

Street Sweeping:

Clearly America's *First Line of Defense* for Stormwater Pollution Runoff Abatement

A podcast discussion with:

Ranger Kidwell-Ross, M.A.

Editor



Executive Director



Pavement-Based Stormwater Pollution



What it is...

When precipitation falls on our cities and towns it runs across hard surfaces - like rooftops, sidewalks and roads - and carries pollutants, including nitrogen and phosphorus, into local waterways.

Nitrogen and phosphorus, the most serious pollutants, are primarily from fertilizers and pet and yard waste.

Pavement-Based Stormwater Pollution



The seriousness of the problem...

Nutrient pollution can create dead zones - areas in water with little or no oxygen - where aquatic life cannot survive.

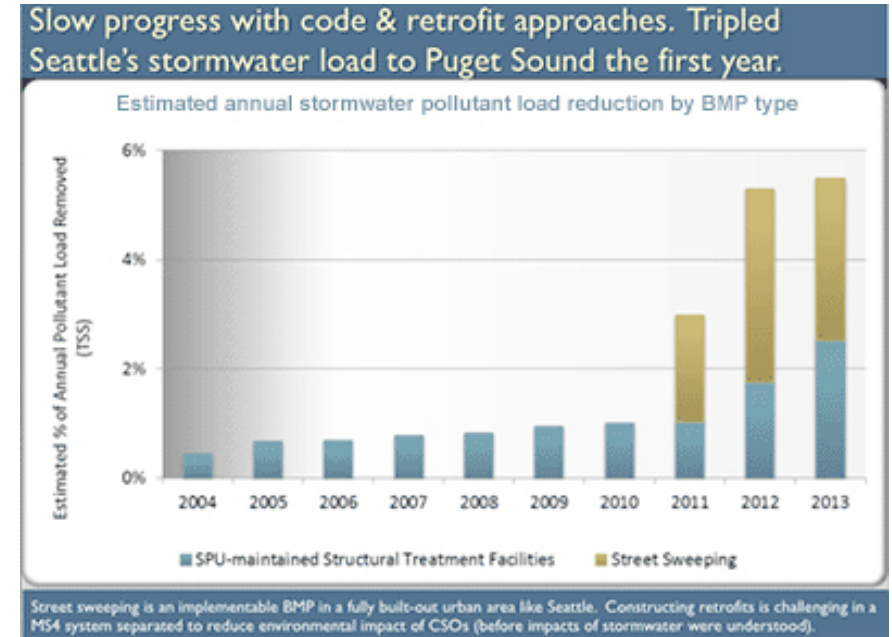
Over 166 dead zones have been documented nationwide, affecting waterbodies like the Chesapeake Bay and the Gulf of Mexico.

Modern air sweepers vastly increase the ability of sweepers to pick-up pollutants and remove them from stormwater



- Use of regenerative air and vacuum sweepers (i.e., air sweepers) has vastly improved pickup efficiency of particles of all sizes especially those under 250 microns — by far the most bioavailable and mobile fraction of all debris sizes. **Removals of 90% to 95% have been achieved.**

Seattle's 2009 Street Sweeping Pilot suggested that adding sweeping as a 'stormwater pollutant runoff approach' could significantly increase the mass amount of pollutant removal from stormwater



- When Seattle enacted sweeping as adjunct to existing end-of-pipe solutions in 2011 they determined that over a 2-year period they increased the amount of pollutants being removed from stormwater by over 300%.
- Further study by Seattle resulted in doubling of budget for sweeping.
- Source: www.worldsweeper.com/Street/BestPractices/SeattleSweepingProgram6.15.html

2007, 2011 and 2019:

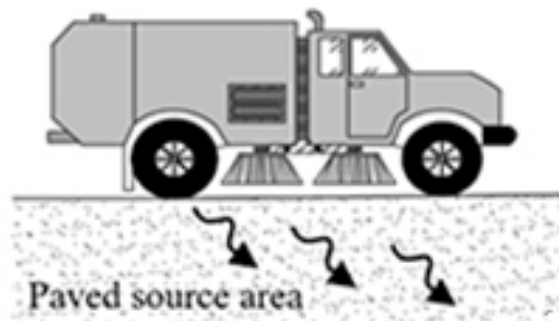
Studies conducted by the U of Florida involving 12 to 14 Florida MS4s in association with the Florida Stormwater Association found street sweeping was the best BMP - up to almost *seven times more cost-effective* than any other of the BMPs for TN and TP recovery



- Studies measured the amount of material captured by the complete range of all available BMPs — from sweeping to catchbasin cleaning to a variety of structural end-of-the-pipe measures.
- Cost of capturing a pound of nitrogen and/or a pound of phosphorus was calculated for each type of BMP recovery method.
- Sweeping was the lowest cost per pound; catchbasin cleaning was 2nd in all instances.

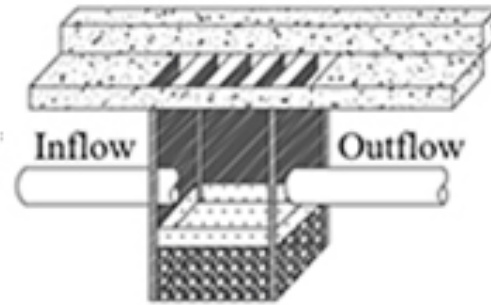


Relative costs of removing Total Nitrogen (TN)



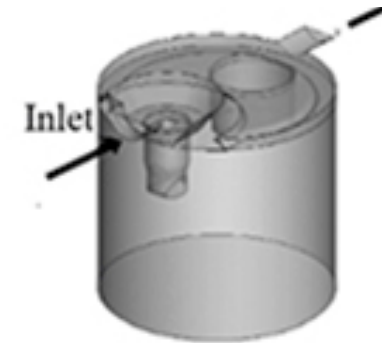
Street Sweeping
(SS)

\$189 / lb.



Catch Basin
(CB)

\$1,162 / lb.



Best Management
Practice (BMP)

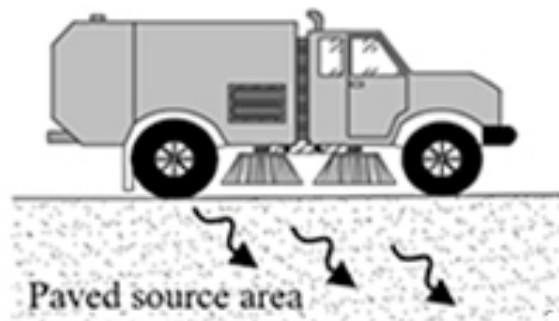
\$2,173 / lb.

Study data combined broom and air sweeper performance: air sweeper data expected to be better.

Source: www.worldsweeper.com/Street/Studies/UFloridaSansaloneInterview12.19.html

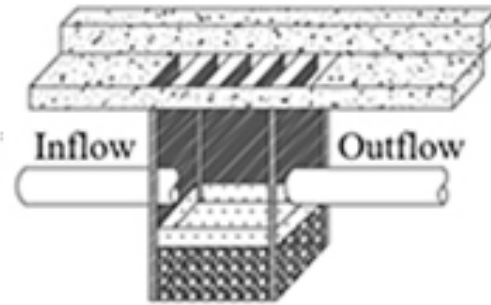


Relative costs of removing Total Phosphorus (TP)



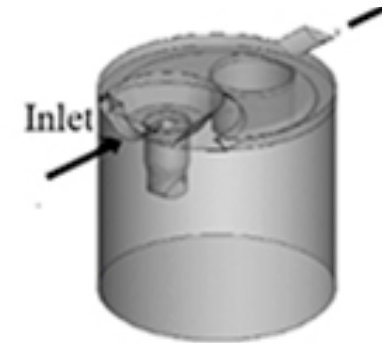
Street Sweeping
(SS)

\$294 / lb.



Catch Basin
(CB)

\$1,894 / lb.



Best Management
Practice (BMP)

\$12,006 / lb.

Study data combined broom and air sweeper performance: air sweeper data expected to be better.

Source: www.worldsweeper.com/Street/Studies/UFloridaSansaloneInterview12.19.html

Recovery of Particulate Material (PM) Matters *(Proving That Street Dirt Pick-Up Recovery Also Matters!)*

The Florida studies found street sweeping to be the most economical and dominant practice that MS4s could implement and optimize, in order to maximize nutrient (TN and TP) and particulate matter (PM) recovery benefits to urban drainage systems and the receiving waters they discharge to.

The study showed conclusively that the recovery of particulate material matters and the more PM an MS4 recovers the more the pollutants are reduced! **The study results are statistically defensible at a 95% confidence level (CL) when combining all 14 MS4s for PM, TN and TP.**

For More Information...

As of 2021, Ranger Kidwell-Ross was in his 34th year of work within the power sweeping industry. For answers or assistance with any aspect of your sweeping program, contact:

Ranger Kidwell-Ross, M.A.



Principal/Editor, WorldSweeper.com
Executive Director, World Sweeping Association
360.739.7323
ranger@worldsweeper.com