Street Sweeping

Focus Area: **Environment & Public Health**
Strategic Objective: **Environmental & Health mandates**
Owner: **Shelly Basketfield**

Summary of proposed action

Expand the existing street sweeping program to increase the sweeping frequency, extend the sweeping season, and add a route. This increases the annual amount of pollutants removed by 40 percent (more than 400 tons from the streets and 40 tons from the City's drainage system) and contributes importantly to the water quality of our urban streams, Lake Washington, and Puget Sound.[1]

Description of the problem this action solves

Streets constitute more than 16% of Seattle's surface area and they are the source of more than 40% of the total stormwater pollutant load. Street sweeping is a very cost-effective, flexible stormwater pollution control practice that removes pollutants from streets, keeping it out of storm drains where it would be carried untreated into creeks, lakes, the Duwamish River, and Puget Sound. Once in the aquatic sediments, contaminants present long-term, persistent risks to aquatic and human health.

The expansion of the existing street sweeping program cost-effectively increases the annual collection of street-borne pollution from about 100 tons to about 140 tons (~230 dump truck loads). Using state-of-the-art regenerative air technology, sweeping does a good job to remove the very fine (less than one sixth the diameter of a hair) particulates that, pound for pound, carry more pollutants than the larger particles. Collected contaminants of consequence include:

- Metals from automobile wear (copper from brake pads, zinc from tires, nickel and chromium from engines)
- Organic compounds from automotive exhaust (poly-aromatic hydrocarbons (PAHs), which are cancer-causing
- Tree detritus (leaves and needles) that stimulates algae growth and depletes oxygen in water (harming fish, and other aquatic life).

More detailed description of the proposed action

Street Sweeping is a collaboration between SPU and Seattle Department of Transportation (SDOT); SPU directs and pays for the sweeping routes that discharge water directly to "receiving waters," while SDOT provides the sweeping services and funds the routes that drain to a sewage treatment plant.

Expanding the existing street sweeping program in 2016 would increase the swept distance by 10,700 curb-miles per year, as depicted in the following table. The primary change is to increase the number of routes swept each week, from 4 to 21.

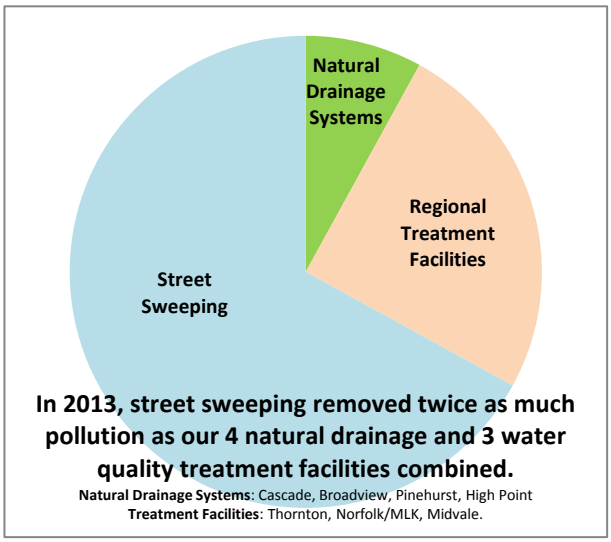
	Schedule			**Outcomes** (Storm Drain related, only. Not SDOT Sewer)		**Efficiency**
	Sweeping Season (weeks)	**Number Routes**[2]	**Number of Weekly Routes**	**Swept Distance** (curb-miles/year)	**Pollutants Removed** (tons/year)	**Unit Cost** ($/lb of pollutant per year)
Current program	**40**	**24**	**4**	**10,000**	**100**	**5**
Proposed Program	**46 to 48**	**25**	**21**	**20,700**	**140**	**7**

[1] This program expansion will be submitted to the Washington Department of Ecology and EPA for consideration as part of the Integrated Plan being developed to comply with the CSO Consent Decree. The proposed expansion will be a regulatory requirement if the Integrated Plan is approved.
[2] A typical route is approximately 30 lane miles long and covers. About 75% of a typical route discharges to storm drains; 25% runs off to the combined sewer system.

Street Sweeping

Benefits of the proposed action

Street sweeping is a very effective means of removing pollutants before they reach water and aquatic sediments. Since 2011, more than 27,000 curb-miles of pavement have been swept, removing 3,500 tons of street solids at a life-cycle cost of about $5/pound of pollutants removed per year, substantially out-performing conventional stormwater treatment.



This proposal removes an additional 40 tons of pollutants per year at a cost of $11/pound of pollutant removed per year. To reduce an equivalent load with a water quality treatment facility, a capital budget between $10 and $20 million would be needed, and cost per pound of pollutant removed would be between $15 to $25. Plus, with street sweeping, we can start the cleaning immediately, and not wait to site, permit, and build a facility.

Street sweeping also provides multiple city-wide benefits (clean water, clean streets, and clean air). Extending the sweeping season to include fall leaf drop season also reduces flooding related to leaf-blocked drainage inlets.

Implementation plan

The program expansion will commence in 2016. Milestones include:

- **2014** – Develop new routes that optimize sweeping time, travel, and dump times as well as meet pollution removal objectives.
- **2015** – SDOT tests and adjusts routes, if needed. Buy new sweeper, if needed. Hire 2.5 FTE operators.
- **2016** – Begin expanded schedule route sweeping.

Budget and FTE Changes (in $000s)[3]

Fund: Drainage & Wastewater

		2015	2016	2017	2018	2019	2020	Total
O&M Labor & Non-labor	Sweeping (SDOT)	0	770	770	770	770	770	**$3,850**
O&M Non-labor	Monitoring (SPU)	$0	$0	$47	$47	$47	$0	**$141**
O&M Subtotal		**$0**	**$770**	**$817**	**$817**	**$817**	**$770**	**$3,991**
CIP	New Sweeper	$345						**$345**
Total O&M and CIP		**$345**	**$770**	**$817**	**$817**	**$817**	**$770**	**$4,336**
FTE - SDOT			2.5	2.5	2.5	2.5	2.5	

The O&M Labor & Non-Labor for SDOT shows as Non-Labor in SPU's budget.

Plan for evaluating success or progress

Program metrics include pollutant load reductions and program cost-effectiveness, from an operating cost per curb-mile basis and a life-cycle per mass of pollutant removed basis. The following information will be collected:

- Miles swept from GPS derived distance and time sweeping on the route, on the storm drain routes, and traveling to and from the route.
- Load removed from onboard scale readings for each route and truck scale readings for the wet load hauled from the temporary stockpiles to the disposal facility.
- Sample measurements from the temporary stockpiles which indicate the level of contaminants in the sweepings.

[3] The budget estimate and FTE changes are for the portion of the routes that drain to receiving waters. SDOT will fund the portion of the routes draining to the sewage treatment plant (~25% of the total sweeping effort or ~$250,000) using General Funds it will request in the 2015 budget submittal.