycling and composting collection programs. That is, the credits could not be made high enough to offset the costs of recycling or composting to enable customers to “break even” financially. Breaking even financially means that the extra cost of recycling or composting is offset by an equal reduction in garbage costs. For residential and commercial customers to break even, making recycling or composting a cost-effective alternative, the tip fees would need to increase dramatically:

- **City residential**—at least a 40 percent increase, and more likely greater than 150 percent.
- **Rural residential**—more than a 200 percent increase.
- **Commercial**—no increase is needed for some customers; a 25 percent increase would be needed for some; and others would require more than a 100 percent increase.

Grant County could pay for free or reduced-fee yard waste drop-off with a relatively small increase in the garbage tip fee, depending on the quantity of material captured. The increase is estimated at \$2 to \$3 per ton for yard waste currently disposed by self-haul customers and \$5 to \$8 per ton if all the yard waste currently disposed were diverted.

## I. Review of Legal and Technical Feasibility

To identify potential legal and technical barriers to a tiered rate structure, Cascadia conducted key informant interviews and internet research to address the following questions:

- Does a tiered rate structure appear to be limited by state or federal law?
- Are there precedents in other jurisdictions?
- What are the technical barriers to a tiered rate structure?

*Please note that Cascadia summarized research and interview findings but cannot provide legal advice.*

### Methodology

Cascadia obtained information from the following industry professionals, regulatory agency officials, and representatives of jurisdictions and other organizations.

- Sheila Gall, Association of Washington Cities
- Janice Goeden, Ephrata Landfill (Grant County)
- Penny Ingram, Washington Utilities and Transportation Commission
- Brad Lovaas, Washington Refuse and Recycling Association
- Wayne Kraft, Department of Ecology
- Scott Merriman, Washington State Association of Counties
- Chaz Miller, National Solid Wastes Management Association
- Gretchen Newman, Department of Ecology
- Tamara Thomas, P.E., Terre-Source, LLC
- Steve Wamback, Pierce County and State Solid Waste Advisory Committee
- Mark Wash, Consolidated Disposal Service, Inc. (CDSI)

Internet research included searches for policies and rate structure models elsewhere, relevant reports available online, state laws, and court cases. Search terms included *solid waste, landfill, rate, fee, surcharge, recycling, composting, flow control, green waste, yard waste, Arlington (Oregon), and Ohio*. Online resources included the *Revised Code of Washington* as well as policies and studies from El Dorado and Riverside counties, California; Chicago, Illinois; Concord, Massachusetts; the State of Ohio; the State of Rhode Island; Seattle and Tacoma, Washington; and the U.S. Environmental Protection Agency.

### Legal Feasibility Review Findings

Grant County requested a study of a tiered rate structure that would apply different waste disposal tip fees based on whether customers or jurisdictions participated in diversion. The legal feasibility for establishing such a rate structure is unclear. The *Revised Code of Washington* provides no clear guidance, and key informants were not aware of explicit limitations in either state or federal law. Most court cases that address landfills and tip fees are related to flow control based solely on geography (e.g.,

in-state versus out-of-state waste), rather than on the level of recycling rates or the provision of recycling services. Municipalities elsewhere also offered little guidance and few precedents. Most tiered rate structures are based on the volume of waste and its material composition. One solid waste management district in Ohio banned waste from other Ohio jurisdictions that achieved lower recycling rates or offered fewer recycling services, but the rule did not address a tiered rate structure and was not fully tested in court. Landfill fee structures reviewed mainly assessed charges based on the quantity and type of material disposed.

### *Washington State Law*

The *Revised Code of Washington* provides little apparent guidance or limitations on allowable tip fees. According to state law, a county can establish rates and charges for its solid waste handling system and facilities. As RCW 36.58 states, “A county may construct, lease, purchase, acquire, add to, alter, or extend solid waste handling systems, plants, sites, or other facilities and shall have full jurisdiction and authority to manage, regulate, maintain, utilize, operate, control, and establish the rates and charges for those solid waste handling systems, plants, sites, or other facilities.” A subsection, RCW 36.58A, allows a county to establish solid waste collection districts with mandatory collection, with certain limits. In addition, RCW 70.95 authorizes a county to define service levels for waste reduction and recycling in its solid waste management plan.

Cascadia did not find guidance in Washington State law for the underlying principle that counties should use to establish solid waste rates. For comparison, Cascadia looked at references in state law to rates for other public works services. In setting rates for *wastewater*, for example, utilities must treat like customers alike but can set rates to encourage conservation. Specifically, wastewater utilities can set rates based on the quantity and quality of services provided, the achievement of water conservation goals, and “any other matters which present a reasonable difference as a ground for distinction.”

### *Flow Control Cases*

Most court cases related to solid waste fees and landfills address attempts to control the flow of waste—either by directing local waste to the local landfill or by restricting the in-flow of waste from outside the state or county. According to the U.S. Supreme Court’s interpretation of the Interstate Commerce Clause of the U.S. Constitution in numerous court cases, jurisdictions cannot restrict the flow of waste from other states based solely on location of origin.

In *Oregon Waste System v. Department of Environmental Quality* (1994), the Supreme Court ruled that the State of Oregon could not impose a surcharge on out-of-state waste when such a fee is based solely on the location of origin rather than on a characteristic of the waste that actually imposes a higher cost on the state. Similarly, in *Fort Gratiot Sanitary Landfill Inc. v. Michigan Department of Natural Resources* (1992), the Supreme Court ruled that a county in Michigan could not ban waste from outside the county from entering its landfill. Because such a ban would necessarily also exclude waste from outside the *state*, the Court considered it an illegal restriction of interstate commerce.

The legal feasibility review revealed one case in which the import of waste was restricted based on the recycling characteristics of the source county. The Stark-Tuscarawas-Wayne Solid Waste Management District in Ohio *banned* waste from counties with lower recycling rates or recycling service levels. While the ban was upheld in the state court of appeals, it was not tested in state or federal supreme courts. In 2009, the Ohio State Legislature enacted a law prohibiting the local ban.

Review of these cases did not identify differences in application based on whether landfills are owned and operated publicly or privately. If Grant County pursues such an approach, legal counsel may wish to include this issue in its formal legal review before the county takes any action to restrict waste based on jurisdiction of origin or the diversion actions of jurisdictions.

### *Typical Fee Structures*

Most landfill and transfer station fee structures are based on the volume of waste and the type of material disposed. Tip fees typically establish a minimum charge per load and a per-ton (weight) or per-cubic yard (volume) rate for larger loads. In addition to a standard rate for municipal solid waste, many disposal facilities also set alternative rates for particular materials. Materials separated for diversion, such as recyclables or yard waste, are frequently assessed at a lower rate. Key items, such as tires or electronics, may be assessed a specific fee. Some disposal facilities also have established surcharges for materials that they consider difficult to dispose, such as construction and demolition debris, agricultural plastics, or bulky items.

As an example, Tacoma, Washington, assesses a per-ton surcharge for asbestos and per-piece additional fees for appliances, tires, car seats, and furniture. The landfill also accepts separated recyclables and yard waste from residents for free. The Riverside County, California, established individual tip fees for different types of materials. “Routine refuse” is assessed at \$34 per ton, while disposed loads that contain more than 50 percent green waste are charged \$44 per ton. (The county sponsors an active backyard composting program, and more than a dozen privately operated sites are available for green waste drop-off.) Customers with loads containing “hard to handle” waste must pay \$45 per ton. Tires are assessed a per-unit surcharge for smaller quantities, and they are charged at \$97 per ton for larger amounts.

### **Technical Feasibility Findings**

Interviews with key informants revealed several technical barriers to establishing a tiered rate system based on the recycling participation of customers or jurisdictions. The three main barriers are as follows:

- The Ephrata Landfill’s current billing system is limited in its ability to manage different rates and account types.
- Differentiating waste by sector or jurisdiction is not possible on some hauler routes, and enforcement of tiered tip fees may be difficult.
- Tip fee changes may create rate-setting issues under state regulations and in city contracts.

### *Billing System Limitations*

Under the current billing system, Ephrata Landfill staff members apply a material category to a load, which is then assessed at the corresponding fee for that material. In the current system, staff members could create two material categories for the tiered rate system: one rate for loads associated with recycling participation and a separate rate for loads not associated with recycling participation. The current system, however, does not easily allow landfill staff to invoice customers that incur more than one charge per visit. For example, suppose a customer brings a material that incurs a separate surcharge or brings two types of materials (such as municipal solid waste and a set of tires). Currently, landfill staff members must calculate the two charges separately in the billing system then add them together by hand before they can inform the customer of the total charge for the visit.

### *Differentiation and Enforcement of Load- or Route-Specific Rates*

Route-specific tip fees would rely on accurate self-reporting by hauling companies and individual truck drivers. Many hauler routes do not contain “pure loads” of waste from one sector in one jurisdiction. Instead, one truck may contain waste from both residential and commercial customers in both a city with a contract and nearby unincorporated areas. If waste from residential city customers is eligible for a reduced tip fee, but waste from commercial or unincorporated customers is not, the gatehouse staff would have difficulty charging a fair tip fee on that load.

In addition, a significant portion of waste arrives at the Ephrata Landfill in transfer trailers from the CDSI Transfer Station in Moses Lake and the Delano Transfer Station near Grand Coulee City. Identifying the appropriate tip fee for these materials would rely on accurate reporting by the transfer stations.

Rates based on the material characteristics of each load, rather than origin, require inspectors to assess each load. The time and labor required for load inspecting depends on the type of load (such as heterogeneous bagged waste or relatively homogenous loose waste) and contamination threshold used.

### *Hauler Rate-Setting*

In interviews, key informants emphasized that haulers need reliable tip fees at the landfill to set rates for residential and commercial customers under Washington Utilities and Transportation Commission (WUTC) regulations as well as city contracts. The contact at WUTC particularly underscored the importance of consulting with haulers and WUTC before making major changes to either tip fees or minimum service requirements to avoid unintended and unanticipated consequences. Interviewees also cited fairness considerations in the rates charged to customers on a route who recycle compared to customers on that same route who do not recycle.

### *Other Technical Concerns*

Interviewees also cited the following additional concerns.

- Haulers and WUTC want to learn more about the cost impacts to customers of alternative rates.
- Pierce County cautioned against subsidizing diversion with garbage rates. As diversion increases and garbage decreases, garbage rates must continue to increase to cover the rising cost of the subsidy.
- WUTC recommended ensuring that adequate diversion facilities exist before changing rates to ensure that waste haulers and generators have a viable opportunity to earn the lower rate.
- The landfill does not currently have diversion facilities to collect and transfer compostable material, though it does have space to build additional infrastructure.

## **Summary of Legal and Technical Feasibility Review**

Prior to adopting a new rate structure, Grant County should consider the following actions.

- Consult with haulers, WUTC, and community before implementing a new structure.
- Request a formal legal review of any selected rate structure by the county’s legal advisors.
- Consider the risk of court challenges.
- Consider the cost to implement a new rate structure for the county, haulers, and customers.

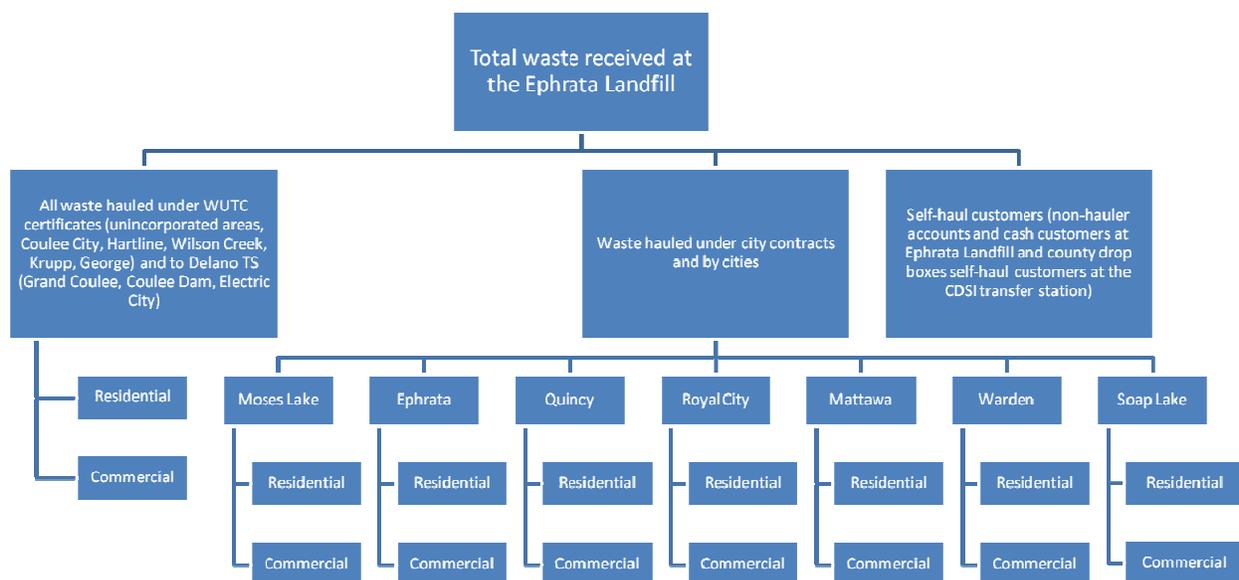
## II. Quantity of Recyclables and Compostables Disposed

Cascadia estimated the quantity of recyclable and compostable materials that are currently disposed in Grant County and, thus, are available for diversion. Quantities were estimated according to the geographic source or jurisdiction and waste stream sector. The jurisdictions included the 15 individual cities and towns served by municipal, contracted, or certificated (WUTC) haulers as well as the unincorporated areas of Grant County, served by certificated haulers. Waste stream sectors included residential waste collected by haulers, commercial waste collected by haulers, and self-hauled waste (from residential or commercial generators that is not collected by municipal, contracted, or certificated haulers).

### Methodology

To estimate disposed quantities of total waste by source jurisdiction and sector, Cascadia obtained information from Ephrata Landfill records, annual hauler reports to WUTC, and contacts at Consolidated Disposal Services, Inc. (CDSI), the Delano Transfer Station, Lakeside Disposal, and the City of Moses Lake. The following diagram, Figure 1, presents the breakdown of jurisdictions and waste sectors.

Figure 1. Sources of Waste Delivered to Ephrata Landfill



To estimate the disposed quantities of individual material types, Cascadia applied waste composition data that are specific to Grant County but were extracted from larger statewide studies that Cascadia conducted for the Washington State Department of Ecology. The composition of waste disposed by the residential and commercial sectors was based on sampling conducted in Grant and Okanogan counties in 2003 for the *Rural Waste Characterization Report*. Those compositions are based on 18 residential samples and 42 commercial samples. In the rural waste study, waste was categorized only by source generator, so self-haul waste was not analyzed separately. To estimate the composition of self-haul waste, Cascadia used data from 11 self-haul samples from a statewide study that is underway in 2009.

Data from the 2003 rural study were preferred for the residential and commercial sectors due to the study's larger sample size.

### Quantity Estimate Findings

The Ephrata Landfill received approximately 90,500 tons of municipal solid waste in 2008, as shown in Table 1. Grant County's three largest cities (Moses Lake, Ephrata, and Quincy) generated approximately 45 percent of that waste. Nearly a third of waste came from customers in unincorporated Grant County and cities served under WUTC certificates. Attachment B includes additional detail on overall quantities and composition for other contracted cities.

Waste can also be characterized by sector rather than by geography. Overall, the commercial sector generated approximately 42 percent of landfilled waste, while the residential sector generated 35 percent. Self-haul waste, which can come from both residential and commercial generators, accounted for about 23 percent of landfilled waste.

**Table 1. Estimated Annual Total Tonnage, by Jurisdiction**

	Residential	Commercial	Self-haul	Total
Moses Lake	7,600	10,700	n/a	<b>18,300</b>
Ephrata	2,700	3,100	n/a	<b>5,800</b>
Quincy	1,900	4,700	n/a	<b>6,600</b>
Other Contracted Cities	4,700	5,200	n/a	<b>9,900</b>
WUTC Areas	14,400	14,500	n/a	<b>28,900</b>
Self-haul	n/a	n/a	20,900	<b>20,900</b>
<b>Total</b>	<b>31,300</b>	<b>38,200</b>	<b>20,900</b>	<b>90,500</b>

*n/a = not available.*

*Quantities in this table and others are rounded, so numbers may not sum to totals.*

Based on waste composition data, Table 2 presents estimates of the percentage of waste from each sector composed of recyclables, yard waste, and food waste. Overall, 43 percent of waste disposed in the Ephrata Landfill is composed of recyclables, yard waste, and food waste. Recyclables included in this analysis are glass, aluminum cans and foil, tin and steel cans, PET and HDPE plastic containers, cardboard, newspaper, high-grade paper, and mixed and low-grade paper.

Recyclables and yard waste compose more than one quarter (28 percent) of residential waste. If food waste is included, more than half (54 percent) of residential waste potentially could be diverted with additional collection opportunities. Approximately 42 percent of commercial waste could be diverted, primarily to recycling and food waste composting. Only 27 percent of self-haul waste could be diverted; most of the divertible portion is yard waste (19 percent of the total).

**Table 2. Estimated Targeted Materials, by Sector (Percentage)**

	Residential	Commercial	Self-haul	Overall
<b>Recyclables</b>	18%	21%	5%	<b>16%</b>
<b>Yard Waste</b>	10%	4%	19%	<b>10%</b>
<b>Food Waste</b>	26%	18%	2%	<b>17%</b>
<b>Total</b>	<b>54%</b>	<b>42%</b>	<b>27%</b>	<b>43%</b>

The tons of each material category generated by each jurisdiction are calculated by applying the composition percentages to the tonnage estimates. Overall, the Ephrata Landfill received approximately 14,800 tons of recyclables; 8,600 tons of yard waste; and 15,300 tons of food waste, for a total of nearly 39,000 tons of divertible materials disposed in 2008. Table 3 presents a detailed breakdown of this disposed waste by jurisdiction, sector, and material category. Attachment B includes additional detail on overall quantities and composition for other contracted cities.

**Table 3. Estimated Targeted Materials by Jurisdiction (tons/year)**

	Recyclables	Yard Waste	Food Waste	Total
<b>Moses Lake</b>	<b>3,600</b>	<b>1,200</b>	<b>3,800</b>	<b>8,600</b>
Residential	1,400	800	2,000	4,100
Commercial	2,200	400	1,900	4,500
<b>Ephrata</b>	<b>1,100</b>	<b>400</b>	<b>1,200</b>	<b>2,800</b>
Residential	500	300	700	1,500
Commercial	600	100	600	1,300
<b>Quincy</b>	<b>1,300</b>	<b>400</b>	<b>1,300</b>	<b>3,000</b>
Residential	300	200	500	1,000
Commercial	1,000	200	800	2,000
<b>Other Contracted Cities</b>	<b>1,900</b>	<b>700</b>	<b>2,100</b>	<b>4,700</b>
Residential	900	500	1,200	2,600
Commercial	1,100	200	900	2,200
<b>WUTC Areas</b>	<b>5,700</b>	<b>2,000</b>	<b>6,300</b>	<b>13,900</b>
Residential	2,600	1,400	3,700	7,800
Commercial	3,000	600	2,600	6,200
<b>Self-haul</b>	<b>1,100</b>	<b>4,100</b>	<b>500</b>	<b>5,700</b>
<b>Total</b>	<b>14,800</b>	<b>8,600</b>	<b>15,300</b>	<b>38,800</b>

### III. Economic Analysis of Alternative Tip Fees

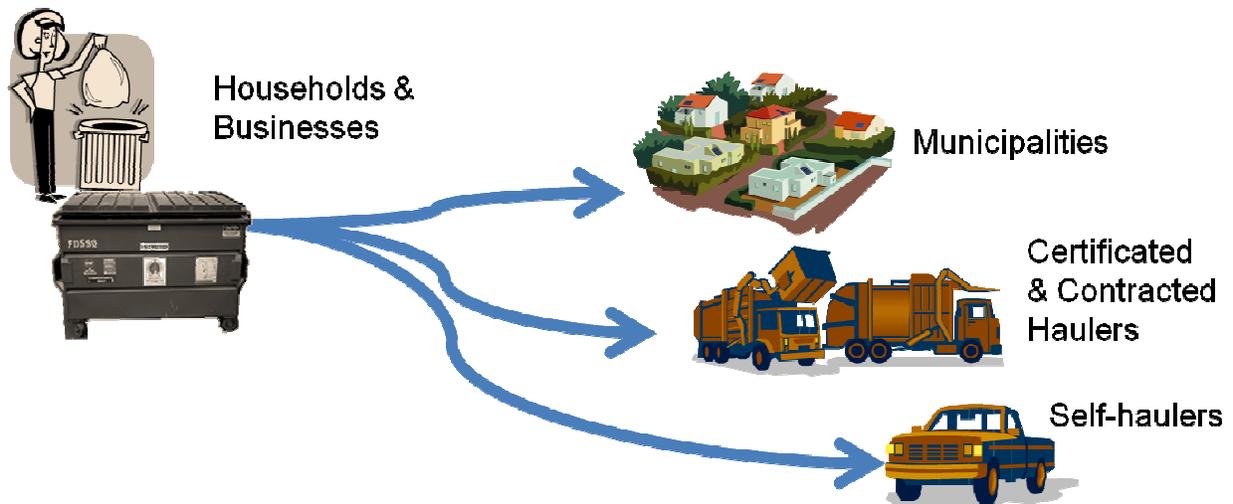
Using information on quantities, customers, and hauler rate schedules, the project team analyzed alternative tip fees required to provide an economic incentive to divert recyclables and compostables from each sector.

#### Methodology

##### Analytical Framework

The analysis began with examining customers, who respond to prices and services offered by municipalities and haulers, as illustrated in Figure 2. The project team assumed that municipalities are not likely—on their own—to require haulers to offer recycling or composting **unless customers can at least break even financially** by recycling or composting and downsizing their garbage containers.<sup>1</sup> Breaking even financially means that the extra cost of recycling or composting is offset by an equal reduction in garbage disposal costs—that is, customers are not paying more to add recycling services.

Figure 2. Waste Flows from Customers to Collectors



The analysis assumes that customers, for their part, will compare the cost of subscribing to new curbside recycling or composting services to their potential savings from reducing the size and cost of their garbage service. The break-even assumption states that customer savings on garbage must be equal to or greater than the additional cost of recycling or composting.

<sup>1</sup> Moses Lake will soon require its hauler to offer recycling service, but this analysis assumes that Grant County and its cities will make decisions for their citizens based on economics.

Accordingly, we assume that most customers will pay to subscribe to recycling only if they meet both of these conditions:

1. They can downsize their garbage service.
2. The cost of downsized garbage plus recycling or composting is no more than their current cost of the garbage service alone.

As an example, suppose a household in Ephrata that currently subscribes to garbage service with a 95-gallon container is considering whether it can subscribe to organics collection and reduce its trash service to a 65-gallon container. As shown in Table 4, at the current tip fee, the 95-gallon trash container alone (\$20.55) is less expensive than the 65-gallon trash container plus organics service (\$22.10).

If the tip fee at the landfill increases, the cost of garbage service increases based on the quantities in each container and the portion of the customer’s collection fee associated with disposal. For the customer to break even, the tip fee must increase enough to make the cost difference between the garbage service levels large enough to cover the additional cost of organics service. In this case, the tip fee must increase to \$72 per ton before the cost of the 95-gallon trash container alone (now \$25.45 after the garbage tip fee increase) equals the cost of the 65-gallon trash container plus organics service (also \$25.45).

**Table 4. Break-even Tip Fee Approach—Ephrata Organics Example**



Scenario	Tip fee	95-gallon trash		65-gallon trash + organics
<b>Current</b>	\$28 per ton	\$20.55	<	\$15.85 + \$6.25 = \$22.10
<b>Break-even</b>	\$72 per ton	\$25.45	=	\$19.20 + \$6.25 = \$25.45

Note that the break-even tip fee should be considered the absolute minimum; in fact, an additional incentive would likely be needed to encourage customers to make the change to sign up for recycling or composting.

### Cost and Quantity Assumptions

The project team gathered information on the quantities of waste disposed, the number of customers served by haulers in the three largest cities, the rates and fees assessed by haulers in the three largest cities and WUTC areas, and other information related to diversion costs, waste density, and price elasticity. The economic analysis relies on this information and assumptions around the costs to provide and subscribe to diversion services and the quantities of garbage, recyclables, and organics currently generated per household. Table 5 and Table 6 present these assumptions.

**Table 5. Cost Assumptions**

Service	Cost Estimate	Source
<b>Current tip fee (with tax)</b>	\$27.82 per ton	Grant County
<b>Drop-off yard waste</b>	\$68 per ton (County)	Grant County Solid Waste Management Plan (2008)
<b>Residential recycling (curbside in Moses Lake, Ephrata, and Quincy)</b>	\$165 per ton (hauler) \$6.25 per month (household)	WRAD <sup>2</sup> & Douglas County (Washington) recycling
<b>Residential recycling (curbside in other areas)</b>	\$230 per ton (hauler) \$7.00 per month (household)	WRAD & Douglas County recycling
<b>Residential compostables (curbside in Moses Lake, Ephrata, and Quincy)</b>	\$103 per ton (hauler) \$6.25 per month (household)	SWMP & Douglas County recycling
<b>Residential compostables (curbside in other areas)</b>	\$115 per ton (hauler) \$7.00 per month (household)	SWMP & Douglas County recycling
<b>Commercial paper and cardboard recycling</b>	\$100 per ton (hauler) Residential cost or 10% over hauler cost (business)	Sound Resource Management (Dr. Jeffrey Morris) & Douglas County recycling
<b>Commercial compostables</b>	\$95 per ton (hauler) Residential cost or 10% over hauler cost (business)	SWMP & Douglas County recycling

<sup>2</sup> Washington Recycling and Deposit research conducted by Cascadia Consulting Group for the Washington Beverage Association (2009).

**Table 6. Quantity Assumptions**

Factor	Assumption	Source
<b>Residential recyclables</b>	18% of current garbage quantity	Quantity analysis in this study
<b>Residential compostables</b>	36% of current garbage quantity	Quantity analysis in this study
<b>Self-haul yard waste</b>	19% of self-haul waste	Quantity analysis in this study
<b>Commercial paper recyclables</b>	16% of current garbage quantity	Quantity analysis in this study
<b>Commercial compostables</b>	22% of current garbage quantity	Quantity analysis in this study
<b>Commercial garbage density</b>	150 pounds per cubic yard	Sound Resource Management
<b>Household garbage density</b>	110 pounds per cubic yard	Sound Resource Management, calculated from Moses Lake data

**Customer Calculations**

This section presents the steps used to calculate the landfill tip fee that would increase monthly collection rates such that a customer would “break even” when subscribing to curbside recycling or organics service. As an example, figures are calculated for a household in Ephrata that currently subscribes to garbage service with a 95-gallon container and is considering whether it can subscribe to organics collection and downsize its trash service to a 65-gallon container. The calculation approach is the same for both residential and commercial customers in other jurisdictions.

**Step 1.** Estimate, by service level, the following quantities to determine whether the customer can reasonably downsize.

- Pounds disposed per month per household or business.
- Pounds that could be diverted.

Estimated average pounds disposed per household per month	
95 gallon cart	224 lbs
65 gallon cart	153 lbs.
Estimated difference	71 lbs.
Yard and food waste disposed monthly at 95 gallon cart level (36% of residential waste)	
	80 lbs.
Potential to downsize? <sup>3</sup>	
	Yes

<sup>3</sup> To simplify the calculations, we assumed that customers would downsize the total difference between average cart sizes if they could divert at least 75 percent of the cart size difference.

**Step 2.** Estimate the current cost incentives to downsize garbage and subscribe to diversion services by calculating the following figures.

- Current cost difference between service levels.
- Monthly cost of recycling or composting.

Current monthly cost of trash per household	
95 gallon cart	\$20.55
65 gallon cart	\$15.85
Cost savings from downsizing:	\$4.70
Estimated monthly cost of organics service per household	
	\$6.25
Net cost to customer of organics service per month	
	$\$6.25 - \$4.70 = \$1.55$

**Step 3.** Assuming the disposal portion of the monthly garbage rate will increase in direct relation to tip fee increases, calculate:

- Tip fee required to make the cost difference between service levels equal to the cost of recycling or composting.

Calculate break-even tip fee (per ton)	
Net customer cost (at current tip fee)	\$1.55
	÷
Waste diverted (in tons) <sup>4</sup>	0.0355 tons
	=
Break-even tip fee	
<b>\$28 + \$44 increase</b>	<b>= \$72 per ton</b>

<sup>4</sup> To simplify the calculations, we assumed that customers would downsize the total difference between average cart sizes if they could divert at least 75 percent of the cart size difference.

**Step 4.** To verify the break-even tip fee, calculate back to determine the new customer cost.

<b>Current Tip Fee = \$27.82/ton</b>	
<b>95-gallon cart without organics service</b>	
<b>Current monthly cost</b>	<b>\$20.55</b>
Disposal cost @ \$27.82/ton	\$3.12
Non-disposal cost*	\$17.43
No organics service	\$0.00
<b>65-gallon cart with organics service</b>	
<b>Current monthly cost</b>	<b>\$22.10</b>
Disposal cost @ \$27.82/ton	\$2.13
Non-disposal cost*	\$13.72
Organics service	\$6.25

<b>Break-even Tip Fee = \$71.61/ton</b>	
<b>95-gallon cart without organics service</b>	
<b>Increased monthly cost</b>	<b>\$25.45</b>
Disposal cost @ \$71.61/ton	\$8.02
Non-disposal cost*	\$17.43
No organics service	\$0.00
<b>65-gallon cart with organics service</b>	
<b>Increased monthly cost</b>	<b>\$25.45</b>
Disposal cost @ \$71.61/ton	\$5.48
Non-disposal cost*	\$13.72
Organics service	\$6.25

\* Imputed by subtracting estimated disposal cost from monthly fee; includes hauler costs of collection, transport, and overhead as well as hauler profit.

### Economic Analysis Findings

The tables below present the estimated break-even tip fees for both residential (Table 7) and commercial (Table 8) customers. In some cases, however, haulers may require additional tip fee increases to break even.

#### Curbside Residential Customers

To reach the break-even point for residential customers in the three largest cities, tip fees would need to increase by at least 40 percent and, more likely, by more than 150 percent. Tip fees in rural areas would need to increase by more than 200 percent. Break-even tip fees for customers in Moses Lake, Ephrata, and Quincy are lower than in other areas of the county primarily because of the assumption that the cost to subscribe to curbside diversion is less expensive in those three cities than in more rural areas where distances between residences are greater.

The break-even tip fees for residential organics service are lower than the break-even tip fees for residential recycling because residents are more likely to be able to downsize their garbage service after diverting organics waste. Yard waste and food waste are estimated to make up 36 percent of residential waste, while recyclables compose only 18 percent. A 65-gallon garbage cart is about one-third smaller than a 95-gallon cart, and a 35-gallon cart (the smallest possible) is just over half the size of a 65-gallon cart. Consequently, diverting recyclables alone will not remove enough garbage from the average household waste stream to permit downsizing its garbage cart size.

**Table 7. Break-even Tip Fees for Residential Curbside Collection**

Waste/Sector Category	Break-even customer tip fee (per ton)
<b>Residential customers in Moses Lake, Ephrata, and Quincy</b>	
Organics only	\$40 - \$75
Organics + Recycling	\$170 - \$250
Recycling only	>\$250
<b>Residential customers in unincorporated county and other cities (rural)</b>	
Organics only	\$90 - \$160
Organics + Recycling	\$325 - \$350
Recycling only	>\$350

**Curbside Commercial Customers**

In the commercial sector, the existing tip fee is at the break-even point for some customers because they currently could save money by diverting waste, if commercial paper recycling and composting services were available. Other customers, however, would need the tip fee to increase by 25 percent to 100 percent to break even.

Break-even tip fees for commercial customers are generally lower than for residential customers for two main reasons. First, we assumed that commercial customers would have more opportunities than residential customers to reduce garbage service levels—by changing both the size of their container and the frequency of pick-ups. For example, a business could reduce its service level by changing from a 4-yard container to a 3-yard container or by changing from twice-weekly to weekly collection.

Second, based on existing data, we assumed that commercial customers would pay a lower effective cost per ton for organics and paper recycling collection than residential customers. As with their garbage service, commercial customers typically are better able to “right-size” their service levels for recycling and organics collection, reducing unnecessary pick-up costs. Because businesses usually generate more materials than individual households, haulers can collect larger quantities at each stop. For example, a hauler can collect several 4-yard containers more quickly than servicing numerous households to reach the same total weight. This collection efficiency results in lower per-ton costs for commercial customers.

**Table 8. Break-even Tip Fees for Commercial Curbside Collection**

Waste/Sector Category	Break-even Customer Tip Fee (per ton)
Recycling (paper and cardboard only)	current tip fee to \$75
Organics	current tip fee to \$140

### Curbside Customers: Price Elasticity

Price elasticity is another way to assess the quantity impacts of a change in tip fee. Price elasticity estimates how changes in price affect demand. Two types of price elasticity are as follows:

- **Own-price elasticity** estimates how a percentage change in the price of one good or service (e.g., garbage service) affects the demand for that same good or service.
- **Cross-price elasticity** estimates how a percentage change in the price of one good or service (e.g., garbage service) affects the demand for another good or service (e.g., recycling service).

Table 9 presents price elasticity figures based on residential monthly solid waste data from Seattle, Washington, between 1979 and 2007, analyzed by Dr. Jeffrey Morris of Sound Resource Management. Note that the price elasticity is based on the price paid by curbside customers—not directly on the landfill tip fee. Data indicate that, holding all else equal (that is, not offering additional diversion), doubling garbage fees paid by customers could decrease garbage tonnage by 10 percent. For the cross-price elasticity, doubling garbage fees paid by customers could increase curbside recycling tonnage by 35 percent. The available data were not sufficient for Dr. Morris to determine a reliable cross-price elasticity figure for the price of garbage and the quantity of organics diversion.

Based on our analysis, tip fees are generally about one-third or less of the price paid by curbside customers, so doubling tip fees could decrease garbage by approximately 3 percent. Similarly, doubling tip fees (where curbside recycling is available) could increase recycling tons by about 12 percent. However, cross-price elasticity does not apply in areas that do not currently offer service for curbside collection of recyclables.

**Table 9. Price Elasticity for Garbage and Recycling**

Price Elasticity	Elasticity	Means if you...	Then...
<b>Own-price elasticity for garbage</b>	-10%	Double <b>garbage</b> fees (100% increase)	<b>Garbage</b> tons decrease by 10%
<b>Cross-price elasticity for garbage and recycling</b>	+35%	Double <b>garbage</b> fees (100% increase)	<b>Recycling</b> tons increase by 35%

The low own-price elasticity suggests that raising the tip fee alone will not reduce disposed quantities of garbage significantly. The moderate cross-price elasticity indicates that raising the tip fee in concert with the provision of curbside recycling could measurably increase diversion.

### Self-haul Customers

Waste from self-haul customers contains a low percentage of recyclable materials: only about 5 percent by weight. Yard waste, however, composes 19 percent of self-haul waste. While customers will break even if the tip fee for yard waste drop-off is the same as garbage disposal, more customers will participate if yard waste drop-off costs less. The landfill, however, also needs to break even to offer a yard waste diversion program, so the tip fee for garbage should increase to cover the costs of a yard waste drop-off program. The solid waste tip fee increase will depend on the amount (if any) charged for clean yard waste drop-off and the quantity of yard waste diverted.

The project team estimated the break-even tip fee required to cover the net program cost for four different scenarios: assuming the program would be free or would charge \$15 per ton of yard waste, and assuming the program would capture only the self-haul yard waste or would divert all yard waste. The net program cost was estimated by calculating the cost to divert yard waste, the cost savings from not disposing that material as garbage, and revenue (if any) from charging a fee to drop off yard waste. The net program cost was then divided by the remaining disposed tons (current garbage tons minus tons of yard waste diverted) to estimate the tip fee increase that would make the landfill break even. Cascadia used the following assumptions in these calculations.

- 90,500 tons of total materials are disposed.
- 4,100 tons of self-haul yard waste are disposed at County and CDSI facilities.
- 8,600 tons of total yard waste (including self-haul) are disposed.
- Grant County will incur a cost of \$68 per ton to divert drop-off yard waste (from its 2008 Solid Waste Management Plan).
- The current tip fee represents the cost to dispose drop-off waste.

As Table 10 shows, the tip fee would need to increase by approximately \$2.50 to \$3.25 for the county to break even if the drop-off program captures only yard waste disposed by current self-haul customers.

**Table 10. Drop-off Program Costs for Yard Waste Currently Self-hauled<sup>5</sup>**

Yard Waste Drop-off	Free drop-off	\$15 per ton of yard waste
<b>Cost to divert yard waste (\$68/ton)</b>	\$275,000	\$275,000
<b>Revenue from yard waste drop-off fee</b>	\$0	\$60,000
<b>Net program cost</b>	\$275,000	\$215,000
<b>Tip fee increase to cover program cost</b>	<b>\$3.25 per ton</b>	<b>\$2.50 per ton</b>

<sup>5</sup> Figures in table are rounded.

If the program captured all the yard waste disposed by residential, commercial, and self-haul customers, the tip fee would need to increase by an estimated \$5.50 to \$7.25 per ton for the landfill to break even.

**Table 11. Drop-off Program Costs for All Yard Waste<sup>6</sup>**

Yard Waste Drop-off	Free	\$15 per ton of yard waste
<b>Cost to divert yard waste (\$68/ton)</b>	\$590,000	\$590,000
<b>Revenue from yard waste drop-off fee</b>	\$0	\$130,000
<b>Net program cost</b>	\$590,000	\$460,000
<b>Tip fee increase to cover program cost</b>	<b>\$7.25 per ton</b>	<b>\$5.50 per ton</b>

### Summary of Economic Analysis of Tip Fees

Given the current tip fees of about \$28 per ton, Grant County could not offer sufficient “credits” to provide the economic incentives required to implement new recycling and composting collection programs. That is, the credits could not be made high enough to offset the costs of recycling or composting to enable customers to “break even” financially. For residential and commercial customers to break even, making recycling or composting a cost-effective alternative, the tip fees would need to increase dramatically:

- **City residential**—at least a 40 percent increase, and more likely greater than 150 percent.
- **Rural residential**—more than a 200 percent increase.
- **Commercial**—no increase is needed for some customers; a 25 percent increase would be needed for some; and others would require more than 100 percent increase.

It is important to note that the tip fees necessary to make haulers break even vary, but many are as high as or higher than the customer break-even tip fees.

Grant County could pay for free or reduced-fee yard waste drop-off with a relatively small increase in garbage tip fee, depending on the quantity of material captured. The increase is estimated at \$2 to \$3 per ton for yard waste currently disposed by self-haul customers and \$5 to \$8 per ton if all the yard waste currently disposed were diverted.

<sup>6</sup> Figures in table are rounded.

## Summary and Next Steps

The legal feasibility review found neither clear limitations nor clear authorization to set tip fees based on recycling and composting participation by customers or jurisdictions. The current billing system and hauler routes pose technical difficulties to such an approach, however. Approximately 43 percent of waste disposed in the Ephrata Landfill consists of recyclable (15,000 tons) and compostable materials (24,000 tons)—much of which could be diverted if programs were available and financial incentives encouraged participation.

The economic analysis indicates that, for many curbside customers, the tip fee would need to increase significantly (from 40 percent to more than 200 percent) for them to at least break even if they had to pay to subscribe to curbside recycling or composting. The tip fee required for residential customers to break even on recycling is much higher than the increase for composting because customers dispose of a much larger quantity of yard and food waste, and thus could more easily reduce the size of their garbage service through composting.

While some commercial customers would already break even or save money by signing up for paper recycling or composting (if those services were available), others would need to see a tip fee increase of 25 percent to 100 percent before they would break even.

To achieve its diversion objectives, Grant County may want to consider additional options, in place of or to supplement a rate structure based on recycling and composting participation. Some options are as follows:

1. Offer free drop-off for clean green yard trimmings at Ephrata Landfill.
2. Encourage diversion through surcharges on loads with significant portions (e.g., more than 50 percent) of recyclable paper or organics.
3. Initiate a series of tip fee increases over time to help pay for enhanced recycling and composting services and to provide incentives to reduce waste.
4. Require haulers to offer “safety net” paper recycling for commercial customers.
5. Require cities to provide organics collection to residential customers and embed the cost of this service in the garbage rates.
6. Establish minimum service levels in unincorporated areas to include organics collection for residential customers.

These options would require additional study but could help Grant County divert waste, reduce greenhouse gas emissions, and extend the life of the Ephrata Landfill.

After reviewing the findings documented in the preceding chapters of this report, Grant County requested additional information on three of these options: Option #1, free drop-off for clean green yard trimmings; Option #2, surcharges on disposed loads with high recyclable content; and Option #5, residential organics collection with embedded rates. Attachment A provides an overview of these three additional options to increasing diversion of recyclables and organics and to extending landfill life in Grant County.

## Attachment A. Additional Options

Grant County requested additional information on the following three options that could increase recycling, composting, and diversion from the Ephrata Landfill:

1. **Offer free drop-off for clean green yard trimmings** at the Ephrata Landfill.
2. **Encourage diversion through surcharges on loads** with significant portions (e.g., more than 50 percent) of recyclable paper and organics.
3. **Require cities to provide organics collection** to residential customers and embed the cost of this service in the garbage rates.

This section provides additional information on these options. Note that Grant County should conduct a formal legal review and more detailed cost analysis before taking action to implement them.

### 1. Free Drop-off for Clean Green Yard Trimmings

In this option, Grant County would accept yard trimmings for free at the Ephrata Landfill. The county would then transfer the material to an existing compost facility for composting.

#### *Implementation Strategy*

Initially, the county should accept only yard trimmings, though additional organic materials could be included in the future. The county would need to arrange for customer drop-off of materials, appropriate storage on site (if necessary), and transport to a permitted compost facility. Even when the yard waste is separated and intended for composting, it is considered solid waste until the composting process has finished. Consequently, the county must follow solid waste regulations, such as those regarding vector control and leachate management. The yard waste material should be in a container, on a concrete pad, or on another solid surface at all times. For material stored on site, the county will need to provide an enclosed storage container, such as a drop box with a lid that is closed every night. In general, the county should not store yard waste longer than a week.

At the Ephrata Landfill, the county has two main options for handling yard trimmings. In both options, the county would need at minimum a concrete pad for the collection area and containers for the yard waste. The county may also need to control, collect, and treat runoff water from the concrete pad.

- The county could have customers deposit yard waste directly onto a ground-level concrete pad; then, staff would use a front-loader to assemble the material and lift it into a drop box.
- The county could construct additional infrastructure with a ramp to a tipping floor raised above a drop box. In this arrangement, customers could either deposit the yard waste directly into the drop box or onto the tipping floor, with a front-loader pushing the material into the drop box.

When selecting the yard waste drop-off location at the Ephrata Landfill, the county should consider an appropriate traffic pattern to accommodate customers with both separated yard waste and garbage to dispose. The yard waste collection site should be staffed or otherwise observed to reduce contamination with non-compostable materials.

The Ephrata Landfill may need several drop box containers available to contain and transport yard waste during the peak period from March 1 to October 31. Cascadia estimates that self-haul customers currently deliver directly to the Ephrata Landfill approximately 80 cubic yards of yard waste per day during these months. This figure was estimated using the four following steps:

- Step 1. Estimate total annual quantity generated.** Cascadia assumes that the yard waste diversion program will initially capture only the yard waste currently self-hauled directly to the Ephrata Landfill, which is approximately 2,300 tons per year. The remainder of self-hauled yard waste in the county currently arrives at the landfill in transfer trailers and drop boxes from the CDSI transfer station and county drop-off sites.
- Step 2. Estimate total quantity generated during peak period.** Cascadia assumes that approximately 80 percent of yard waste is generated during the peak period from March 1 through October 31. This portion translates to approximately 1,850 tons currently delivered directly to the Ephrata Landfill.
- Step 3. Estimate quantity generated per operating day during peak period.** The Ephrata Landfill operates approximately 210 days during the peak period, so the average daily quantity is estimated at approximately 9 tons.
- Step 4. Estimate average daily volume in cubic yards.** The average density of yard waste is estimated at 220 pounds per cubic yard, which results in an average daily volume of approximately 80 cubic yards.<sup>7</sup>

Diversion programs typically begin slowly, so a more likely scenario is that only a portion of the total yard waste currently delivered directly to the landfill will be separated for composting when the program begins. Over time, participation among landfill self-haul customers will increase, and self-haulers who currently deliver yard waste elsewhere may begin to deliver separated yard waste to the Ephrata Landfill for free drop-off.

The county will need to arrange to transport the material to a permitted compost facility, such as Royal Organic Products or Quincy Compost Facility. Both facilities accept yard waste; Royal Organic Products also accepts food waste if mixed with yard waste. The county could use the same transport method it uses to transport garbage from county drop boxes to the Ephrata Landfill.

Grant County would also need to conduct public education and outreach to promote this program and provide new signage at the landfill.

### *Estimated Cost*

Grant County's 2008 *Solid Waste Management Plan Update* (SWMP) estimates that a yard waste drop-off program would cost the county \$68 per ton, including drop boxes, hauling, and disposal costs. Since the SWMP was written, however, costs have increased. For example, the tip fee at Royal Organic

---

<sup>7</sup> This figure is an average of the densities for different yard waste materials. The density of leaves and grass is estimated at 312.5 pounds per cubic yard (based on USEPA information), and the density of prunings, trimmings, branches, and stumps is estimated at 127 pounds per cubic yard (based on California data). USEPA Municipal and Industrial Solid Waste and University of California at Los Angeles Extension, Recycling and Municipal Solid Waste Management Program, Business Waste Prevention Quantification Methodologies—Business Users Guide, Grant Number CX 824548-01-0 (Washington, D.C., 1996). California Integrated Waste Management Board, California Targeted Statewide Waste Characterization Study: Detailed Characterization of Construction and Demolition Waste, 2004. <http://www.ciwmb.ca.gov/publications/default.asp?pubid=1185>

Products has increased by 11 percent from \$13.50 to \$15.00 per ton. Assuming that drop box and hauling costs increased similarly, an updated cost per ton for a yard waste drop-off program is estimated at approximately \$75 per ton. The cost estimate in the SWMP did not include constructing a concrete pad or ramp or purchasing a front-loader, which would be needed unless existing equipment can be redeployed. A more detailed site analysis would be needed to estimate the capital costs for a concrete pad or ramp.

At the rate of \$75 per ton, operating such a program is estimated to cost approximately \$170,000 per year if it captures all of the yard waste currently delivered by self-haul customers directly to the Ephrata Landfill (2,300 tons). If the program also captures yard waste currently disposed by self-haul customers at the CDSI transfer station and county drop-boxes (for a total of 4,100 tons), the program is estimated to cost approximately \$305,000 per year.

The Quincy Compost Facility does not currently charge a tip fee but may implement one if the county begins a diversion program that delivers large quantities of materials to this facility. Royal Organic Products currently accepts yard waste and food waste if mixed with yard waste for \$15 per ton.

## **2. Surcharge on Loads with High Recyclable Paper or Organics Content**

To encourage customers that generate large quantities of recyclable paper or organics to separate these materials for recycling, Grant County could establish a surcharge for loads that contain a high percentage of these materials. By developing a system to identify these loads and informing customers that these materials do not belong in the landfill, Grant County can set the stage for future exclusion of these materials from its disposed waste stream.

Cascadia examined two jurisdictions—Riverside County and the City of Berkeley, both in California—that have established such a surcharge. Riverside County charges an additional \$10 per ton or \$3 per load (if 800 pounds or less) for loads that contain more than 50 percent green waste. In 2010, the City of Berkeley will begin assessing a 50 percent surcharge on loads that contain more than 10 percent plant debris to help enforce a county-wide disposal ban.

When considering this option, it is important to note that a surcharge will not divert materials unless other disposal options are available. Currently, two compost facilities operate in Grant County, neither of which accepts deliveries of commercial food waste. The county's drop-off recycling locations currently accept cardboard and newspaper but not other paper. Haulers in the county offer commercial cardboard collection, but they do not yet offer commercial composting or paper recycling.

### ***Implementation Strategy***

Grant County would need to establish the threshold that triggers the surcharge. In Riverside County, loads that contain more than 50 percent green waste are charged the higher fee. In Berkeley, loads that contain more than 10 percent plant debris are charged the higher fee. Grant County would also need to determine the surcharge amount for affected loads. The county could charge either a flat fee per load or a higher tip fee assessed per ton. The fee should be high enough to create a sufficient incentive for many customers to separate their compostable and recyclable materials from their waste.

Staff at the Ephrata Landfill and county drop boxes will need a method to identify loads that should be assessed the surcharge. At Riverside County landfills, gatehouse staff members rely on customers to self-report the materials being disposed. Gatehouse staff ask customers what they are hauling; if the

customer reports a mix of green waste and “regular refuse,” gatehouse staff ask which material is more prevalent. Customers that report disposing green waste are charged the surcharge. At the Berkeley transfer station, customers who self-report that their loads contain more than 10 percent plant debris pay the surcharge and are given a special colored placard that alerts staff at the tipping floor that they are allowed to dispose plant debris. Plant debris is on the list of prohibited materials that tipping floor staff at the Berkeley transfer station identify through an existing process of random load inspections. At the Berkeley transfer station, when customers disposing of covered materials are discovered not to have self-reported, inspectors record information about the vehicle and send the customer back to the gatehouse to be charged the correct fee.

A contact at Riverside County stated that the self-reporting system works well for two reasons. First, according to the interviewee, gatehouse staffers are familiar with haulers that regularly dispose green waste. Second, the county has a hazardous waste load check program whose inspectors will report haulers that they inspect and find to have mischaracterized the load (as indicated on their gatehouse ticket). Although green waste is not the focus of the load inspections, the hazardous waste load check program provides an effective enforcement mechanism because haulers know that their loads may be inspected. Information on hazardous waste inspections provides insight into the time required to inspect loads in general. According to a contact at Riverside County, hazardous waste inspections take approximately five minutes to identify the presence of hazardous waste in selected loads.

In Grant County, staff at drop boxes would likely be able to visually inspect all loads as they are dumped. The Ephrata Landfill could use a hybrid system in which customers self-report their load contents at the gatehouse, and staff members who are regularly stationed at the landfill face also identify loads with large quantities of recyclable paper or organic materials. Gatehouse staff could give customers a colored placard that identifies whether the customer reported disposing significant quantities of recyclable paper or organic materials. Staff at the landfill face would identify from a distance loads that appear to contain large quantities of recyclable paper or organics but whose vehicles do not have a colored placard that indicates the customer reported disposing these materials. Staff would then inspect these loads up close to confirm the percentage of these materials. When staff identify customers disposing significant quantities of recyclable paper or organic materials without the proper placard, they would record information about the driver and vehicle; then, the inspector would send the customer back to the gatehouse to be assessed the surcharge.

The county may also need an appeals process for haulers to contest the load inspector’s designation. One option is to spread out the load at the tipping site for a more detailed visual analysis and take a photograph as a record. Cascadia can provide further information on visually characterizing loads and converting volumes to weight quantities, if desired.

For an effective program, the county should create an outreach program to educate the public about both the surcharge and the options for composting organics and recycling.

### *Estimated Cost*

Cascadia estimates that developing a surcharge program, including threshold and surcharge amounts, load identification methods, training materials (if needed), and an appeals process, could require 80 to 150 hours of staff or consultant time, depending on the extent of staff participation and training needs.

The county may also incur additional costs in staff time for training and implementing the inspection process. The implementation cost will depend on the load identification method chosen. A program that

relies entirely on self-reporting by haulers would not require significant time for training or implementation. A program that includes some visual inspection may require additional staff time for training and implementation. Based on Cascadia's experience, loads with significant quantities of organics and recyclable paper are easy to identify from a distance, so staff at the landfill face would need to inspect only a small number of loads up close. Cascadia expects that the current staff at county drop boxes and the Ephrata Landfill face could identify loads from a distance and visually inspect most suspect loads up close without significantly increasing their workload, assuming that most close-up inspections would take less than five minutes and only a fraction of all loads would be inspected. If the county chooses to conduct close-up inspections of all loads without placards indicating recyclable paper and organic materials, the county may need to hire a dedicated load inspector, who would likely receive a similar salary to other employees working at the landfill face.

The cost of a public education program depends on the type and extent of outreach conducted, such as signage at the landfill, informational mailers, or a media campaign.

The surcharge would generate some revenue to offset the cost of a load inspection program, but the number of loads that would incur the surcharge and the potential revenue from the surcharge cannot be estimated based on currently available data. The focus of such a program should be on diverting materials to composting and recycling, rather than generating revenue.

### **3. Require Cities to Provide Embedded Organics Collection for Residents**

By updating or amending its Solid Waste Management Plan (SWMP) and working with the affected cities, Grant County could require cities with a population of 5,000 or greater to provide organics collection for residents and embed its cost in solid waste collection charges. Such a provision would currently affect the cities of Moses Lake, Ephrata, and Quincy. Embedding organics collection into garbage rates can increase diversion quantities because households that choose to compost do not have to pay extra compared to households that do not compost. Instead, residents subscribe to solid waste service that includes the garbage container size of their choice plus an organics container; the bill lists only one total cost for the service, with the organics container included automatically. Such a rate structure creates an incentive to divert organics, as customers may be able to save money by decreasing the size of their garbage service.

#### ***Implementation Strategy***

To require cities to provide residential organics collection with embedded rates, Grant County would need to either update or amend its SWMP. Both options require the approval of the three affected cities. It is unclear at this point which process would be necessary. The current SWMP discusses the option of curbside organics collection in the three cities, but it did not include the option among its recommendations.

A plan update requires formal review by the Solid Waste Advisory Committee (SWAC), participating local jurisdictions, the Department of Ecology (Ecology), the Washington Utilities and Transportation Commission (WUTC), and the public, as detailed in Section 1.9.3 of the SWMP. The update requires the SWAC and participating local governments to approve a revised preliminary draft plan to send to Ecology and WUTC for a 120-day review period. After making revisions based on comments received, the plan must be resubmitted to Ecology for a second review. Each participating local jurisdiction must

then adopt the plan, which would be sent to Ecology for final approval. According to the current SWMP, an update is required for changes to:

- Goals or policies.
- Final disposal option (unless accounted for in the existing plan).
- Financing methods and funding levels.
- Recycling program implementation.

Less extensive changes—such as additions to an existing program or changes that implement a program, rather than define the planning vision—can be made through an amendment with a simpler review and approval process. According to the current SWMP, an amendment would require sending a requested plan amendment to the Grant County Public Works Department, which would forward the request to the county’s SWAC and to affected jurisdictions for review. If the SWAC recommends approval, the plan amendment would then need approval from the affected jurisdictions and the Grant County Board of Commissioners. Once the affected jurisdictions adopt the plan amendment, it would be submitted to the Department of Ecology for approval. After approval is received from Ecology, the amendment would be incorporated into the SWMP.

In addition to approving an update or amendment to the SWMP, cities would need to change their contracts with haulers, which may require waiting until the current contracts expire. Haulers would need to recalculate their rate schedules, purchase and deliver residential organics containers, and potentially add trucks and reassign truck routes. Haulers would also need to negotiate with a composting facility to accept the material. Cities—on their own, through hauler contracts, or via a third party—would need to promote the program and explain it to residents.

### *Estimated Cost*

The cost to amend or update the county SWMP will vary based on stakeholder involvement, support, and opposition. Amending the county SWMP is estimated to cost approximately \$40,000 to \$60,000 in county staff time and consultant costs. Updating the SWMP, which involves a more extensive review and approval process, is estimated to cost approximately \$80,000 to \$125,000. These figures are provided only as context; the actual cost to amend or update the plan may be higher or lower.

Based on information from Mark Wash at CDSI, Cascadia estimates that curbside residential organics collection could cost the average customer an additional \$5-\$7 per month, before including any savings from downsizing of garbage service. He suggested that the cost per household would likely be lower if organics collection were embedded because total program costs would be spread over more customers. This estimate does not include the costs to promote the new program or explain it to customers.

Currently, Quincy residents have the option to subscribe to a 95-gallon yard waste container for \$14.09 per month. Of this fee, CDSI receives approximately \$4 to provide curbside containers and to collect and transport yard debris to the Quincy Compost Facility. The City of Quincy receives the remainder of the fee. According to Wash, the hauler served approximately 660 yard waste carts in Quincy in October 2009, compared to approximately 1,600 garbage accounts. This equates to a 42 percent participation rate, assuming that each participating household has only one yard waste bin.

Wash estimated that CDSI could provide residential yard waste collection in the City of Ephrata for approximately \$4.75 per household per month if materials were delivered to the Quincy Compost Facility or for approximately \$6 if delivered to Royal Organic Products, excluding tip fees. These figures assume that the program is voluntary, has a participation rate equal to Quincy's current rate, and that CDSI does not provide education or promotion regarding the program. For comparison, Wash reported that CDSI currently charges residential customers in Ephrata approximately \$3.10 to provide curbside containers and to collect and transport garbage to the Ephrata Landfill, excluding the tip fee. Cascadia assumes that collection and transport costs in Moses Lake would be similar.

Although the Quincy Compost Facility does not currently charge a tip fee, it is likely to establish a fee before accepting waste from outside the city. Royal Organic Products currently charges \$15 per ton for yard waste and for food waste mixed with yard waste. At this price, and assuming that a household would generate up to 80 pounds of organics per month, the tip fee could add approximately \$0.60 to the monthly cost.<sup>8</sup> When combined with the estimates for collection and transport from CDSI (ranging from \$4.75 to \$6.00, depending on the processing facility) the total fee is estimated to be approximately \$5.35 to \$6.60 per household per month.

## Summary of Options

This section described the basic steps and, where possible, the estimated costs to develop and implement three options to divert waste from the Ephrata Landfill:

- 1. Offer free drop-off for clean green yard trimmings** at the Ephrata Landfill.
- 2. Encourage diversion through surcharges on loads** with significant portions (e.g., more than 50 percent) of recyclable paper and organics.
- 3. Require cities to provide organics collection** to residential customers and embed the cost of this service in the garbage rates.

Of the three options, offering free drop-off for clean green waste appears to require the most effort by Grant County in program development and ongoing operations. The county would need to build a drop-off site at the landfill, invest in collection containers, transport materials to a compost facility, and pay tip fees for composting. This option could divert up to 2,300 tons per year (based on the total quantity of yard waste currently self-hauled to the Ephrata Landfill), but the initial quantity diverted would likely be much smaller. In the future, self-haul customers that currently use drop-box locations and the CDSI transfer station may instead deliver source-separated yard waste to the Ephrata Landfill for free drop-off, increasing the quantities diverted over time.

In contrast, encouraging diversion through surcharges on loads requires fewer resources and may be revenue-neutral or even revenue-generating, depending on the amount of funds collected through the surcharge. The effectiveness of the surcharge relies on having alternatives available for composting organics and recycling paper, especially through commercial haulers.

---

<sup>8</sup> Cascadia estimated that a household with the largest size garbage container (95 gallons) would generate approximately 80 pounds of organics per month. See *Customer Calculations* on page 14 for more details.



Requiring cities to provide embedded organics collection would require an initial outlay of funding and political capital by the county to amend or update its Solid Waste Management Plan, after which customers are estimated to pay an additional \$5 to \$7 per month. Embedded organics collection is generally considered an effective diversion method because customers can save money by reducing their garbage bill if they use the organics container. In Quincy, approximately 42% of customers already pay \$14 per month to subscribe to yard waste service.

## Attachment B. Detailed Quantity Findings

Detailed findings on the quantities of recyclable and compostable materials disposed by each jurisdiction are presented in an attached spreadsheet. The spreadsheet includes the following tables:

- Tables B-1 and B-2. **Total waste delivered to Ephrata Landfill**—total waste quantities, quantities of recyclables and organics, and composition percentages by sector.
- Table B-3. **City of Ephrata**—quantities of total waste, recyclables, and organics by sector.
- Table B-4. **City of George**—quantities of total waste, recyclables, and organics by sector.
- Table B-5. **City of Mattawa**—quantities of total waste, recyclables, and organics by sector.
- Table B-6. **City of Moses Lake**—quantities of total waste, recyclables, and organics by sector.
- Table B-7. **City of Quincy**—quantities of total waste, recyclables, and organics by sector.
- Table B-8. **Royal City**—quantities of total waste, recyclables, and organics by sector.
- Table B-9. **City of Soap Lake**—quantities of total waste, recyclables, and organics by sector.
- Table B-10. **City of Warden**—quantities of total waste, recyclables, and organics by sector.
- Tables B-11 through B-14. **Areas served by certificated haulers**—quantities of total waste, recyclables, and organics by sector.
- Table B-15. **Self-haul customers**—quantities of total waste, recyclables, and organics by sector.
- Table B-16. **Estimated percentage composition for key recyclable and compostable materials** by sector.

**Table B-1. Total Waste Delivered to Ephrata Landfill**

	Residential	Commercial	Self-haul	Total
<b>TOTAL WASTE (tons)</b>	<b>31,349</b>	<b>38,213</b>	<b>20,896</b>	<b>90,458</b>
<b>Recyclables</b>	<b>5,745</b>	<b>7,973</b>	<b>1,101</b>	<b>14,819</b>
Glass (clear)	277	575	235	1,087
Glass (green)	49	14	8	71
Glass (brown and other colors)	287	539	161	988
Aluminum Cans & Foil	277	232	74	583
Tin Cans	385	218	6	609
PET Bottles & Containers	322	239	57	618
HDPE Bottles & Containers	360	195	22	577
Cardboard	866	2,076	446	3,388
Newspaper	555	795	13	1,363
High-grade paper	269	902	0	1,172
Mixed & low-grade paper	2,099	2,185	78	4,362
<b>Organics</b>	<b>11,192</b>	<b>8,220</b>	<b>4,579</b>	<b>23,991</b>
Yard Waste	3,130	1,457	4,057	8,644
Food Waste	8,063	6,764	522	15,348
<b>Other Waste</b>	<b>14,411</b>	<b>22,020</b>	<b>15,216</b>	<b>51,648</b>

**Table B-2. Total Waste Delivered to Ephrata Landfill**

	Residential	Commercial	Self-haul	Total
<b>TOTAL WASTE (Percentages)</b>	<b>35%</b>	<b>42%</b>	<b>23%</b>	<b>100%</b>
<b>Recyclables</b>	<b>18%</b>	<b>21%</b>	<b>5%</b>	<b>16%</b>
Glass (clear)	1%	2%	1%	1%
Glass (green)	0%	0%	0%	0%
Glass (brown and other colors)	1%	1%	1%	1%
Aluminum Cans & Foil	1%	1%	0%	1%
Tin Cans	1%	1%	0%	1%
PET Bottles & Containers	1%	1%	0%	1%
HDPE Bottles & Containers	1%	1%	0%	1%
Cardboard	3%	5%	2%	4%
Newspaper	2%	2%	0%	2%
High-grade paper	1%	2%	0%	1%
Mixed & low-grade paper	7%	6%	0%	5%
<b>Organics</b>	<b>36%</b>	<b>22%</b>	<b>22%</b>	<b>27%</b>
Yard Waste	10%	4%	19%	10%
Food Waste	26%	18%	2%	17%
<b>Other Waste</b>	<b>46%</b>	<b>58%</b>	<b>73%</b>	<b>57%</b>

**Table B-3. City of Ephrata**

Served by CDSI

	Residential	Commercial
<b>TOTAL WASTE (tons)</b>	<b>2,712</b>	<b>3,114</b>
<b>Recyclables</b>	<b>497</b>	<b>650</b>
Glass (clear)	24	47
Glass (green)	4	1
Glass (brown and other colors)	25	44
Aluminum Cans & Foil	24	19
Tin Cans	33	18
PET Bottles & Containers	28	19
HDPE Bottles & Containers	31	16
Cardboard	75	169
Newspaper	48	65
High-grade paper	23	74
Mixed & low-grade paper	182	178
<b>Organics</b>	<b>968</b>	<b>670</b>
Yard Waste	271	119
Food Waste	698	551
<b>Other Waste</b>	<b>1,247</b>	<b>1,794</b>

**Table B-4. City of George**

Served by CDSI

	Residential	Commercial
<b>TOTAL WASTE (tons)</b>	<b>567</b>	<b>567</b>
<b>Recyclables</b>	<b>104</b>	<b>118</b>
Glass (clear)	5	9
Glass (green)	1	0
Glass (brown and other colors)	5	8
Aluminum Cans & Foil	5	3
Tin Cans	7	3
PET Bottles & Containers	6	4
HDPE Bottles & Containers	7	3
Cardboard	16	31
Newspaper	10	12
High-grade paper	5	13
Mixed & low-grade paper	38	32
<b>Organics</b>	<b>202</b>	<b>122</b>
Yard Waste	57	22
Food Waste	146	100
<b>Other Waste</b>	<b>261</b>	<b>327</b>

**Table B-5. City of Mattawa**

Served by CDSI

	Residential	Commercial
<b>TOTAL WASTE (tons)</b>	<b>1,512</b>	<b>756</b>
<b>Recyclables</b>	<b>277</b>	<b>158</b>
Glass (clear)	13	11
Glass (green)	2	0
Glass (brown and other colors)	14	11
Aluminum Cans & Foil	13	5
Tin Cans	19	4
PET Bottles & Containers	16	5
HDPE Bottles & Containers	17	4
Cardboard	42	41
Newspaper	27	16
High-grade paper	13	18
Mixed & low-grade paper	101	43
<b>Organics</b>	<b>540</b>	<b>163</b>
Yard Waste	151	29
Food Waste	389	134
<b>Other Waste</b>	<b>695</b>	<b>436</b>

**Table B-6. City of Moses Lake**

Served by Lakeside Disposal

	Residential	Commercial
<b>TOTAL WASTE (tons)</b>	<b>7,612</b>	<b>10,662</b>
<b>Recyclables</b>	<b>1,395</b>	<b>2,224</b>
Glass (clear)	67	161
Glass (green)	12	4
Glass (brown and other colors)	70	150
Aluminum Cans & Foil	67	65
Tin Cans	93	61
PET Bottles & Containers	78	67
HDPE Bottles & Containers	87	55
Cardboard	210	579
Newspaper	135	222
High-grade paper	65	252
Mixed & low-grade paper	510	610
<b>Organics</b>	<b>2,718</b>	<b>2,294</b>
Yard Waste	760	406
Food Waste	1,958	1,887
<b>Other Waste</b>	<b>3,499</b>	<b>6,144</b>

**Table B-7. City of Quincy**

Served by CDSI

	Residential	Commercial
<b>TOTAL WASTE (tons)</b>	<b>1,890</b>	<b>4,724</b>
<b>Recyclables</b>	<b>346</b>	<b>986</b>
Glass (clear)	17	71
Glass (green)	3	2
Glass (brown and other colors)	17	67
Aluminum Cans & Foil	17	29
Tin Cans	23	27
PET Bottles & Containers	19	30
HDPE Bottles & Containers	22	24
Cardboard	52	257
Newspaper	33	98
High-grade paper	16	112
Mixed & low-grade paper	127	270
<b>Organics</b>	<b>675</b>	<b>1,016</b>
Yard Waste	189	180
Food Waste	486	836
<b>Other Waste</b>	<b>869</b>	<b>2,722</b>

**Table B-8. Royal City**

Served by CDSI

	Residential	Commercial
<b>TOTAL WASTE (tons)</b>	<b>945</b>	<b>756</b>
<b>Recyclables</b>	<b>173</b>	<b>158</b>
Glass (clear)	8	11
Glass (green)	1	0
Glass (brown and other colors)	9	11
Aluminum Cans & Foil	8	5
Tin Cans	12	4
PET Bottles & Containers	10	5
HDPE Bottles & Containers	11	4
Cardboard	26	41
Newspaper	17	16
High-grade paper	8	18
Mixed & low-grade paper	63	43
<b>Organics</b>	<b>337</b>	<b>163</b>
Yard Waste	94	29
Food Waste	243	134
<b>Other Waste</b>	<b>434</b>	<b>436</b>

**Table B-9. City of Soap Lake**

Served by municipal hauler

	Residential	Commercial
<b>TOTAL WASTE (tons)</b>	<b>386</b>	<b>539</b>
<b>Recyclables</b>	<b>71</b>	<b>112</b>
Glass (clear)	3	8
Glass (green)	1	0
Glass (brown and other colors)	4	8
Aluminum Cans & Foil	3	3
Tin Cans	5	3
PET Bottles & Containers	4	3
HDPE Bottles & Containers	4	3
Cardboard	11	29
Newspaper	7	11
High-grade paper	3	13
Mixed & low-grade paper	26	31
<b>Organics</b>	<b>138</b>	<b>116</b>
Yard Waste	39	21
Food Waste	99	95
<b>Other Waste</b>	<b>177</b>	<b>311</b>

**Table B-10. City of Warden**

Served by CDSI

	Residential	Commercial
<b>TOTAL WASTE (tons)</b>	<b>1,323</b>	<b>2,551</b>
<b>Recyclables</b>	<b>242</b>	<b>532</b>
Glass (clear)	12	38
Glass (green)	2	1
Glass (brown and other colors)	12	36
Aluminum Cans & Foil	12	15
Tin Cans	16	15
PET Bottles & Containers	14	16
HDPE Bottles & Containers	15	13
Cardboard	37	139
Newspaper	23	53
High-grade paper	11	60
Mixed & low-grade paper	89	146
<b>Organics</b>	<b>472</b>	<b>549</b>
Yard Waste	132	97
Food Waste	340	452
<b>Other Waste</b>	<b>608</b>	<b>1,470</b>

**Table B-11. All UTC areas and Delano Transfer Station**

	Residential	Commercial
<b>TOTAL WASTE (tons)</b>	<b>14,402</b>	<b>14,544</b>
<b>Recyclables</b>	<b>2,639</b>	<b>3,034</b>
Glass (clear)	127	219
Glass (green)	22	5
Glass (brown and other colors)	132	205
Aluminum Cans & Foil	127	88
Tin Cans	177	83
PET Bottles & Containers	148	91
HDPE Bottles & Containers	165	74
Cardboard	398	790
Newspaper	255	302
High-grade paper	124	343
Mixed & low-grade paper	964	832
<b>Organics</b>	<b>5,142</b>	<b>3,129</b>
Yard Waste	1,438	554
Food Waste	3,704	2,574
<b>Other Waste</b>	<b>6,621</b>	<b>8,381</b>

**Table B-12. CDSI UTC areas**

Unincorporated areas , Coulee City, Hartline, Wilson Creek, and Krupp

	Residential	Commercial
<b>TOTAL WASTE (tons)</b>	<b>13,228</b>	<b>12,000</b>
<b>Recyclables</b>	<b>2,424</b>	<b>2,504</b>
Glass (clear)	117	181
Glass (green)	21	4
Glass (brown and other colors)	121	169
Aluminum Cans & Foil	117	73
Tin Cans	162	69
PET Bottles & Containers	136	75
HDPE Bottles & Containers	152	61
Cardboard	365	652
Newspaper	234	250
High-grade paper	114	283
Mixed & low-grade paper	886	686
<b>Organics</b>	<b>4,723</b>	<b>2,581</b>
Yard Waste	1,321	457
Food Waste	3,402	2,124
<b>Other Waste</b>	<b>6,081</b>	<b>6,915</b>

**Table B-13. Waste Management UTC**

Unincorporated areas

	Residential	Commercial
<b>TOTAL WASTE (tons)</b>	<b>347</b>	<b>1,389</b>
<b>Recyclables</b>	<b>64</b>	<b>290</b>
Glass (clear)	3	21
Glass (green)	1	1
Glass (brown and other colors)	3	20
Aluminum Cans & Foil	3	8
Tin Cans	4	8
PET Bottles & Containers	4	9
HDPE Bottles & Containers	4	7
Cardboard	10	75
Newspaper	6	29
High-grade paper	3	33
Mixed & low-grade paper	23	79
<b>Organics</b>	<b>124</b>	<b>299</b>
Yard Waste	35	53
Food Waste	89	246
<b>Other Waste</b>	<b>160</b>	<b>800</b>

**Table B-14. Delano Transfer Station**

Sunrise Disposal unincorporated areas, Grand Coulee, Coulee Dam, and Electric City; self-haul

	Residential	Commercial
<b>TOTAL WASTE (tons)</b>	<b>827</b>	<b>1,155</b>
<b>Recyclables</b>	<b>152</b>	<b>241</b>
Glass (clear)	7	17
Glass (green)	1	0
Glass (brown and other colors)	8	16
Aluminum Cans & Foil	7	7
Tin Cans	10	7
PET Bottles & Containers	8	7
HDPE Bottles & Containers	9	6
Cardboard	23	63
Newspaper	15	24
High-grade paper	7	27
Mixed & low-grade paper	55	66
<b>Organics</b>	<b>295</b>	<b>248</b>
Yard Waste	83	44
Food Waste	213	204
<b>Other Waste</b>	<b>380</b>	<b>666</b>

**Table B-15. Self-haul Customers**

Ephrata Landfill, Grant County drop-boxes, and CDSI Transfer Station

	Self-haul
<b>TOTAL WASTE (tons)</b>	<b>20,896</b>
<b>Recyclables</b>	<b>1,101</b>
Glass (clear)	235
Glass (green)	8
Glass (brown and other colors)	161
Aluminum Cans & Foil	74
Tin Cans	6
PET Bottles & Containers	57
HDPE Bottles & Containers	22
Cardboard	446
Newspaper	13
High-grade paper	0
Mixed & low-grade paper	78
<b>Organics</b>	<b>4,579</b>
Yard Waste	4,057
Food Waste	522
<b>Other Waste</b>	<b>15,216</b>

**Table B-16. Estimated Percentage Composition of Total Waste for Key Recyclable and Compostable Materials**

Sector	Residential	Commercial	Self-haul
<b>Standard Recyclables</b>			
Glass (clear)	0.9%	1.5%	1.1%
Glass (green)	0.2%	0.0%	0.0%
Glass (brown and other colors)	0.9%	1.4%	0.8%
Aluminum Cans & Foil	0.9%	0.6%	0.4%
Tin Cans	1.2%	0.6%	0.0%
PET Bottles & Containers	1.0%	0.6%	0.3%
HDPE Bottles & Containers	1.1%	0.5%	0.1%
Cardboard	2.8%	5.4%	2.1%
Newspaper	1.8%	2.1%	0.1%
High-grade paper	0.9%	2.4%	0.0%
Mixed & low-grade paper	6.7%	5.7%	0.4%
<b>Other Recyclables</b>			
Magazines & Catalogues	0.7%	1.1%	0.1%
Other Ferrous Metals	4.0%	5.2%	1.2%
Non-Ferrous Metals	0.4%	0.1%	0.2%
Plastic Bags & film	3.8%	6.6%	0.2%
Electronics	0.1%	0.6%	0.6%
<b>Standard Organics</b>			
Yard Waste	10.0%	3.8%	19.4%
Food Waste	25.7%	17.7%	2.5%
<b>Other Organics</b>			
Crop Waste & Manure	0.8%	1.8%	0.0%
Compostable Paper	4.2%	5.8%	0.8%