Center for Environmental Excellence

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AASHTO

U.S. Department of Transportation
Federal Highway Administration

Web Forum: Efficient, Effective and Innovative Water Quality BMPs

Summary

May 2, 2018, 2:00 pm – 3:30 pm (ET)

A web forum was held for Departments of Transportation (DOT) stormwater practitioners to discuss the organizational attributes that are key to promoting surface water quality protection, including insights into the practice of these attributes and the integration of stormwater program requirements into day-to-day business practices of the DOT organization. The following is a brief summary of the main points discussed by each of the presenters.

- Bhaskar Joshi, PhD, PE, Chief, Office of Stormwater Program Development, California Department of Transportation (Caltrans), *Open Graded Friction Courses (OGFC)*

  An introduction to open graded friction course (OGFC) was provided, as well as a discussion of its benefits, implementation, the pilot study testing results, maintenance practices, and selection. OGFC, also referred to as open graded asphalt concrete (OGAC), is a surface course with an aggregate gradation that provides an open void structure as compared with conventional dense graded asphalt concrete. It is used for new construction, major rehabilitation, maintenance overlays, and high traffic volumes. The porous nature of OGFC mixtures allows surface water to quickly drain away from the surface by allowing the water to flow through the mixture. Roadway safety benefits of OGFC include improved stopping distance, visibility, contrast in pavement markings, drainage, and surface friction. Environmental benefits include noise reduction and stormwater treatment. Additional benefits include improved ride quality and enhanced resistance to reflective cracking. It is particularly useful in limited right-of-way locations such as highways in highly urbanized areas and mountainous roadways. Finally, it combines water quality benefits and roadway improvements into one investment. For stormwater treatment, OGFC can be considered a flow-through treatment device, and the DOT may calculate and claim credit for stormwater treatment. Its pollutant removal mechanism consists of straining and a reduction in splash and spray. In 2007, a pilot study was initiated by California Department of Transportation (Caltrans) at 14 monitoring stations at seven locations. The study concluded that OGFC reduced the amounts of total suspended solids (TSS), total phosphorus, total copper, total lead, and total zinc, as well as nutrients and metals. Implementation challenges include demonstration of treatment efficiency, treatment BMP ranking, tracking of treatment credits, and maintenance operations and equipment.

- Jana Ratcliff, Washington State Department of Transportation, ***Innovative Roadside BMPs***

  An introduction to low cost best management practices (BMPs) to manage stormwater, including low impact development (LID) BMPs was provided. The goal is to treat large amounts of pavement within a relatively small footprint, therefore not requiring additional right of way; improve construction and maintenance ease of access from the roadway; and identify low-cost, well-performing BMPs with low maintenance requirements. To meet these goals, WSDOT commonly uses vegetated filter strips (VFS), compost amended vegetated filter strips (CAVFS), and media filter drains (MFD). VFS are compacted roadside embankments, are simple and cost-effective, improve water quality by using filtration to reduce pollutant concentrations, and can be located on existing roadside embankments, reducing the need for additional right of way acquisitions. CAVFS is a long, linear BMP that can improve infiltration, increase surface roughness, and improve plant sustainability compared to a standard VFS. It meets basic and enhanced runoff treatment objectives in Washington State and can be used to meet oil control requirements in eastern Washington. WSDOT is currently evaluating the effectiveness of a Modified Vegetated Filter Strip (or compost-blanket VFS) to increase pollutant removal efficiency over the standard VFS, while avoiding the soft-shoulder created by the CAVFS. MFD is a linear flow-through BMP that can be sited on highway side slopes and medians. Treatment is provided through physical straining, ion exchange, carbonate precipitation, and biofiltration. Another topic discussed was infiltration and water loss on roadway embankments. WSDOT is working to develop an accurate and cost-effective method for estimating saturated hydraulic conductivity rates and water losses on highway embankments.

- Nick Tiedeken, Minnesota Department of Transportation, ***Winter Storm Management***

  Minnesota DOT is striving for the most efficient and effective methods of snow and ice control to prevent road salt from entering lakes and rivers. The goal is to control ice and snow in the safest and most economical, and environmentally sound ways possible. Factors affecting winter severity include dewpoint/relative humidity, wind speed, frost/black ice, precipitation, temperature of air and road, cloud cover, blowing snow, and surface pressure. BMPs for snow and ice control include training, storage and loading, equipment calibration and upgrades, liquids-anti-icing, prewetting, alternative deicers, blowing snow control, road weather technology, innovation, research, and traveler information. MNDOT conducts training such as the snow and ice event/bare lane training. Important tools include a snow and ice control field handbook for snowplow operators, snowplow salt and sander controller calibration guide, plows and blades, brine tank and spinner, anti-icing, approved winter chemical and non-chloride chemical products, blowing snow control, snow fences and earthwork for drift control, road weather information system, weather stations, maintenance decision support system (MDSS), and automated vehicle location. MNDOT has a five-year sustainability target of using less than 10 percent more than the MDSS recommended salt use. Innovations being investigated are slurry trucks and plow drivers with a new, hybrid plow design. Other strategies to control snow and ice include use of ongoing research, traveler information websites, weather stations, and plow cameras. There total maximum daily loads (TMDLs) for chloride in 23 lakes, ponds, and wetlands, and 15 streams. The state environmental agency is taking a performance based TMDL approach, focusing on improving winter maintenance practices, minimizing use of salt,

performance based strategies, using a web based winter maintenance assessment tool (WMAt), water quality monitoring, and developing a future statewide chloride plan. The overall MNDOT Salt Sustainability Program consists of a literature search for salt reduction strategies, compilation of BMPs, training materials and guides, an annual salt reduction measurement tool, and a final report.

After the presentations, the panelists addressed the questions submitted by the attendees.

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