King County

1200 King County Courthouse
516 Third Avenue
Seattle, WA 98104

KING COUNTY

Signature Report

October 6, 2009

Motion 13086

Proposed No. 2009-0465.2 **Sponsors** Phillips

A MOTION accepting a report by the parks and recreation division in the department of natural resources and parks on the feasibility of implementing recycling and solar powered trash compaction in the King County parks system, as required in the 2009 Budget Ordinance, Ordinance 16312, Section 88, Proviso P4.

WHEREAS, King County's parks system consists of the regional trail system, natural area parks and active parks, and

WHEREAS, current waste collection represents one aspect of the maintenance staff activities and emptying trash cans is a relatively small aspect of the division's operation, and

WHEREAS, in the King County parks system, maintenance routines have long been tracked and streamlined and the emptying of waste receptacles is one task among many that the maintenance staff perform, and

WHEREAS, the division performed a thorough evaluation of the potential for using a solar powered compaction system in the regional trail system, natural area parks and active park sites, and

WHEREAS, King County seeks to maximize environmental, economic and efficiency benefits when emptying waste receptacles in the parks system, and

WHEREAS, the division explored partnership and advertising opportunities that would make solar compaction implementation cost-effective, and

WHEREAS, the division has successfully developed and implemented public-private partnerships through the community partnerships and grants program and worked with corporate partners to bring in revenue, and

WHEREAS, the division developed a successful public-private volunteer program to educate and increase recycling at the concert series at Marymoor park without incurring additional maintenance or capital costs, and

WHEREAS, capital funds to purchase new compaction units would have to come from reducing or eliminating projects, and

WHEREAS, a proviso in the 2009 adopted budget requires acceptance by motion of a report addressing the feasibility of implementing recycling and solar powered trash compaction in King County parks;

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

The report describing the status addressing the feasibility of implementing recycling and solar powered trash compaction in King County parks, is hereby accepted.

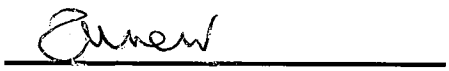
Motion 13086 was introduced on 8/17/2009 and passed by the Metropolitan King County Council on 10/5/2009, by the following vote:

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

KING COUNTY COUNCIL
KING COUNTY, WASHINGTON

Dow Constantine, Chair

ATTEST:



Anne Noris, Clerk of the Council

Attachments A. Review the feasibility of implementing recycling and solar powered trash compaction in the King County Parks and Recreation Division system

Review the feasibility of implementing recycling and solar powered trash compaction in the King County Parks and Recreation Division system.

Ordinance 16312 included a proviso that required the Parks and Recreation Division to submit a report to the King County Council by August 1, 2009, as follows:

> "Of this appropriation, $100,000 shall not be expended or encumbered unless, by August 1, 2009, department of natural resources and parks has transmitted and the council has accepted by motion a report detailing the feasibility of implementing recycling and solar powered trash compaction in King County parks. At a minimum, the report shall include:
>
> 1. a discussion of current and past recycling and compaction efforts at King County and their effectiveness;
> 2. a discussion of the number and location of recycling and compaction receptacles that would be needed; 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 in King County parks and the executive's preferred alternative."

Overview

The Parks and Recreation Division appreciated the opportunity to further review the potential of integrating solar powered recycling and compaction receptacles into its system to facilitate waste collection. We focused this case study on Marymoor Park, the system's largest active park that also has the greatest number of waste receptacles – nearly one-quarter of the total – in the system. Active parks have the most waste collection needs and this location would have the greatest opportunity to benefit from cost savings of compaction units in our park system.

The crews in our parks and trails are multi-tasking, with waste collection representing one aspect of their maintenance activities. As a result, emptying cans is a relatively small aspect of the division's operations. For agencies that make trips specifically to pick up waste or that need to empty cans frequently, a solar compaction system may generate significant savings. However, the Parks and Recreation Division and its facilities fit a different profile. Emptying waste receptacles is one task among many that our maintenance staff perform on any trip, and the majority of the receptacles at Marymoor Park, for instance, require visits just once a week. More frequent visits are limited to special circumstances, such as an event or holiday weekend.

Marymoor Park

Annual number of times to empty each waste receptacle	74
Number of waste receptacles	158
Time to empty each receptacle	6 minutes

Capital Costs

Solar compaction cost estimate per unit*	$4,035 - $5,650
Current receptacle cost per unit	$80

	Plastic Cans	**BigBelly Solar Base Unit**	**BigBelly Solar with Recycling and Wireless**
	Current System	*Assumes using system could cut visits by half*	
Capital cost per receptacle	$ 80	$4,035	$5,650
Annual average visits to can	74	37	37
Annualized capital cost per can (10 years)	$ 8	$ 404	$ 565
Annual maintenance cost to empty can	$ 288	$ 144	$ 144
Total annual cost per year	**$ 296**	**$ 548**	**$ 709**
Total ten year cost difference per can		**$2520 increase**	**$4130 increase**

The capital cost per unit for a solar compaction system, assuming a ten-year life and no mechanical repairs, is $404 - $565 per year. For the division, the need for emptying receptacles could drop by half, yet using a solar compaction system could still increase overall costs by eight-five to one hundred forty percent (85-140%) for each receptacle. The division would need to eliminate 100 visits to a can every year to break even on each base unit. However, this is more than the average annual visits to each can at Marymoor.

1. Current Compaction and Recycling Efforts

For nearly 30 years, the Parks and Recreation Division has used compaction to reduce maintenance costs. Since the 1980's, waste throughout the system has been picked up by a compacting garbage truck. This has proven quite effective, as fewer trips need to be made to the transfer stations, saving staff time, fuel and expense.

The division has also used compaction receptacles at two major sites, Marymoor Park and Tolt-Macdonald Park. The division purchased in-ground compaction models that rely on gravity to compact the waste. These models have been less effective than the

* Cost per unit based on BigBelly Solar price quotation to King County Transit for 25 BigBelly Solar Compactor units. The base unit includes the solar compactor unit, shipping and sales tax. The full model also includes a recycling component, wireless communication capabilities, two-unit kiosk, and two years of the monthly communication package, installation and taxes.

division hoped. Compacted trash is heavier to move, so these receptacles require special equipment to empty the containers, and this equipment has needed regular repair. These receptacles also require more expensive bags than standard waste bags. The compaction units have been particularly problematic at Tolt-Macdonald Park, where they came free from the ground due to flooding. In addition, the opening to the receptacles was too small for campers' trash, so trash bags were regularly left next to the receptacle and crews had to pick them up separately. The compaction units remain at Marymoor Park, while they have been removed from Tolt-Macdonald Park.

In addition to compaction, the division has made recycling efforts at Marymoor Park. The division previously had recycling bins at Marymoor Park, with separate receptacles for waste, glass and other recyclables. However, the public regularly put trash into all of the receptacles, rendering the recyclables unusable, so the recycling containers were removed. Currently, there is a volunteer recycling program at Marymoor Park for the concert series, where volunteers help collect recyclable materials as well as teach the public about recycling. Through this program, the division has increased recycling without incurring additional maintenance or capital costs, while helping park users learn more about recycling and its benefits.

2. Receptacles

The parks system consists of the regional trail system, natural area parks and active parks. While metal cans were previously used, these were often vandalized, so the division switched to a standard $80 plastic model in 1996, which are used throughout the system, and have over a 10 year usable life. The time to service a waste receptacle is roughly six (6) minutes, which requires removing the lid, removing the bag, replacing the bag, replacing the lid, and putting the bag in the truck.

Trails

In 2008, the division analyzed the potential for using a solar powered compaction system along the regional trail system. For maximum efficiency, crews need to multi-task as they maintain the trails, and as a result, the waste collection is one of many tasks done along with general trail maintenance and is a marginal cost. As found in the 2008 analysis, the savings were limited to the marginal cost of emptying waste receptacles and the return on investment would not be recovered until beyond the seventh (7^{th}) year of operation. As a result, the return on investment was prohibitively high for these receptacles to be used on the trail system.

Natural Area Passive Parks

In addition to trails, the King County parks system consists of natural area passive parks and active parks. The majority of the parks in the system fall in the former category. At these parks, the division generally has a "pack it in, pack it out" policy, much like the state parks policy for natural areas. At many of these locations, the division never had waste receptacles, and receptacles have been removed from the other natural area parks over time. This was due to prolonged experience with the misuse of receptacles at the natural area parks. Typically, these receptacles were not filled by park users' garbage, but rather home garbage and illicit material was filling these cans. The division

discovered that by removing the cans at these sites, the problem of the illegal dumping of home garbage generally went away. With the "pack it in, pack it out" policy, the division does not have to combat vandalism to cans. Adding any type of waste receptacles to the natural area parks would create a new cost for the division.

Active Parks

The final category in the division's inventory is active parks, and their number has decreased over the last eight (8) years. Since the 2002 county budget crisis, the majority of the county's active parks were transferred to local jurisdictions. Most of the remaining active parks are located in the Urban Growth Area (UGA). Funding for the maintenance of these parks is through the General Fund and is anticipated to sunset by 2011, at which time these parks will need to transfer to local jurisdictions or be mothballed. This will leave the division with only a few large active facilities such as Marymoor Park and the King County Aquatic Center, as well as some local rural parks such as the Preston Athletic Fields.

At the division's remaining active parks, there is regular waste collection. However, collection is one of many jobs at any site for the multi-tasking maintenance crews. For instance, restrooms need to be visited daily for health and safety reasons. Crews also have to regularly visit ballfields and picnic shelters, to groom fields, inspect for safety, and pick up litter. Litter takes the majority (eighty-five to ninety percent (85-90%)) of the crews' time spent handling waste, with significant litter underneath bleachers, around picnic shelters, in parking lots, etc. Even if there were no waste receptacles, these other jobs would need to be done by the same crews. As a result, emptying waste receptacles is a marginal cost added to the necessary travel and clean up time to meet health and safety standards at these facilities.

Marymoor Park is the division's flagship active park and its most actively used park. At this facility, there is a significant number of waste receptacles. These have been used as efficiently as possible in order to decrease the amount of time spent to empty them. For instance, when there are large events such as tournaments or the concert series, the division will move the park's large dumpsters to the site to eliminate the need for regular emptying of small receptacles. As a result, most waste receptacles only need to be emptied once a week in our most heavily used park.

3. Public-private partnerships

The division has successfully developed public-private partnerships through the Community Partnerships and Grants (CPG) program and worked with corporate partners such as Starbucks to sponsor the White Center Heights Ultimate Park Makeover and GroupHealth for the naming rights of the Velodrome at Marymoor Park. These partnerships have helped the division bring in much needed revenue to meet the goal of a five percent (5%) annual increase in business revenues.

As mentioned above, the division also has a volunteer recycling program, where volunteers help collect recyclables and teach the public about diverting recyclable materials from the waste stream during the concert series at Marymoor Park. Through

this volunteer program, the division has developed a successful public-private partnership to increase recycling at the concert series at Marymoor without incurring additional maintenance or capital costs.

The division looked at the possibility of selling advertising space on recycling and waste receptacles to partnering sponsors, as some jurisdictions have been able to do. However, corporate marketing budgets have been cut dramatically during the last couple of years. This has already impacted the division's ability to generate advertising revenue, including sponsorship for events and advertising on the trail kiosks. As a result, the potential for raising revenue through advertising on receptacles appears to be limited, and is too uncertain to count on to contribute significantly to the cost of the units. For agencies lacking places to show public service announcements, this could be a good option.

4. Parks' Financial Considerations

A final consideration is the division's financial situation, which is affected by the economy. The Real Estate Excise Tax (REET) is our primary funding for capital purchases for the system. REET is down seventy percent (70%) from 2007, as it has been seriously affected by the drop in housing transactions, leaving little funding for our highest priority projects such as major maintenance. As a result, capital funds to purchase new compaction units would come from reducing or eliminating other planned projects.

With this financial problem, it would be hard to justify major capital purchases or long-term leases that did not generate a significant amount of savings for the division.

Summary

A solar trash compaction and recycling system may be highly effective in a system where trash collection is the primary task for maintenance trips or staff. Savings in this type of system could be found by eliminating the number of trips needed to collect waste, particularly if trips are made solely to collect waste. In the King County parks system, however, maintenance routines have long been tracked and streamlined, and the emptying of waste receptacles is one task among many that our maintenance staff perform on any trip.

Some efficiency could be found by using a solar compaction trash system at a site like Marymoor Park, but the maintenance savings would not make up for the cost of purchasing or leasing the unit and the remaining maintenance costs. A solar compaction system also would incur other costs, including repair or replacement costs for vandalism or mechanical breakdown, the staff time to monitor on the computer whether or not the receptacles need to be emptied, and special runs to empty receptacles if a trip is not already scheduled in the vicinity. In addition, there would be little reduction of the division's carbon footprint, as our multi-tasking maintenance crews would not be saving driving time or be able to use different equipment if emptying receptacles less frequently.

Due to the nature of the county's park inventory and the need for multi-tasking maintenance in our system, the division's current maintenance and capital costs for waste are minimal. Crews need to visit the restrooms, ballfields and picnic shelters at our parks and trails on a regular basis to meet health and safety standards, regardless of the need to empty waste receptacles. In addition, our "pack it in, pack it out" policy eliminates the majority of regular waste collection costs for the natural area parks. Where the division does have regular collections, such as at Marymoor Park, the maintenance staff empty the trash receptacles an average of 74 times annually, as opposed to the 100 visits annually that would need to be eliminated for the units to pay for themselves. For jurisdictions that make trips solely for waste collection, even a break-even proposition could be worthwhile, as it would allow the agency to focus the same staff time on different projects. However, the King County parks system does not fit this model.

The division worked closely with the BigBelly Solar Company to look at the needs of the system and our business practices. The use of solar powered trash compaction has many benefits and this will continue to be an option that is reviewed for applicability and financial feasibility in future parks and trails projects. The division will also continue to evaluate the most efficient way to organize work to take advantage of potential technological efficiencies. Likewise, the division understands that there are newer trash compaction models being developed for larger units (i.e. 30-yard dumpsters), which might work well for some parks in King County. The division looks forward to learning more about these newer models as they are developed, as they might save trips to collect and deliver waste to transfer stations and further improve our efficiency and carbon footprint.