

Street Sweeping

Description

Street sweeping involves the use of specialized equipment to remove litter, loose gravel, soil, pet waste, vehicle debris and pollutants, dust, de-icing chemicals, and industrial debris from road surfaces. Street sweeping equipment can consist of a truck or truck-like vehicle equipped with multiple brushes, pick-up deflector, holding bin, water sprayer, vacuum nozzle and filter, or a combination of some or all of these features.

Pollutants Controlled and Impacts

When done regularly, street sweeping can remove 50-90% of street pollutants that potentially can enter surface water through storm sewers. Street sweepers will also make road surfaces less slippery in light rains, improve aesthetics by removing litter, and control pollutants which can be captured by the equipment.

Application

Land Use

Transportation, urban

Soil/Topography/Climate

Street sweeping is not effective on snow covered roads.

When to Apply

Street sweeping is typically done in the early morning hours when traffic is light. It is sometimes necessary to control parking by placing signs which limit the hours or the side of the street in which parking is allowed.

Where to Apply

Street sweeping is applicable on urban streets with curb and gutter, or paved drainageways.

Relationship With Other BMPs

Sweeping is recommended at least four times per year on all Porous Asphalt Pavement. Street sweeping in some areas may decrease the frequency in which Catch Basins need to be cleaned.

Specifications

General Considerations:

1. Approximately 90% of the contaminants will accumulate within 12 inches of the curb, therefore, only one sweep is generally necessary to remove contaminants.
2. When replacing gutters or constructing new ones in urban areas, consider installing broader concrete gutters to increase street cleaning efficiency.

3. Damaged pavement is not possible to clean effectively and should be resurfaced in areas where street cleaning is done.
4. Use vacuum sweepers on dry pavement only.

Frequency of Sweeping:

The frequency in which street sweeping should be done is very controversial, and the schools of thought range from "not at all" to "every other day." Some studies have shown that street sweeping may have a negative effect by breaking down aggregated particles (clumps of particles) into fine particles which can be carried more easily by runoff. We feel that the goal of street sweeping should be to keep the larger-sized pollutants from entering storm sewers.

We recommend street sweeping:

- after heavy rain storms in which sediment is present on the streets; and
- adjacent to construction sites where sediment has left the site and entered the street; and
- at least once during the fall to collect leaves and keep them out of the sewer system; and
- at least once during the spring to collect garbage and coarse sediment left behind during snow melt.

The effectiveness of street sweeping appears to be primarily dependent upon the frequency of sweeping and the interval between storms. Additional considerations are operator skill and the number of cars parked at the curb. Other factors in order of importance are: total mass of the area to be swept and its relation to loadings on other areas not accessible to sweepers; the efficiency of sweepers compared to the storm runoff of the pollutant of interest; and local storm characteristics.

Types of Sweepers:

Street sweeping effectiveness is a function of sweeping frequency, number of passes per sweeping, equipment speed and pavement conditions. Below are two types of street sweepers. Keep in mind that street sweeping equipment is manufactured by more than one company and each company competes for design efficiency.

Mechanical broom street sweepers are effective in removing larger particles, but are not effective in removing fine, pollutant-laden dust and dirt (smaller than 400 microns). These small particles contain the majority of pollutants found on the streets (i.e. oxygen demanding substances, nutrients, metals, oils). The removal efficiency for these machines is 50%, assuming a smoothly paved surface, particles greater than 400 microns, and the absence of parked vehicles. These are less expensive to operate than vacuum sweepers.

Vacuum-type street sweepers are more efficient in removing dust and dirt particles (about 90%) than mechanical broom sweepers. However, vacuum sweepers are ineffective when the pavement is wet.

Maintenance

In order to increase the effectiveness of street sweeping, roads should be kept well-surfaced.