



**KING COUNTY**

1200 King County Courthouse  
516 Third Avenue  
Seattle, WA 98104

**Signature Report**

**September 28, 2010**

**Motion 13345**

**Proposed No. 2010-0435.1**

**Sponsors Phillips and Hague**

1           A MOTION accepting a report by the transit division  
2           detailing the feasibility of implementing recycling and solar  
3           powered trash compaction at transit passenger facilities  
4           maintained by King County.

5           WHEREAS, the King County department of transportation provides a variety of  
6           public transportation services to the citizens of King County, and

7           WHEREAS, some of these services include activities pertaining to waste  
8           collection at hundreds of transit passenger facility locations throughout the county, and

9           WHEREAS, a proviso in the 2010 Budget Ordinance, Ordinance 16717, requires  
10          the transit division to transmit a report detailing the feasibility of implementing recycling  
11          and solar powered trash compaction at transit passenger facilities maintained by King  
12          County with a motion for council approval, and

13          WHEREAS, the facilities management division was also issued a similar proviso  
14          and both divisions were directed to collaborate and provide a joint report, and

15          WHEREAS, the transit division has collaborated with the facilities management  
16          division and together they have determined that they have uniquely different operations  
17          and waste collection methods, and

18           WHEREAS, the transit division and the facilities management division will be  
19 providing separate reports to address the proviso in order to fully address the unique  
20 features and operations in each division, and

21           WHEREAS, the transit division has determined it is feasible to test both recycling  
22 and solar powered trash compaction at transit facilities;

23           NOW THEREFORE, BE IT MOVED by the Council of King County:

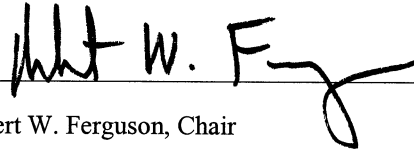
24           The report detailing the feasibility of implementing recycling and solar powered

25 trash compaction at transit passenger facilities maintained by King County, as outlined in  
26 Attachment A to this motion, is hereby accepted.  
27

Motion 13345 was introduced on 8/23/2010 and passed by the Metropolitan King County Council on 9/27/2010, by the following vote:

Yes: 9 - Ms. Drago, Mr. Phillips, Mr. von Reichbauer, Mr. Gossett,  
Ms. Hague, Ms. Patterson, Ms. Lambert, Mr. Ferguson and Mr. Dunn  
No: 0  
Excused: 0

KING COUNTY COUNCIL  
KING COUNTY, WASHINGTON



---

Robert W. Ferguson, Chair

ATTEST:



---

Anne Noris, Clerk of the Council

**Attachments:** A. Recycling and Solar Powered Trash Compaction at Transit Passenger Facilities

13345



**King County**

**Recycling and Solar Powered Trash Compaction  
at Transit Passenger Facilities**

**A Feasibility Report**

Response to a Proviso in King County Ordinance 16717, Section 131, P7

Prepared by the Metro Transit Division, Department of Transportation  
July 2010

## Background

This report responds to the King County Council 2010-11 Transit Budget proviso P7 requesting that the Transit Division evaluate implementing recycling and solar-powered trash compaction at transit passenger facilities. The proviso states:

*“Of this appropriation, \$100,000 shall not be expended or encumbered unless, by August 1, 2010, the transit division has transmitted and the council has accepted by motion a report detailing the feasibility of implementing recycling and solar powered trash compaction at transit passenger facilities maintained by King County. At a minimum, the report shall include:*

- 1. A discussion of current and past recycling and compaction efforts at King County buildings and their effectiveness;*
- 2. A discussion of the number and location of passenger facilities that have waste receptacles and options for a pilot program at a representative cross section of passenger facilities; and*
- 3. A detailed discussion of the potential for public-private partnerships that would make implementation more cost-effective.*

*Furthermore, the report will provide options for implementing recycling and compaction at King County passenger facilities and the executive’s preferred alternative. By another proviso, the facilities management division is to report on implementing recycling and compaction at King County buildings. Therefore, the transit and facilities management divisions are directed to collaborate and provide a joint report.*

*The report and motion required to be submitted by this proviso must be filed in the form of a paper original and an electronic copy with the clerk of the council, who shall retain the original and provide an electronic copy to all councilmembers and to the committee coordinator for the physical environment committee, or its successor.”*

## Trash Collection: Current Practices

Transit’s Power and Facilities Section is responsible for the maintenance of operating bases and passenger facilities, including the repair of equipment, building systems and infrastructure. This includes the collection and disposal of trash and the promotion and coordination of recycling.

## Passenger Facilities

Transit’s passenger facilities are defined as the bus stops, park-and-ride lots, parking garages, transit centers, and the Downtown Seattle Transit Tunnel (DSTT). Maintenance of passenger facilities is not limited to collecting garbage from waste receptacles. Service consists of cleaning shelter glass, power washing and cleaning the shelter area, removing graffiti, general maintenance and performing minor repairs.

These activities are scheduled based on ridership and maintenance requirements. For example, shelters in the heaviest ridership locations in downtown Seattle are serviced with nightly garbage pick-up. Lower ridership locations are scheduled commensurate with usage patterns, unless complaints are received for special conditions such as vandalism. These maintenance needs may drive the frequency a shelter site is visited, not the garbage volume. In most instances, garbage is picked up as part of other scheduled work activities at the site.

Metro waste receptacles are generally placed at locations where customers wait for buses, except for bus zones that do not have shelters. In some of our larger bus zones and facilities, there may be more than one waste receptacle. It should be noted that jurisdictions or adjacent businesses may also have their own receptacles near transit facilities. In dense urban areas (such as downtown Seattle) there may be a combination of city and Metro trash cans in the same general area.

Number of Metro waste receptacles

DSTT stations	16
<hr style="border-top: 1px dashed black;"/>	
P&R Lots and garages	88
<hr style="border-top: 1px dashed black;"/>	
Transit Centers and Bus Shelters	1,406
<hr style="border-top: 1px dashed black;"/>	

Although Transit currently has approximately 1,500 trash receptacles throughout the system, receptacles vary in size and shape to accommodate trash volume, available space and maintenance schedules. Approximately 1/3 of the receptacles are small 10-gallon cans mounted on posts placed at the lowest volume bus shelter locations. Garbage in these cans is removed at the same time cleaning, pressure washing, or other scheduled maintenance is performed at the shelter, usually weekly. There are 600 to 700 full-size receptacles placed at other passenger facilities which are serviced two to three times per week. These low-to-mid volume locations currently present few trash related issues or complaints. Between 300 to 400 additional locations are serviced more frequently due to higher volumes.

Trash collection from passenger facilities is generally conducted by one of two methods:

- Metro’s own compacting trash collection vehicles are used in the highest volume corridors. Trash goes directly into the compactor.
- At lower volume sites, trash is collected by shelter cleaning crews and then taken to a Metro operating base trash compactor or dumpster prior to disposal.

## Operating Facilities

Each operating facility has a bulk trash receptacle serviced by a disposal vendor. Central Base has a stationary compacting unit because it serves as the central point of unloading garbage for many of the bus shelter cleaners. The compacting unit reduces drive time by cutting workers' headway to unloading points further north or south and increases capacity at the site. A typical bulk trash receptacle is emptied three times per week; this compacting unit is emptied once a week, saving vendor costs. Traditional dumpsters are used at the remaining transit bases.

## Recycling

There is no on-going recycling program at passenger facilities. In the past, Transit has conducted trials to collect recyclables at passenger locations. For example, recycling receptacles were placed in several places at Westlake Station in the DSTT for several months in 1999-2000. The result was not very successful – there were as many recyclables deposited in the garbage cans as there were in the recycling bins. Trials at street side bus zones were similarly unsuccessful, with much of the collected recyclables contaminated with food, pet waste and household garbage.

The majority of recycling and reuse programs are oriented for employees who work at transit operating and maintenance facilities. There are three main categories of recycling presently in place (specialized materials are also recycled; these are listed in Appendix A):

Common Recyclables: Offices, work areas, kitchens, lunchrooms and store rooms etc. have recycling receptacles. Building custodians collect and unload recyclables for pick up by vendors. Most are collected at no cost to Transit.

Scrap metals and wood: Vehicle (bus) and facilities maintenance sites generate much of the metal and wood "wastes" that are recycled. Industrial-sized bins and receptacles are provided at these facilities where pick up is by vendors.

Co-mingled recyclables: This is the trash that is removed from buses during cleaning. Consisting mostly of loose bits of paper and other debris (after cleaners remove heavier recyclable items), this waste used to be disposed as garbage. Recent acceptance of this waste as recyclable is due to the success of the City of Seattle's residential recycling program where some co-mingled materials are now allowed.

In addition, re-usable items such as furniture and equipment are "surplused" and miscellaneous building materials and parts are offered to contracted non-profits' reuse programs (e.g. The RE\*Store) or to the County's Industrial Materials Exchange. A full

list of materials recycled and made available for reuse by Transit Power and Facilities is in Appendix A.

Transit's recycling program at operating facilities (bases, maintenance and other support facilities) has resulted in significant reductions in the volume of waste deposited at landfills. In 2009, 700 tons of transit related material was recycled.

#### Proposed Pilot Program: Solar Powered Trash Compaction

A one-year demonstration of solar trash compaction receptacles at two bus shelter locations is proposed. The purpose of the demonstration of solar trash compaction receptacles is to determine if the ability to compact trash at the bus stop level can reduce the cost of trash pickup by reducing the frequency of trash pickups at the site. Secondary benefits could be a reduction in litter at bus zones from overflowing trash cans and reduced carbon emissions from trash collection vehicles.

To save maintenance costs, the solar powered trash cans would need to be located along one of the busiest transit corridors where trash collection at bus shelters occurs more frequently than the shelter cleanings. By reducing the frequency of trash pickup, visits to the shelter sites could be reduced, resulting in cost savings. The candidate corridors include downtown Seattle, Pacific Highway South, Aurora Avenue North and selected arterial corridors in Seattle. The City of Seattle has solar compacting receptacles along Third Avenue. While the City still continues to service the receptacles on a daily basis, the City experienced fewer complaints about over-flowing trash.

The recommended location for the demonstration is at shelters on the new "Rapid Ride A Line" on Pacific Highway South between Tukwila and Federal Way. Trash on this corridor is currently collected three times per week. Maintenance crews in the corridor will be able to monitor the solar powered trash cans to determine when capacity is reached and compare frequency of compacted trash pickup to traditional trash receptacles along the corridor.

Only one product powered by solar energy is available for public use – see the product description and photo of "BigBelly" that follows on the next page. The units are battery-operated and require battery replacement approximately every five years. Its size is comparable to a standard large, square waste receptacle typically found in public areas. The cost is approximately \$4,600 per unit.

*"The BigBelly® Solar Compactor is a patented compacting trash receptacle that is completely self-powered. Instead of requiring a grid connection, BigBelly uses solar power for 100% of its energy needs. The unit takes up as much space as the "footprint" of an ordinary receptacle—but its capacity is five times greater. Increased capacity reduces collection trips and can cut fuel use and greenhouse gas emissions by 80%. BigBelly also provides cost efficiencies from labor savings, fuel cost and maintenance savings, as well as environmental benefits from reduced emissions of greenhouse*



*gases and other pollutants. Safe, easy to use, and designed to keep out pests, the BigBelly has already proven its worth in urban streets, parks, colleges, arenas—and in all weather conditions.”*



This product offers some advantages over conventional receptacles. Besides the compaction feature, the units have totally enclosed collection bins which prevent birds, rodents and other scavengers from entering/reaching into the receptacles and scattering trash on the ground. The unit’s enclosed design keeps the collected trash contained and dry during inclement weather. The hopper size will restrict large deposits that usually come from illegal dumping of household garbage.

On the other hand, the trash compaction units are not as ergonomically friendly as other regular receptacles presently in use. The collection bin is low to the ground and requires more bending or squatting by staff when removing the trash. In addition, the current average weight of collected trash is around 10-20 pounds compared with a potential expected weight of 40 pounds or more for compacted trash. The repetitive nature of collecting, lifting and handling trash at multiple locations may contribute to an increase in on-the-job injuries.

#### Pilot Program Evaluation Criteria

- frequency of collection required to keep trash within capacity of the receptacle
- complaints about litter on ground
- cost to purchase, maintain and replace receptacles
- operating and capital costs, and carbon emissions for trash pickup
- workplace injuries

#### Proposed Pilot Program: Recycling at Passenger Facilities

A six-month demonstration of recycling collection at passenger facilities is proposed. The purpose of the demonstration is to determine how to best collect recyclables, how many recyclables can be reclaimed, the types of facilities where it can be done most successfully, and the cost of such a program.

Recycling containers will be established at a half dozen high use locations including at least one DSTT station, a transit center and a major park-and-ride lot. Except for the DSTT location where containers would be indoors, containers for the other facilities will likely need to be outdoor or weather-proof.

Whether these containers can accept mixed (co-mingled) materials or be segregated will be evaluated as the demonstration is finalized. There are pros and cons to either recycling method. Co-mingled containers in which all recyclables are collected might be easiest for the public to use and only one container per location would be required. However, the negative aspects of the one container collection include the potential for contamination by garbage and other non-recyclable materials and co-mingled recyclables have disposal fees. For segregated recycling, a three to four receptacle set is needed so that recyclables are “pre-sorted” prior to pick-up. The downside of the multi-container collection is that recyclables may be placed in the wrong bin. Segregated recyclables are easier to dispose and typically no costs are involved.

#### Pilot Program Evaluation Criteria

- volume of recyclables
- cost to purchase, maintain and replace receptacles
- cost to collect and/or sort contents
- availability of vendor support for pickup
- volume of non-recyclable materials collected

#### Public-Private Partnership

Compacting Trash Receptacles: Investigation of pricing options with the vendor suggests a lease to own option may be available for use of the receptacles for the limited time period of the demonstration. This option, and its potential benefits, will be examined in detail to determine if leasing during the demonstration will be more cost effective than purchase.

Recycling: The present market value for typical recycled goods such as paper, plastics, bottles and cans is very low. Transit has yet to identify a private vendor willing to supply receptacles and pick-up recyclables in exchange for the value of the materials collected. It may be possible to get sorted recyclables picked up for little or no cost, but the likelihood of co-mingled recyclables removed at no cost is very low.

## Appendix A

### 2009 Recycling and Reuse Amounts Collected at Transit Facilities

Item Name	Quantity	Unit of Measure	Notes
Acrylic Sheets	3.33	tons	Re-use
Acrylic Sheets	6.00	tons	Recycled
Appliances	7	each	Recycled
Asst. Batteries	1.91	tons	Re-use
Asst. Paper	142.82	tons	Recycled
Bus Tires	168.18	tons	Re-capped/Re-tread
Bus Tires	178.44	tons	Used for hog fuel
Fluorescent Lamps	54,497	feet	Recycled
Light Duty Tires	13.97	tons	Used for hog fuel
Misc. Electric Scrap	1,315	pounds	Recycled
Misc. Furniture	2.00	tons	Re-use
Misc. Lamps	2,567	each	Recycled
Misc. Plastics	1.28	tons	Recycled
Pallets	14.67	tons	Re-use
Pallets	15.95	tons	Recycled into compost or hog fuel
Polyurethane Foam	1.88	tons	Recycled
Scrap Buses	503.16	tons	Recycled
Scrap Metal	472.81	tons	Recycled
Shelter Glass	12.32	tons	Re-use
TVs & Monitors	35	each	Recycled
Waste Oil	103,456	gallons	Sent out to be re-refined
Yard Waste	17.88	tons	Compost