Municipalities sweep their streets for three reasons: aesthetics, air quality, and stormwater quality. Residents like to see tidy streets but often are unaware of the other benefits of street sweeping. As a result, when city budgets tighten, expenses associated with street sweeping may be cut due to the misperception that the only value sweeping provides is visual. This misperception could prove costly to the environment and the budget.

CLEANER AIR

Any sweeper that is used properly will help efforts to reduce air pollution. Although they may not pick up minute particles, sweepers pick up sand and other road debris before fine particles from those substances become suspended in the air, causing air pollution.

To remove debris effectively, sweepers must be properly maintained. A sweeper that generates dust while sweeping is either being operated incorrectly or may have a maintenance problem. Many such issues occur as a result of budget cuts, with operators feeling pressured to save time and money.

For conventional street sweepers that use water to sweep, it is important to use enough water to control dust while keeping street wetting to a minimum. The exact amount of water needed will vary with the humidity and quantity of dust present. If operators are concerned about water usage or the downtime incurred by filling up a tank, they may not stop to add needed water.

In most cases, dust-control water is supplied through the fire hydrant system. In geographic areas where water is scarce, recycled treatment-plant water has been employed as sweeper dust-control water. The results of recycled water use have been mixed as initial reports indicated spray water filter plugging and pump damage from debris. Recycled water needs to be filtered to the purity of potable water or damage may occur.

Replacing sweeper brushes regularly will also help control air particles. No matter what kind of sweeper is used, the general rule is that once the brush length gets down to 6 inches, the brush should be replaced. Operators who don’t adjust or change brushes as needed may think they are saving money by maximizing the life of the brush. However, sweepers operating with worn or misadjusted brushes do not effectively remove dirt, so (continued)
operators are actually spending money unnecessarily.

CLEANER WATER
Used with proper frequency, sweepers can also help reduce water pollution. According to a recent water protection report by the Center for Watershed Protection, streets should be swept twice per rain event for effective results — once beforehand to prevent accumulated debris from being flushed into the watershed and once afterward to capture debris washed into the street by the rain event.

It is important to remove street debris before it rains or the rain will carry the material into the storm drains. Then it may become necessary to use a vacuum truck to remove the debris before it reaches the waterways.

The average street has about 1,000 pounds of debris per curb mile, and the average sweeper is capable of picking up about 5,000 pounds of debris per mile.

In areas where there are uncurbed streets, frequent sweeping isn’t as necessary because rain washes debris into the grass, brush, and ditches. On a curbed street, however, dirt is guided straight into the storm sewers.

ALL-SEASON SWEEPING
Municipalities may maximize the pollution control benefits by sweeping streets year-round. In northern regions, however, sweepers that use water should be put in storage at the first freeze.

An alternative waterless technology is available that relies on brooms to pick up leaves and light litter. The brooms are enclosed with flexible shrouds that prevent dust from escaping. A powerful vacuum fan creates an air stream through the debris hopper, conveyor, and skirted areas. The inward-rushing air carries airborne dust into the debris hopper, where it settles with the rest of the swept debris.

A long-life, dry filter element installed between the hopper and the vacuum fan prevents dust from being pulled from the hopper and blown out the exhaust fan.

Dry sweepers improve air and water quality by removing fine particles that if over-wetted would otherwise remain as a paste on the ground. After drying, that paste could be blown into the air or washed into the watershed. Dry dust control sweepers also are easier to clean because of reduced mud buildup. The additional dust control components increase purchase and maintenance costs, but these increases may be offset by decreased water cost, cleanup cost, and increased productivity.

Some sweepers pick up large debris such as mufflers and tires. Others concentrate on small debris that pollute air and water. Some city managers have found tandem sweeping to be an effective method. They send out a heavy-duty mechanical broom sweeper to pick up large debris, followed by an air sweeper.

The variety of sweepers on the market all work differently and offer different benefits, but an aggressive sweeping program utilizing any type of modern sweeper will provide positive results. PW

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