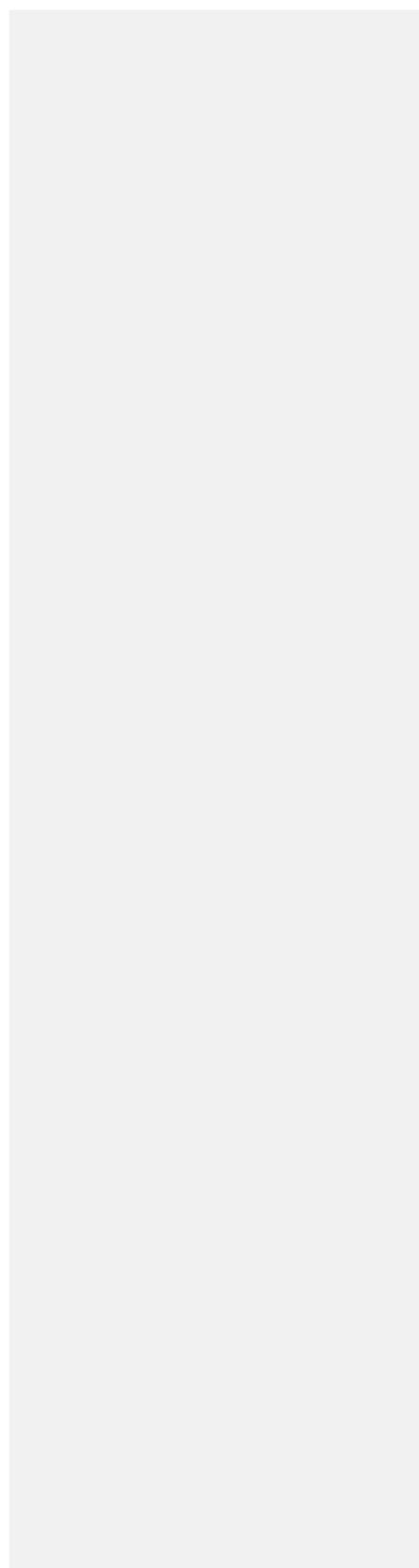


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## **Collection and Processing**

### **Policies**

- CP-1 Provide for efficient collection of solid waste, recyclables, and organics, while protecting public health and the environment and maximizing the diversion of recyclables and organics from disposal.
- CP-2 Promote efficient collection and processing systems that work together to minimize contamination and residual waste, and maximize diversion from disposal.



## Collection and Processing

### Summary of Recommendations

**Comment [HB1]:** Should we consider new tactics to improve diversion from single family, multi-family and non-residential? For example, recycling requirements/mandates, dirty MRFs to process materials, etc.

Responsibility	Action	Detailed Discussion	
<b>Collection – General</b>			
1	County	Work with the Vashon/Maury Island community and service providers to develop the appropriate type of recycling services provided curbside and at the transfer station. Consider including Vashon in the county’s collection service standards for curbside services.	Pages 4-6
2	Cities, county, collection companies, Washington Utilities and Transportation Commission (WUTC)	Explore options to increase the efficiency and reduce the price of curbside collection of bulky items, while diverting as many items as possible for reuse or recycling.	Pages 4-6
3	Cities, county	<del>Educate residents to not dispose of</del> <del>Discontinue the collection of</del> home-generated sharps mixed with garbage both at the curb and at all county transfer facilities; use alternative methods for proper management of sharps.	Pages 4-7
4	County, in cooperation with the cities, collection companies, material processors	Determine how customers should prepare shredded paper for collection and in which cart it should be placed.	Pages 4-10
5	Cities, county	<del>Address space and collection needs of mixed-use buildings</del> <del>Inventory existing code requirements and develop new codes to meet new needs, such as mixed use buildings.</del> <del>Consider code enforcement actions.</del>	Pages 4-22
<b>Material Recovery Facilities</b>			
6	Material recovery facilities	Continue to improve facility sorting and processing equipment and practices to remove contaminants and separate recyclables into marketable commodity grades.	Pages 4-8
7	Cities, county,	Continue to educate customers on proper recycling techniques to reduce contamination	Pages 4-9

**Comment [GJ2]:** Should we change this from “exploring options” to “Develop and implement one system for lower cost more efficient bulky collection in all cities and unincorporated areas.”?

**Comment [GJ3]:** This has still not been resolved. We should try to resolve this in the collection standards and all implement what we decide.

**Comment [GJ4]:** Should we make it clear this applies to compost facilities too?

	collection companies	of recyclables going to the material recovery facilities.	
<b>Responsibility</b>		<b>Action</b>	<b>Detailed Discussion</b>
<b>Single-Family Collection Service</b>			
8	Cities, county, collection companies, WUTC	Adopt the single-family minimum collection standards.	Pages 4-16
9	Cities, county	Increase education and promotion on the recycling of food scraps and food-soiled paper.	Pages 4-16
10	Cities, county, collection companies, WUTC	Continue education and promotion, and consider financial incentives, to encourage recycling and reduce waste.	Pages 4-15
<b>Multi-Family Collection Service</b>			
11	Cities, county, collection companies, WUTC	Update and/or enforce building code requirements to ensure adequate and conveniently located space for garbage, recycling, and organics collection containers.	Pages 4-23
12	Cities, county, collection companies, WUTC	Adopt the multi-family minimum collection standards.	Pages 4-22
13	Cities, county, collection companies, WUTC	Increase education and promotion to encourage recycling and reduce waste	Pages 4-23
14	Cities, county, collection companies, WUTC	Develop an infrastructure and education program for implementing collection of food scraps and food-soiled paper.	Pages 4-23
<b>Non-Residential Collection Service</b>			
15	Cities, county	Update and/or enforce building code requirements to ensure adequate and conveniently located space for garbage, recycling, and organics collection containers.	Pages 4-24

**Comment [GJ5]:** We need to decide if the adopting the collection standards is a requirement or guideline for the cities and the unincorporated areas. Should we say adopt collection standards by a certain date?

**Comment [GJ6]:** Do we want to add a recommendation that says something like: Develop a "MF Recycling Best Practices Handbook/Toolkit" for cities and the county to use to improve their MF programs?

**Comment [GJ7]:** We need to decide if adopting the collection standards is a requirement or guideline for the cities and the unincorporated areas. Should we say adopt collection standards by a certain date?

**Comment [GJ8]:** Should "increase" be changed to: "Provide regular and sustained...to each complex annually"?

Responsibility		Action	Detailed Discussion
16	Cities, county	Continue education and promotion to encourage recycling and reduce waste.	Pages 4-24
17	Cities	Include non-residential recycling services in city contracts (consistent with state law).	Pages 4-24
18	Cities, county, collection companies, WUTC	Promote recycling collection services available in the unincorporated areas and in cities served by WUTC-regulated collection companies.	Pages 4-24
19	Cities, in cooperation with county and collection companies	Develop infrastructure, education, and promotion to increase recycling of food scraps and food-soiled paper.	Pages 4-24
20	Cities, in cooperation with county	Consider developing an incentive-based rate structure for non-residential garbage customers to encourage recycling.	Pages 4-24
<b>Collection and processing of Construction and Demolition Debris (C&amp;D)</b>			
21	County	<del>Continue to explore options to</del> increase the diversion of C&D from disposal <u>through use of designated facilities</u> , particularly for wood, metal, cardboard, asphalt shingles, carpet and gypsum wallboard.	Pages 4-25
<u>21A</u>			
22	Cities, county	Encourage contractors and homeowners to use at least two containers on construction, demolition, or remodeling sites – one for garbage and one for mixed recyclables – and if there is sufficient space, to sort individual recyclables on site to maximize diversion from disposal.	Pages 4-26

**Comment [GJ9]:** We can discuss the new system in the narrative. We hope to increase diversion of C&D through use of C&D processing facilities and materials bans.

**Comment [SWD10]:** Look into curbside collection of small dimension C&D waste that would support 2 bin jobsite recycling requirements.



## COLLECTION AND PROCESSING

### Garbage–Recyclables–Organics–C&D

The system for curbside collection of garbage is well established in King County. Garbage collected by private- and public-sector solid waste collection companies is taken to county transfer stations, where it is consolidated and transported to the Cedar Hills Regional Landfill (Cedar Hills) for disposal. The addition of recyclables to curbside collection programs has required the development of a more complex infrastructure for collecting and transporting recyclables and organics, and additional capacity for processing the materials collected.

With the Waste Not Washington Act of 1989, the state established waste prevention and recycling as the highest priorities for managing solid waste. In so doing, the legislature established a framework for making recycling services available to residents across the state. In King County, the division, cities, Washington Utilities and Transportation Commission (WUTC), solid waste collection companies, and material recovery facilities (MRFs, pronounced "merfs") worked together to launch a coordinated system for curbside collection and processing of recyclables throughout the region.

Since the *2001 Comprehensive Solid Waste Management Plan* was adopted, the collection and processing system in the region has evolved significantly. The number of materials that can be recycled or processed for recycling and reuse has increased, technologies for collecting and processing materials have improved, and participation in curbside recycling has continued to climb.

#### ***Insert I-4.1***

*Commingled collection makes recycling easier and leads to increased participation.*

Two key developments have added to the success of single-family residential curbside recycling in the region. First is the transition to commingled (or single-stream) collection. Since 2001, the collection companies have transitioned to commingled recycling, whereby all the recyclable materials are placed in one large cart for curbside pickup. This shift to commingled collection is possible due to the use of more advanced sorting systems at the MRFs, which allow the mixed loads to be separated by commodity in preparation for market. By making it easier and more convenient for individuals to recycle, the per capita recycling rate and overall amount recycled ~~have~~ increased significantly ~~from 2003 - 2007~~. In addition, the transition has made curbside collection more efficient for the companies that provide this service.

A second development is the addition of food scraps and food-soiled paper to yard waste collected curbside. In 2001, the division began working with the cities and collection companies to phase in curbside collection of food scraps and food-soiled paper in the yard waste cart. Compostable food scraps and food-soiled paper, which currently make up about one-third of the waste disposed by single-family residents, include all fruit, vegetable, meat, and dairy products, pastas, grains, breads, and soiled paper used in food preparation or handling (such as paper towels). When these materials are combined with yard waste for collection, the mixture is referred to as organics. Nearly 100 percent of single-family customers who subscribe to garbage collection now have access to curbside food scrap collection. Only Vashon Island and

the Skykomish and Snoqualmie Pass areas, which house less than one percent of the county's residents, do not have this **service**.

**Comment [MJ11]:** We will update with new organics waste characterization data. Available end of Feb?

The primary processor for nearly all yard waste, food scraps, and food-soiled paper collected in the county is Cedar Grove Composting, Inc., with facilities in Maple Valley and Everett. Cedar Grove not only processes organic materials into compost, but offers collection of organics to area businesses and sells the finished compost locally. A new processor, Pacifclean in Quincy Washington, will process sixty percent of Seattle's organic materials. The remaining forty percent is composted by Lenz in Stanwood, Washington. A growing number of cities now offer organics collection to businesses through their existing curbside collection **contracts**.

**Comment [MJ12]:** Update discussion about organics contamination issues.

In addition to these major developments, **some** markets are growing for the recycling and reuse of construction and demolition debris (C&D). C&D collection and processing facilities are capturing valuable wood, metals, plastics, and other materials from **home remodeling projects and commercial** construction and demolition projects throughout the region. Programs such as Leadership in Energy and Environmental Design (LEED) and Built Green™ are also focusing the building community on waste prevention, recycling, and reuse of C&D materials.

Figure 4-1 provides a general overview of the collection, transportation, and processing systems for garbage, recyclables, organics, and C&D. Garbage is transported to Cedar Hills for disposal, while recyclables, organics, and most C&D materials are taken directly to processing or compost facilities where materials are prepared for sale to manufacturers and other users. As shown, these recycled or composted products eventually return to the market for consumer purchase.

#### **Insert I-4.2**

*Garbage collected curbside in commercial collection trucks is taken to county transfer stations for consolidation and transport to the Cedar Hills Regional Landfill.*

As can be seen in Figure 4-1, this multi-faceted system uses the combined resources of the public and private sectors. Regulations and systems for collection and transport that come into play are complex, involving state, county, city, and private-sector responsibilities. The following section describes the rules that govern these important processes in solid waste management.

#### **Insert Figure 4-1. Solid waste management system in King County**

**Comment [MJ13]:** Graphic could also include an icon representing reuse facilities like goodwill, northwest harvest etc. Not really captured here.

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

## THE MECHANICS OF COLLECTION AND PROCESSING

### Collection of Solid Waste and Recyclables

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

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

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

#### **Insert I-4.3**

#### **Revenue Sharing Provides Incentive for Collection Companies to Enhance Recycling**

In 2010, the state legislature amended statute (RCW 8177.185), allowing solid waste collection companies regulated by the WUTC to retain up to 50 percent of the revenue paid to them for the recycled materials they collect from households. (The statute does not apply to collection in cities with contracts for recyclables collection.) The purpose of the statute is to provide collection companies with a financial incentive to enhance their recycling programs. Formerly, all revenues from the sale of residential recyclables were passed back to the households as a credit on their garbage bills.

To qualify for the revenue sharing, collection companies must submit a plan to the WUTC that has been certified by King County as consistent with the current comprehensive solid waste management plan. The Solid Waste Division Director has authority to make this certification.

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

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

As of January ~~2013~~2015, all WUTC-regulated areas of King County, except Vashon Island, have certified agreements in place.

For each city and unincorporated area in King County's service area, Table 4-1 (provided on page 4-18) lists the collection company that serves the area, along with WUTC tariff numbers, where applicable. The WUTC cost assessment in Appendix A (Section 3.3) provides additional information about the WUTC-regulated and contracted companies, such as G-certificate information.

There is a fundamental difference in how the WUTC regulates residential and non-residential collection of recyclable materials. The Federal Aviation Administration Authorization Act of 1994 prohibits regulation of price, route, or service of any motor carrier transporting property. While this provision does not apply to collection of garbage and recyclable materials from residents, recyclable materials generated by the non-residential sector are considered to be property and are subject to a different regulatory structure. King County cannot enact ordinances that require commercial garbage collectors to include recyclables collection as part of the non-residential collection service. Cities, on the other hand, may include recyclables collection as part of their non-residential collection service, but cannot prohibit businesses and other non-residential entities from choosing other vendors for this service.

More and more cities are adding non-residential recycling services to their collection contracts. While residential recycling has increased steadily over the years, growth in recycling by businesses, institutions, and government entities has been less consistent. Cities that provide recycling as part of their basic collection services provide a financial incentive for businesses to recycle and make recycling more convenient.

**Comment [GJ14]:** We will add a column to Table 4-1 to list cities that include commercial recycling

### Curbside Collection in Rural Areas

~~When curbside recycling was initiated in King County in the early 1990s, the collection companies (operating under WUTC certificates) that serve unincorporated areas were required to provide curbside recycling services as specified in KCC 10.18 for most of the county. These requirements, consistent with the 1989 Comprehensive Solid Waste Management Plan, stated that curbside recycling would be offered to all households as part of the basic garbage service,~~

and that yard waste service would be available to all households as a subscription service. However, some rural areas were exempted from these requirements because their low population density or lack of participation in garbage collection services suggested that in the rural areas of King County make curbside recycling might not be less cost effective.

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

- **Vashon/Maury Island** – Historically, a comparatively high percentage of Vashon/Maury Island residents have chosen to self-haul garbage and recyclables to the division's Vashon Recycling and Transfer Station; however, the number of households subscribing to garbage service has increased over time. Waste Connections, the company providing garbage collection service on Vashon/Maury Island, also offers subscriptions to recyclables collection services. From a survey of Island residents (KCSWD, 2010c), about 13 percent currently subscribe to curbside recycling services. Organics collection is not available, however an organics collection pilot at the Vashon Recycling and Transfer Station starting in 2015 will target yard, food, and wood waste to measure expected tonnages of this material that could be composted (on or off island) in the future.
- **Skykomish Area** – The area around Skykomish is remote and sparsely populated. Residents of Skykomish and some residents in surrounding unincorporated areas receive curbside garbage collection service from the Town of Skykomish. Skykomish does not collect curbside recyclables or organics. Customers may self-haul garbage and recyclables to the division's drop box facility located in Skykomish; however, separate organics collection is not provided at the facility.
- **Snoqualmie Pass** – The Snoqualmie Pass area is also very sparsely populated. Residential garbage collection is available from Waste Management of Ellensburg in Kittitas County. Curbside recycling is not available; however, the division does provide collection bins for the standard curbside recyclable materials. Organics collection is not available.

Comment [GJ15]: We will update this with customer counts from Waste Connections

Comment [HB16]: Check – Isn't Skykomish collecting recyclables?

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

### Curbside Collection of Bulky Items for Residents

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

Bulky waste collection services are available from collection companies throughout the county; however, these services are not widely used. Residents may not use the service because it is expensive, ranging from \$25 to \$100 per item, with the possibility of additional charges for travel time and labor. Customers may also be unaware of the collection options available to

them. The primary alternatives to bulky curbside collection are self-hauling the materials to transfer stations for disposal or recycling, or taking them to collection events sponsored by the county or the cities. Neither of these self-haul options is an efficient way of handling the materials because of the number of vehicle trips, the increased number of transactions at transfer stations, and the high cost of staging collection events.

The current recommendation is to work with collection companies and the WUTC to explore options to increase the efficiency and reduce the price of curbside collection of bulky items. For example, the cost would be lower if a small charge were included in the regular garbage fee, and curbside collection days were regularly scheduled and promoted, thereby increasing the efficiency of the collection routes. Collection systems for bulky items should be designed, to the extent possible, to divert reusable items to charitable organizations for resale and recyclable items to processing facilities.

**Comment [GJ17]:** We understand that SeaTac and Burien have started this in their new contract. We should add a description of what they're doing; what the charge is for the customers We should discuss whether we need to explore other options or just say we want to implement bulky collection this way countywide.

## Collection of Sharps

Sharps are medical products, such as hypodermic needles, scalpel blades, and lancets, which require special handling to ensure their safe collection, transfer, and disposal. Without proper containment, sharps can pose a safety hazard to workers through potential exposure to blood-borne pathogens or other disease-causing agents. Within King County, the disposal of sharps is regulated by Title 10 of the Code of the King County Board of Health and by King County's Waste Acceptance Rule (PUT 7-1-5 [PR] 6/05).

***Insert I-4.4- need new photo*** The division will provide separate sharps receptacles at new transfer facilities, where practicable.

Separate, secure receptacles for sharps collection are provided for residents and small businesses at the Vashon Recycling and Transfer Station and for residents only at the Shoreline and Bow Lake Recycling and Transfer Stations. Business-generated sharps are not accepted at the transfer facilities, except at Vashon with prior permission-written approval from the division's Special Waste Unit. Sharps generated by medical facilities or businesses are accepted for disposal at Cedar Hills with permission-written approval from the Special Waste Unit.

If contained in a properly marked, two-liter polyethylene terephthalate (or PET) plastic bottle, home-generated sharps are currently accepted with the garbage at the curb and at division transfer facilities. Until recently, PET bottles were considered the best available and affordable container for home-generated sharps. The PET bottles, however, are now being manufactured with thinner plastic while heavier equipment and new processes at solid waste facilities are allowing greater compaction of garbage. Together, these factors make it more likely that the PET bottles that contain the sharps could break during handling. An additional problem is customers putting bottles containing sharps into recycling. Both the Centers for Disease Control and the U.S. Environmental Protection Agency have withdrawn support for the PET method of containment because of the exposure risks to workers.

Because of these risks, this plan recommends that the county and the cities stop accepting sharps mixed with garbage at the curb or at any transfer facility. This recommendation is consistent with the policies of other regional governments, federal agencies, and at least one of the major solid waste collection companies in the region.

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

## Processing of Commingled Recyclables

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

### *Insert I-4.5*

*At a local MRF, sorted paper moves on to be baled for shipment to manufacturers and other end users.*

The processing of recyclable materials into new commodities begins at a MRF. MRFs receive material loads from the commercial collection trucks, remove contaminants from the loads, sort materials to meet the specifications of the end users or markets, and compact or bale the material for efficient shipping. As the residential collection system has moved to commingled collection, MRFs in the region have upgraded their facilities to improve their ability to remove contaminants and sort materials into marketable commodity grades. Any residuals, or non-recyclable waste products, from recyclables processing facilities within the King County service area must be disposed of at a King County solid waste facility.

The processing of recyclables throughout the Pacific Northwest is currently handled through the private sector. Companies that collect recyclables curbside are required by contract or ordinance to deliver them to recycling facilities. Local facilities receive recyclable materials from the region as well as from other areas of the U.S. These private-sector facilities have made necessary upgrades over time to expand processing capacity to meet demand. The two largest Each of the major collection companies in King County – Waste Management and Recology CleanScapes, Republic Services and Waste Management – each own a MRF located within the county to process most of the recyclable materials they collect.

- Recology CleanScapes' new MRF (Seattle, WA). Receives residential recycling from the cities of Burien, Carnation, Des Moines, Issaquah, Maple Valley, SeaTac, and Shoreline.
- Republic's 3rd & Lander (Seattle, WA). Receives residential recycling from Auburn (annexation areas only), Beaux Arts Village, Bellevue, Black Diamond, Clyde Hill, Covington, Hunts Point, Issaquah (South Cove), Kenmore, Kent, Lake Forest Park, Maple Valley (annexation area), Medina, Mercer Island, Normandy Park, North Bend, Ravensdale, Sammamish (S Area: N of Inglehill Rd), Seattle, Yarrow Point, unincorporated areas of northeast King County near Preston and Fall City, and unincorporated areas of southern King County near Renton, Auburn, and Kent.
- Waste Management's Cascade Recycling Center (Woodinville, WA). Receives residential recycling from Bothell, Duvall, Kirkland, Newcastle, Redmond, Renton, Snoqualmie, Tukwila, and Woodinville, and unincorporated areas east of Redmond.

**Comment [GJ18]:** This just talks about processing of commingled recyclables at MRFs. Should we add a section about processing of organics given the extra screening at compost facilities and the contamination issues?

- Waste Management's JMK Fibers (Tacoma, WA). Receives residential recycling from Auburn, Algona, Enumclaw, Federal Way, Pacific, and unincorporated areas in southeast King County.

Waste Management's Cascade Recycling Center was designed and constructed in 2002 as part of their transition to fully commingled recyclables collection. Republic's Recycling Center in south Seattle was substantially redesigned in 2007 to improve its ability to sort commingled materials, and in 2008 was upgraded to expand capacity. MRFs in the region have been making major infrastructure investments to improve the quality of their outbound products. Facilities are installing more sophisticated equipment in order to recognize and sort items from a more complicated incoming materials stream; comply with new contracts and Green Fence requirements; and respond to markets that are becoming more sensitive to contamination (Cascadia Consulting Group, 2015).

Other MRFs processing commingled recyclables in the area include Smurfit Recycling in Renton, JMK Fiber in Pierce County, and Tacoma Recycling, which processes materials collected curbside on Vashon Island. In 2007, SP Recycling in Thurston County constructed a new 70,000-square-foot, single-stream recyclables processing facility. The division expects that the private sector will continue to expand processing capacity for commingled recyclables as the need arises. According to the 2015 King County Recycling Markets Study (Cascadia Consulting Group, 2015), the region currently has some excess processing capacity. When interviewed for the study, most processors reported operating at only partial capacity: between 50 percent and 85 percent. One processor estimated that there is 20 percent capacity available overall in the regional commingled curbside recyclables processing system.

In addition to the facilities described above, numerous other private-sector facilities have emerged/operate across the county where individual residents and businesses can bring source-separated recyclables, from including paper, cans, and bottles, electronics, fluorescent tubes and bulbs, Styrofoam, printer cartridges, and cellular telephones, for processing.

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

For the processing of commingled recyclables to be most efficient, it is important that consumers are careful about preventing contamination in the recycled loads by 1) preparing

recyclables for the collection cart (i.e., rinsing out bottles and jars, breaking down cardboard boxes) and 2) placing materials in the proper collection container. Contamination in the recyclables can cause a wide array of problems during processing, which can lead to a reduction in the value of the materials processed for market or, in extreme cases, the disposal of entire mixed loads. This issue can best be remedied through education programs offered through local governments and the collection companies on proper recycling techniques.

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

There are materials that present unique challenges or require more definitive decisions about the optimal way to process them, such as container glass and shredded paper:

**Container Glass** – With the advent of single-stream recycling, glass is being collected in the same cart as other recyclables. While commingled collection is more efficient for the collection companies, it does create some challenges for the processors. Glass containers ~~are often broken~~ break as they are loaded into the collection trucks or when the collection trucks dump the materials at the MRF, which causes added wear and tear on the equipment. When the glass breaks into very small fragments during processing it can limit the markets for these materials (e.g., the glass may not be suitable to be made into new glass containers). In addition, the glass ~~sometimes gets into the paper stream where it contaminates the paper bales.~~

~~However, the efficiencies of commingled collection currently far outweigh the benefits of separating the glass from the other recyclables at the curb. Thus, A new glass processor, Strategic Materials opened a facility in May 2014 that is co-located with the Ardagh Group bottling plant. Strategic Materials is working with local MRFs the MRFs have been working to minimize contamination of the paper stream by glass and are exploring new and higher value in the cullet markets for the glass by removing glass earlier in the process.~~

**Shredded Paper** – The risk of identity theft has caused increasing concern about discarding personal or confidential documents. As a result, shredding these kinds of papers is now common. Loose shredded paper causes problems at MRFs where it can jam machinery and be difficult to sort from other material streams. Finely shredded (cross-cut) paper fibers cannot be recycled at all, making them a nuisance at processing facilities.

Some recycling companies have tried to address their customers' interest in recycling shredded paper by providing special on-site shredding/recycling services for businesses or instructing customers to place shredded paper in clear plastic bags or paper bags for collection, which makes it easier for the material to be handled separately at the MRF. Some residents have been instructed to layer shredded paper in their yard waste cart. This method can create two potential problems: 1) shredded paper not properly layered with the organics can cause a litter problem at the composting facility and 2) too much paper received at the facility can create an imbalance in the carbon-to-nitrogen ratio which is necessary to make compost.

**Insert I-4.6**

*Shredded paper presents challenges for collectors and processors.*

Because of the problems of collecting and processing this material and because information given to customers about how to handle this material is inconsistent, the cities and the county will be working with the collection companies and processors to clearly determine how customers should prepare shredded paper for collection and in which cart it should be placed. The answers may be different for residential collection versus non-residential collection, where the volumes could be much greater.

**RESIDENTIAL COLLECTION**

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

**Insert I-4.7**

*Curbside collection has become more automated over time.*

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

To illustrate the varying collection standards that currently exist, Table 4-1 presents a summary of single-family collection services by city and unincorporated area, showing the various types of contracts held, container sizes offered, collection frequency, and fee structures. The recycling rates for each jurisdiction and unincorporated area, with and without organic materials, are also presented for comparison.

As shown in the table, the single-family recycling rate varies significantly among the cities and unincorporated areas, ranging from 35 to 66 percent from 7 to 65 percent (combining organics and the curbside recyclables). While it would be difficult to identify a single factor or factors that will ensure a higher recycling rate, there are some factors that appear to lead to increased participation and amounts of waste diverted from disposal, as discussed in the following sections.

## Range of Materials Collected

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

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

- **Plastic bags** and plastic wrap are prevalent in the waste stream, particularly residential. Collection of plastic bags in the recyclables cart creates a nuisance further down the line at the MRFs. As the bags move through the facility they sometimes catch in and jam the sorting machinery, and they can blow around and cause litter problems. For these reasons, curbside collection may not be the best option for plastic bags at this time. More appropriate options for consideration may be an increased use of reusable shopping bags and the establishment of take-back programs at the retail level.

### **Insert I-4.8**

*As an authorized E-Cycle Washington collector, Total Reclaim of Seattle accepts televisions and other electronics for recycling.*

- **Electronic Products and Fluorescent Bulbs and Tubes** – Collecting these materials at the curb is complicated by the fact that some of them tend to break easily and contain potentially hazardous materials that must be safely disposed. In Washington Sstate, legislation requires manufacturers of computers, monitors, and televisions to provide separate locations for free recycling of these items. Handling electronics through product stewardship ensures that the various components, such as glass, plastic, and metals, are separated and recycled as appropriate and that any potentially hazardous materials are recycled or disposed in a safe and environmentally sound manner. Product stewardship efforts reduce costs to local governments and their ratepayers by eliminating the costs to recycle these products. Take-back programs have also been implemented for fluorescent bulbs and tubes. Cities such as Shoreline and Kent have contracted with their recycling collection companies to develop a safe, convenient program for collecting fluorescent bulbs and tubes at the curb.

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

**Comment [GJ19]:** We should raise the policy question of: before materials are added to a program, we develop a process to determine best way to collect the material? Can it be processed? Are there markets? If we agree, that could be an additional recommendation or be added to the Collection Standards

**Comment [HB20]:** Include discussion of plastic bag bans. Document which KC cities have bag bans and what the impacts have been

**Comment [HB21]:** Update to reflect eCycle WA and LightCycle,WA

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

Comment [HB22]: Any other cities?

### Size of Collection Container

The size of the recycling collection cart can affect recycling success. Larger carts generally lead to higher recycling rates. As more materials are identified for commingled recycling, and food scraps are added to the yard waste cart, recyclables carts are getting larger and the size of garbage can to which customers subscribe should become smaller. Areas where most residential customers use smaller recycling carts- have shown lower recycling rates. When larger carts have been provided the recycling rate has increased. Also, providing smaller cart options for households that have food scraps, but may not generate much yard waste could increase participation in curbside food/yard recycling programs.

### Frequency of Collection

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

One of the most important factors in determining the appropriate collection frequency for the various material streams, particularly for organics (yard waste and food scraps), is compliance with the public health and environmental standards in Title 10 of the Code of the King County Board of Health. To study the effects of changing the collection method and possibly the frequency of collection, in summer 2007 the division conducted a pilot study in cooperation with the City of Renton, Waste Management (the collection company), and Public Health. The purpose of the study was to explore the public health and environmental impacts, customer

Comment [GJ23]: We will update this section to delete discussions about the “study” and more about the impacts of Renton moving to EOW 6 years ago.

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

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

### **Regulatory Changes Allow Adjustments in Collection Frequency Schedules**

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

#### **Residential (Single-Family) Garbage Collection**

Residential garbage may be collected every other week provided that:

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

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

- When mixed with yard debris, residential food scraps may include all vegetative, meat, dairy products, pastas, breads and soiled paper materials used for food preparation or handling; provided that all collected materials are picked up by haulers which deliver the mixed yard waste to a permitted transfer and/or permitted composting facility for serviced customers.
- Combined food scraps and yard debris shall be collected no less frequently than every-other-week, year-round provided that there are no leachate generation, odor or vector problems.
- Combined food scraps and yard debris shall be collected in carts. Residents shall be instructed to place food scraps only in the cart provided to them. Any extra customer-provided cans or large paper bags shall contain only yard debris.

- Compostable bags may be used to consolidate food scraps placed in carts if and only if the bags have been approved by the facility receiving the material for composting. Plastic bags shall not be used for yard debris.
- Haulers shall make available a cart-cleaning or replacement service for customers with carts which have unacceptable residue or odor levels to avoid improper disposal of rinse water to storm drains, yards, etc. and reduce the need for customers to self-clean their containers.
- Educational and promotional materials from the county, city, and haulers shall inform residents about the benefits of recycling food scraps and soiled paper; appropriate options for managing kitchen waste, including the use of approved compostable bags; and appropriate options and restrictions for cleaning carts.

Based on a separate commercial pilot, an additional variance is under review by Public Health to allow collection of non-residential and multi-family organics that are not mixed with yard waste.

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

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

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

As a precursor to **changing** the Title 10 Health Code based on the successful results of the pilot study, Public Health approved a variance that would allow all organics and garbage to be collected less than weekly (see page 4-~~14XX~~). As a result, the City of Renton rolled out a

**Comment [MJ24]:** Code has not changed. Awaiting response from Health Dept on update

citywide program in January 2009 to offer every-other-week collection of garbage and commingled recyclables, with every week collection of organics.

Renton is the first city in King County to provide every-other-week garbage collection as the standard collection service for single family households. By the third year of the program, disposal per household had dropped by 25 percent. While other factors such as the economic downturn likely played a role in disposal reductions, data from all of King County over the same time period estimated a disposal drop of 7 percent, suggesting that every-other-week garbage is a significant tool to reduce disposal and increase recycling.

**Comment [SWD25]:** Update with more recent data.

## (Add Section) Mandates and Bans

### Fee Structure

In nearly all areas of King County, households paying for garbage collection services are also required to pay for recycling collection. The fee for recycling services includes the cost of the recycling containers and, in most cases, the ability to set out unlimited amounts of recyclables for the same flat fee. In contrast, the fee for garbage service varies depending on the number or size of containers a household sets out.

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

**Comment [HB26]:** Should we add a section that discusses "Mandates or Bans" and talk about the SF YW disposal ban that resulted in a 97% recovery rate for YW?

Ten-Thirteen cities, comprising about 35.42XX percent of the single-family households in the county, have adopted rate structures that embed the cost of organics collection in the curbside garbage collection fee, providing a further incentive for residents to reduce disposal and maximize use of the recycling options for which they are paying. In 2011-2014, the average pounds of garbage disposed per household in these ten-thirteen cities was 17-XX percent lower than the average for the rest of King County.

**Comment [HB27]:** Update

### Target: 45 Percent for Single-Family Curbside Recycling

The waste prevention and recycling goals are countywide goals that are not calculated on a city-by-city basis. However, the rate for single-family curbside recycling, which is reported to the division and the cities by the collection companies, can be measured for each city and unincorporated area. If every city and unincorporated area in King County were to achieve at least a 45 percent single-family curbside recycling rate (excluding organics) by 2015, we will have diverted an estimated additional 230,000 tons of material from disposal at the Cedar Hills Regional Landfill.

Recycling rates for each city and unincorporated area can vary widely – from a high of 42 percent to a low of 17 percent in 2011, with most falling somewhere in the range of 30 to 40 percent (excluding organics). Reaching a target of at least 45 percent curbside recycling can be achieved through a combination of producing less garbage and recycling more. For a city or unincorporated area with a lower recycling rate, one of the best ways to improve the rate would be to adopt the recommended minimum collection standards outlined in detail on page 4-17.

**Comment [GJ28]:** We should discuss if this is still the right target. Need to sync up with what our final recommendations are (e.g., if we do bans, do we need this target).

It should be noted that a lower recycling rate is not always a negative outcome. The simultaneous reduction of both garbage and recyclables can be a positive outcome – it may mean that overall waste generation is decreasing through waste prevention.

### Single-Family Residential Collection

Single-family collection services for garbage, recyclables, and organics are well established. As discussed earlier, however, there are many variations among the cities in the specific methods of collection and rate structures. The division has evaluated the factors that appear to lead to higher recycling rates and an increase in the diversion of materials from the garbage. Based on this evaluation, it is recommended that minimum collection standards be adopted by the cities and unincorporated areas to provide the optimal service level for reducing waste and increasing the diversion of recyclables and organics from disposal. Establishing minimum collection standards countywide will help to 1) meet a target of 45 percent single-family recycling by 2015 (not including organics), 2) lead to more efficient operations by standardizing services, and 3) clarify what or how materials are collected through more consistent messaging regionwide.

Comment [HB29]: Update

Large increases in recycling rates have occurred when the county and the cities have taken collective action at the same time. Starting curbside recycling and yard waste collection programs, coupled with a yard waste disposal ban is an example. The collective impact of single stream recycling also resulted in higher recycling rates. The new minimum collection standards can be implemented as the county updates its service-level ordinance and jurisdictions amend their collection contracts (some changes may not require changes to contracts). A description of the recommended collection standards follows.

Continuing education and promotion will also be important for increasing recycling and reducing wastes generated by single-family residents. The cities and the county will increase education and promotion to encourage the recycling of food scraps and food-soiled paper. In concert with the commercial collection companies, the cities and the county will also continue to focus promotions on the proper recycling of the standard curbside materials to increase participation and reduce contamination in the recycling containers. Financial incentives will also be explored through the fee structure for garbage and recyclables and grants to cities (discussed in Chapter 3).

### Single-Family Minimum Collection Standards

Comment [GJ30]: Do we want the standards to include the possibility of disposal bans? Or do we say: implement collection standards and if X% recycling rate is not achieved by a certain date, mandatory will be implemented?

	Garbage	Recyclables	Organics
<b>Required Materials for Collection</b>	Mixed solid waste	Newspaper, cardboard, mixed paper, and polycoated paper Plastic bottles, jugs, and tubs Tin and aluminum cans Glass bottles and jars Aseptic packaging Small scrap metal Shredded paper <sup>a</sup>	Yard debris Food scraps Food-soiled paper Shredded paper <sup>a</sup>
<b>Container Type</b>	Containers or	Wheeled carts	Wheeled carts

	wheeled carts		
<b>Container Size</b>	Subscriptions available for various sizes	60+ gallon if collected weekly 90+ gallons if collected every other week Smaller size if requested by customer	60+ gallons if collected weekly 90+ gallons if collected every other week Smaller size if requested by customer
<b>Frequency of Collection</b>	Every other week	Weekly or every other week	Weekly or every other week
<b>Fee Structure</b>	Fee increases with container size	Recyclables collection included in garbage fee Additional containers available at no extra charge	Organics collection included in garbage fee Additional carts may be included in base fee or available at an extra charge Customers requesting smaller carts may be offered a reduced rate

**Comment [GJ31]:** We may want to revisit if 60g carts are adequate for weekly collection

<sup>a</sup> The cities and the county will be working with the collection companies and processors to determine how customers should prepare shredded paper for collection and in which cart it should be placed.

**Comment [GJ32]:** We should determine this now and decide where shredded paper should go.

**Insert Table 4-1 Summary of 2013~~4~~ single-family collection services in King County**

**Multi-Family Residential Collection**

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As discussed in Chapter 3, *Waste Prevention and Recycling*, multi-family recycling has not been as successful as single-family recycling. There are a number of contributing factors, including space constraints for collection containers and a higher turnover of residents and property managers. These factors make it difficult to implement standardized collection services and provide consistent recycling messaging to this diverse sector.

In addition, in many areas of the county there is an ever-growing trend in the construction of mixed-use buildings, which contain retail shops on the lower level and residential units above.

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

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

Recycling could be increased substantially at multi-family complexes and mixed-use buildings by adopting the new minimum collection standards for multi-family collection, [along with regular and sustained technical assistance](#). The multi-family standards vary somewhat from the single-family standards to account for differences in service structure. To improve recycling at mixed-use buildings, the cities and the county must consider both the multi-family collection standards and the recommendations for non-residential collection. [A description of the recommended collection standards follows.](#)

### Multi-Family Minimum Collection Standards

**Comment [GJ33]:** No changes to these standards except for deciding now about shredded paper and whether or not we include mandates in the standards, similar to single family standards

	Garbage	Recyclables	Organics
<b>Required Materials for Collection</b>	Mixed solid waste	Newspaper, cardboard, mixed paper, and polycoated paper Plastic bottles, jugs, and tubs Tin and aluminum cans Glass bottles and jars Aseptic packaging Small scrap metal Shredded paper <sup>a</sup>	Yard debris Shredded paper <sup>a</sup>  Optional: Food scraps Food-soiled paper
<b>Container Type</b>	Wheeled carts or dumpsters	Wheeled carts or dumpsters	Wheeled carts or dumpsters
<b>Container Size</b>	Subscriptions available for various sizes	Container with at least 150 percent of garbage container capacity  Smaller size if requested by customer	60+ gallons if collected weekly  90+ gallons if collected every other week  Smaller size if requested by customer
<b>Frequency of</b>	Weekly, or	Weekly or every other week	Weekly or every

<b>Collection</b>	more often if needed		other week
<b>Fee Structure</b>	Fee based on container size and/or collection frequency	Recyclables collection included in garbage fee  Additional containers available at no extra charge	Subscription service available for an added fee

<sup>a</sup> The cities and the county will be working with the collection companies and processors to determine how customers should prepare shredded paper for collection and in which cart it should be placed.

~~Increased~~ Sustained education and promotion are needed to improve recycling at multi-family complexes. In 2007-2008, the division conducted a pilot education campaign to increase recycling in large multi-family complexes in the county. Study results indicated the need to overcome some fundamental challenges in order to increase recycling.

**Comment [GJ34]:** Update to include examples from cities and unincorporated areas.

Following the pilot outreach program, to further the division’s understanding of multi-family outreach and successful tactics used to increase recycling in multi-family, the division, in partnership with Waste Management, conducted research to study tactics and strategies used nationally and internationally which may be implemented successfully by the division and cities in King County. [The Multifamily Recycling Pilot \(King County and Waste Management, 2013\)– studied methods to increase recycling in multifamily complexes in the unincorporated area.](#)

The research project report, [The Multifamily Recycling Case Studies on Innovative Practices from Around the World](#) is part of a series of activities being carried out in Washington State to learn more about recycling in multi-family complexes and to improve recycling rates in the multi-family sector. The other activities which are being planned to further characterize multi-family recycling are:

**Comment [GJ35]:** This report could become the basis to identifying “best practices” for MF that we could all use to work on improving MF recycling.

- Washington State Recycling Association’s Multifamily Recycling Study Group (WAMRS) surveys:
  - A survey of county and city multifamily recycling programs
  - A survey of multifamily property managers
  - A national literature review
 The WAMRS Report will be released in the summer 2013.
- King County multi-family outreach and education pilots will be implemented in target complexes in King County WUTC areas, which have large Hispanic/Latino tenant populations. The planning for these pilots is underway and the pilots will be started in 2013.

**Comment [MJ36]:** We have pilot study reports to add new information

Increasing multi-family recycling will require concerted efforts on the part of many to standardize the collection infrastructure and provide ongoing education and promotion for property managers and residents alike.

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

- **Clarify and strengthen building code requirements** – The county and the cities should inventory existing code language and update and/or enforce building code requirements to ensure there is ~~adequate conveniently~~adequate, conveniently located space for garbage, recycling and organics containers.
- **Research collection and demographic characteristics complex by complex** – Planning outreach strategies should begin with a careful look at language and other population demographics, collection infrastructure, tenant turnover rate and other applicable characteristics of each complex. Outreach strategies must be comprehensive and flexible to fit the complex. Customized combinations of outreach tactics and education reinforcement, designed to address the researched characteristics of that complex, help ensure successful outreach which will increase recycling and decrease contamination.
- **Provide manager and maintenance staff education** – Involvement and support from the property manager and staff is important to the long-term success of multifamily recycling. The institutional knowledge which property managers can provide and the role they play in delivering education to each tenant and at each container are important considerations. This function should be supported with training and materials.
- **Provide ongoing recycling education for residents** – Recycling education needs to be provided on a continuing basis because most multi-family complexes have high tenant turnover. Providing education materials in the lease and at least annually coupled with information through newsletters and posters ensure that residents get the message and it's reinforced on a regular basis.
- **Involve collection companies to assist with service improvements and education** – The collection company should be involved to provide insight and information about complexes' recycling infrastructure systems and to help with education outreach and feedback to the tenants about the quality of the recycling and level of contamination. Companies should monitor the recycling performance of the complexes and tag or refuse pickup of loads that are contaminated.
- **Expand organics collection** – Currently, only a few cities are offering collection of food scraps and food soiled paper to multifamily residents. The cities and the county will need to work with the collection companies to determine what containers and collection methods will work best for multifamily complexes. Education and promotion will be a critical component of the new multifamily food scrap collection programs.

**Comment [GJ37]:** These are all “best practices” which could lead us to include in the recommendations to “develop a best practices handbook”

#### **Insert I-4.9**

### **NON-RESIDENTIAL COLLECTION**

The non-residential sector comprises a range of businesses, institutions, and government entities from manufacturing to high-tech and retail to food services. This sector has achieved recycling successes in the last few years, with a recycling rate of 67 percent in 2012 2011-

Unlike the residential waste stream, the types of materials discarded by the non-residential sector differ widely from business to business. Thus, the recycling potential for any particular

business or industry can vary greatly. For example, restaurants and grocers are the largest contributors of food scraps, while manufacturers may generate large quantities of plastic wrap and other packaging materials.

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

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

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

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

Comment [HB38]: Check and update if needed

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

Another strategy that might increase recycling for some business customers is to consider a rate structure based on weight or composition of waste, rather than the size of the container. A study was conducted to measure container weights for non-residential wastes on five weekday collection routes in the City of Kirkland over a 12-month period (KCSWD et al. 2008a). This study determined that businesses with large amounts of food scraps generate garbage that is significantly heavier than the garbage generated by businesses without large amounts of food scraps. In Washington, non-residential garbage rates are based on the size of the garbage container. So generators of heavy materials, such as food scraps, pay less than they might if the rates were based on weight, as they are in some jurisdictions across the country. Because a weight-based rate would likely cost more for generators of large amounts of food scraps, it would provide an incentive for increased participation in organics recycling programs. Another strategy is to offer organics collection to businesses at rates less than garbage. A number of cities in King County do this, thereby increasing diversion and reducing their costs.

Comment [GJ39]: Any update from Kirkland on this?

## C&D COLLECTION AND PROCESSING

C&D includes debris from the construction, remodeling, repair, or demolition of buildings, other structures, and roads. It includes clean wood, painted and treated wood, dimensional lumber, gypsum wallboard, roofing, siding, structural metal, wire, insulation, packaging materials, and concrete, asphalt, and other aggregates. As with recycling, C&D collection and processing is handled primarily by private-sector firms. Debris from new construction sites is fairly easily separated and recycled. At demolition sites, however, while some of the debris can be salvaged, the remaining mixed materials are difficult to separate and recycle.

### **Insert I-4.10**

*Separation of materials with economic value, such as metals, at a construction site can help reduce project costs.*

Separation of recyclable C&D materials from C&D wastes at the job site is generally more cost effective than disposal. Proper separation at the job site also ensures that materials go to higher end uses, such as the manufacture of new recycled-content building materials. C&D materials are typically hauled from a job site by 1) the contractor or the individual working at the job site, 2) an independent C&D hauler permitted to handle C&D for recycling only, or 3) a collection company permitted to haul materials for both recycling and disposal. C&D processing of recyclable materials occurs using either source-separated or commingled methods. Source-separated processing, which occurs particularly on large projects with adequate space, involves sorting specific types of C&D material on the job site (e.g., metals, concrete, and clean wood) and transporting them to a recycling facility(ies). Commingled processing involves placing all recyclable C&D in one container and then transferring the mixed C&D loads to a facility that uses mechanical and manual methods to sort the recyclable materials.

With improvements in the ability of processing facilities to separate materials, the current trend is toward the commingling of recyclable C&D. If C&D and garbage are ~~commingled~~mixed together, however, the recyclables cannot efficiently be extracted for processing. These mixed loads ~~must are~~ therefore ~~be often~~ disposed of in their entirety. At large job sites, demolition debris or construction materials are sometimes loaded into 100-cubic-yard containers and transported by a solid waste-permitted hauler directly to an intermodal facility where they are

loaded onto railcars and sent directly to a landfill for disposal. Again, in these cases, there is no opportunity for the recycling of any materials in these loads.

~~Independent C&D haulers with commercial permits can transport recyclable C&D materials from job sites to either source-separated or commingled C&D processors. These independent haulers cannot, however, transport C&D materials for disposal. Only collection companies permitted by the WUTC to haul solid waste can transport C&D materials for disposal, as well as recycling. While source separated C&D may be collected by haulers with commercial permits, most King County cities require that mixed C&D waste be managed by the franchised hauler(s) unless the mixed C&D contains more than 90% recyclable materials or the jobsite utilizes self-hauling, where the contractor hauls its own waste.~~

At the C&D processing facilities, loads are deemed either appropriate or inappropriate for recycling. For loads deemed appropriate for recycling, the materials are sorted for shipment to market. If deemed inappropriate for recycling (typically due to contamination by garbage or materials that cannot be recycled), the materials are transferred directly to a disposal facility. In some cases, easily separated recyclables may be extracted for recycling before the load is disposed.

The division currently contracts with Waste Management and Republic Services to take C&D for both disposal and recycling. Between them, the two companies operate six contracted facilities in the region that collect C&D (Table 4-2). While initially most of the C&D was collected for disposal, ~~both companies have been increasing their ability to sort and recycle increasingly~~ these materials are being processed for recovery of recyclable materials. The division's current C&D contracts ~~are scheduled to expire in 2014~~ will expire in 2015. Before the expiration date, ~~the division will have~~ evaluated options for ensuring adequate transfer capacity and recycling/reuse opportunities for C&D in the future and the preferred option going forward is to develop agreements with C&D processing and disposal facilities that require readily recyclable materials be removed before residual C&D waste is disposed. ~~Options could include negotiating new contracts for C&D handling, allowing C&D to flow to private-sector facilities without division contracts, and~~ The division is also considering accepting more C&D at new and reconstructed county transfer stations that have increased capacity for processing C&D to remove recyclable materials.

The division is also working with King County cities to develop requirements at the jobsite permitting level that require C&D to be sent only to those facilities that adequately recycle C&D materials and have signed agreements with the division, as discussed above. The City of Shoreline has already implemented these requirements. Additional cities and the King County Department of Environmental Review are in the process of developing similar mandates.

#### **Insert Table 4-2. C&D facilities under contract to the division**

Comment [HB40]: Update

Improving separation of recyclable and non-recyclable materials at the job site ~~would have a positive effect on the~~ improves recycling ~~rates~~ efficiency at C&D facilities. Effective April 2009, a statewide rule took effect that requires job sites to have separate containers for recyclable materials and non-recyclable materials (garbage), wherever C&D recycling is being performed. The intent is to reduce contamination in the container slated for recyclable C&D.

The Current contracts between the county and Waste Management and Republic Services offer monetary incentives to encourage the recycling and diversion of C&D material. In 2011, about 16 percent of what was delivered to these facilities was diverted from disposal. A challenge for these companies is that by contract they are required to accept all loads of C&D brought to their facilities, including loads that contain mixed materials or garbage that cannot economically be separated for recycling.

Comment [HB41]: Update

There are a number of facilities not under contract with the county that also accept C&D for recycling. Because they do not accept all loads of C&D, their recycling rates ~~may approach 100 percent~~ are significantly higher than facilities that accept all types of C&D waste. These facilities range from those that accept only limited materials, such as concrete and asphalt, to those with operations similar to the contracted facilities that accept commingled C&D materials for separation and recycling.

### Management of Residuals from C&D Processing

The processing of C&D produces materials that are reused or remanufactured, as well as residuals. Residuals consist mainly of fine-grained particles that have little market value and are not appropriate for recycling. ~~Although they are not recyclable, residuals may sometimes be put to what is termed beneficial use. Beneficial use, per WAC 173-350, refers to the use of solid waste as an ingredient in a manufacturing process, or as an effective substitute for natural or commercial products, in a manner that does not pose a threat to human health or the environment. The avoidance of processing or disposal costs alone does not constitute beneficial use.~~

~~Currently, residual waste, generated at C&D processing facilities, from projects located C&D processing facilities~~ within the King County service area ~~that cannot be recycled or beneficially used~~ must be disposed at a county-designated C&D waste receiving facility. In King County, the amount of residuals generated during C&D processing can vary from 15 percent to more than 50 percent depending on the amount of non-recyclable materials initially present and the efficiency of the operation. Under state law (WAC 173-345), recyclable materials are defined pursuant to a local solid waste management plan. Materials that are designated as reusable, recyclable, or beneficial use are counted as diversion from landfill disposal and contribute to the county's Zero Waste of Resources goal.

Comment [JN42]: Suggest deleting this section, it doesn't really add to the discussion.

~~Small-diameter processing residuals typically have properties that meet American Society for Testing and Materials Standard 06523-00 (2009) for use as daily cover in a permitted landfill. Two landfills in Washington reportedly use small diameter processing residuals as alternative daily cover.~~

~~The county's current C&D contracts with private haulers recognize use of C&D residuals as alternative daily cover for landfills as beneficial use. Ecology, some solid waste districts in the region, as well as proposed revisions to the Leadership in Energy and Environmental Design (LEED) certification system, designate alternative daily cover as disposal. As recommended in Chapter 3, Waste Prevention and Recycling, the division will continue to work with stakeholders to reach a unified definition of beneficial use throughout the region and the state.~~

The definition of beneficial use may need to change over time, as technological advances and new recycling options may result in new, higher value end uses for some of these materials. When the C&D disposal contracts expire in 2015<sup>4</sup>, the division will reevaluate the designation of alternative daily cover as beneficial use with the intention of aligning its policy with that of Ecology and other local solid waste districts. If Ecology chooses to address this issue in a future revision of the WAC definitions in the interim, those designations will supersede any developed by the county.

**Comment [GJ43]:** Beneficial use will be defined in our new C&D ordinance.

#### Possible additions:

Climate change – affect collection has on climate change and what we (and the haulers) are doing about it

**Comment [HB44]:** Add sidebar that discusses affect collection has on climate change and what we (and the haulers) are doing about it

#### Green Fence

A Chinese law that has been in effect since the 1990s gives Chinese markets the authority to reject shipments of recyclables that include food waste or other problematic contaminants. The law was not regularly enforced until Operation Green Fence was initiated in February 2013. The result has been more stringent export quality standards. In response, processors have taken steps to improve product quality by increasing investment in sorting labor and equipment. For example, one company has added sorters and newspaper and cardboard screeners at all of their MRFs. Multiple processors noted that Chinese investment in enforcing the Green Fence may ebb and flow, but the quality standards that Operation Green Fence introduced are “the new normal.”(Cascadia Consulting Group, 2015)

#### Other?