

## Summary Fact Sheet

**Category:** 2.0 Filtering Technologies

**Practice:** 2.5 Street Sweeping

**General Description:** Street sweeping uses mechanical pavement cleaning practices to minimize pollutant transport to receiving water bodies. Sediment, debris, and gross particulate matter are the targeted pollutants, but removal of other pollutants can be accomplished as well. Street sweeping may also prevent pipes and outlet structures in stormwater detention facilities from becoming clogged with debris and trash. Different designs are available with typical sweepers categorized as (1) mechanical broom sweepers; (2) vacuum-assisted wet sweepers; and (3) dry vacuum sweepers. The effectiveness of street sweeping is very dependent upon when it is done and the number of dry days between storm events.

### Water Quantity Controls

Street sweeping has no effect on the runoff volume or peak discharge rate.

### Water Quality Controls

The effect of street sweeping on water quality depends upon the device's efficiency at debris and particulate capture. A large benefit of street sweeping is that pollutants are captured before they are transported and become soluble in the stormwater. Removal of soluble pollutants in downstream BMPs may be more difficult and costly. Mechanical broom and vacuum-assisted wet sweepers are estimated to reduce nonpoint pollution 5 to 30% and nutrient content up to 15%. Dry vacuum sweepers, being a newer design, have higher removal efficiencies with estimates ranging from 35 to 80% for nonpoint pollution and 15 to 40% for nutrient content.

**Location:** It is estimated that 90% of street contaminants will accumulate within 12 inches of the curb. Street sweeping typically occurs in urban areas along roadways with curbs and gutters. Sweeping may also be practiced in parking lots and other impervious areas expected to accumulate particulates and debris.

**Design Construction and Materials:** Sweeper design influences purchase price and operation and maintenance costs. A mechanical sweeper will typically cost \$75,000 dollars and vacuum assisted models will be approximately \$150,000. High end units may cost up to \$180,000.

**Cost:** The cost for a street sweeper to treat ½ impervious acre is comprised of both the purchase price and annualized costs. These cost calculations were based upon sweeping the perimeter of a ½ acre impervious lot once a week. A street sweeper is expected to have a lifespan of eight (8) years, but the replacement costs have not been annualized because of the small drainage area used for cost comparisons.

Item	Required Cost per Year (2005 Dollars)												
	0	1	2	3	4	5	6	7	8	9	10	...	25
Purchase Price <sup>1</sup>	125,000								125,000				
Operation and Maintenance		100	100	100	100	100	100	100	100	100	100		100
<b>Total Cost</b>	<b>125,000</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>		<b>100</b>
Annualized Cost <sup>2</sup>	\$100 / year												

<sup>1</sup> The purchase price should be allocated across the entire jurisdiction to be swept and not only the ½ acre lot.

<sup>2</sup> Annualized cost does not include sweeper replacement cost.

**Maintenance:** The life expectancy and operation and maintenance costs of a sweeping unit are dependent upon type and sweeping frequency. Mechanical sweepers have a typical life expectancy of 5 years and an O&M cost of approximately \$30 per curb-mile. Vacuum-type sweepers have a life expectancy of 8 years and an O&M cost of approximately \$15 per curb-mile. Operator training expenses should also be included with these costs.

**Performance and Inspection:** The success and performance of a street sweeping program is dependent upon pollutant capture and removal. The street sweeper should be inspected and maintained according to manufacturer recommendations to ensure optimum performance and maximum pollutant capture.



**Street sweeper**

Source: Tymco PERMISSION PENDING

**Potential LEED Credits:**

Primary: N/A

Other: Innovation & Design Process (1-4 Points)

**Links to Additional Information:**

Fairfax County PFM:

<http://www.co.fairfax.va.us/dpwes/publications/pfm/6.htm>

Northern Virginia BMP Handbook:  
<http://www.novaregion.org/pdf/NVBMP-Handbook.pdf>

US EPA Office of Water  
<http://www.epa.gov/owm/mtb/pollutna.pdf>