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2. Management systems, like pavement management systems, were generally used to provide data to support capitalization of assets for depreciation-based reports.

   However, capital improvement planning documents and other financial records were generally the primary resource for identifying historical costs and historical activities.

3. When asked about the value of creating a GASB 34-compliant financial report, the majority of financial managers viewed capitalizing infrastructure assets as a bookkeeping exercise of dubious value.

A few managers thought it might help future budgeting for capital improvements and preservation. By knowing the magnitude of asset depreciation, cities might seek to fund costs of depreciation.

Some financial managers even noted that interest in asset preservation was helping promote the concept of asset management.

The majority of financial managers viewed capitalizing infrastructure assets as a bookkeeping exercise of dubious value.

Still, there seemed to be little interest in eventually migrating to a preservation approach for financial reporting.

Reconsidering GASB 34

Like the APWA and AASHTO, we at CTRE have strongly promoted the modified approach. As engineers and planners, we believe that the modified approach is the technically correct way to manage infrastructure assets. We believe that asset management provides value and improves decision making.

Initially we thought that an accounting standard would be an on-ramp to asset management. Instead it seems to be no more than an interesting detour.

Bottom line

GASB 34 is an accounting standard, and the purpose of accounting standards is to create uniform financial reports so that creditors and the public can understand the fiscal operating performance, solvency, and creditworthiness of an agency.

Local governments shouldn't adopt asset management systems because of an accounting standard. They should adopt them because such systems improve the return the public receives from its investment in public infrastructure. •

Overview of methods for controlling erosion and storm water

THE DEADLINE for public agencies to comply with Phase II of the Environmental Protection Agency (EPA) storm water regulations is March 10, 2003. (See the September–October 2002 issue of *Technology News*.)

One tool for meeting the requirements is preventing or controlling erosion on roadside slopes and ditches.

The deadline for complying with EPA Phase II storm water regulations is March 10, 2003.

Erosion control methods

Agencies can stabilize soil (*stabilization methods*) or build structures (*structural methods*) in slopes and ditches to help control erosion and runoff. Both methods can be *temporary* or *permanent*.

Temporary measures are used on highly erodable slopes until vegetative growth is sufficient to hold soil in place. Permanent stabilization methods are used to protect erosion-prone slopes after construction, when no further disturbances are expected.

Temporary stabilization methods

- *Mulching.* Various organic or synthetic materials are applied to the slope. They may also help protect and stimulate growing vegetation.
- *Erosion control blankets.* Synthetic or biodegradable blankets are placed on slopes for several months until vegetation can grow. Blanket types are chosen based on the topography of the slope. They include wood fiber, straw/coconut, straw, and bonded fiber blankets.
- *Temporary seeding.* Rapid-growing annual grasses are seeded into slopes to provide a root base to hold the soil in place during and after construction.

Permanent stabilization methods

- *Turf reinforcement mats (TRMs).* TRMs are placed on slopes similar to erosion control blankets. However, TRMs combine vegetation and synthetic materials to form a strong, permanent mat.
- *Permanent seeding.* Perennial grasses are also seeded into slopes. Although they develop more slowly than annual grasses, they can withstand cooler seasons. Worker can also plant legumes, which produce their own nitrogen and grow even in less fertile soil. Two commonly used legumes that prosper in Iowa are Crown vetch and Sericea lespedeza.
- *Sodding.* Sod is placed on slopes and provides immediate turf stability and establishes a strong root system in a short amount of time.
- *Topsoiling.* Previously used or organically enriched soil is placed over exposed subsoil to encourage the growth of vegetation. It may be followed by permanent seeding with grasses or other perennials.

Temporary structural methods

- *Check dams.* Check dams are placed in ditches or waterways and prevent soil erosion by reducing the speed of water flow. These dams may consist of straw bales or riprap and can reduce the water's effect on the soil.
- *Slope drain.* Slope drains are flexible or rigid conduits that transport runoff water down exposed slopes. These drains can be used during construction, until permanent drain structures are installed.

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A silt fence is placed near a slope drain to prevent soil and silt from washing down the right of way.

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- *Silt fences.* Silt fences filter sediment before runoff leaves the construction site. These fences are usually synthetic filter fabrics attached to posts embedded into the ground.

Permanent structural methods

- ***Energy dissipaters.*** Energy dissipaters reduce water velocities at pipe outlets to prevent scouring (soil stripping caused by water force). The types of energy dissipaters include the hydraulic jump, impact basin, drop structure, riprap basin, and stilling well.
- ***Riprap.*** Riprap is the use of stones, either loose or anchored with mortar, to construct or strengthen a slope. When applied to slopes, riprap protects the soil and slows the water flow. Six main types of riprap can be used to help prevent erosion: dumped, hand-placed, wire-enclosed, grouted, concrete, and concrete-slab. Riprap may also be used as a temporary erosion control method.

Before riprap may be laid, a filter layer should be placed on the bank. The filter layer, or blanket, can help prevent water from eroding bank soil from between the gaps in the riprap cover. A bank with only a slight grade may not require a filter layer.

Storm water filtration and detention methods

Agencies may also need to engage in storm water management practices unrelated to erosion control. For instance, the following techniques can be used to direct storm water runoff and filter out runoff pollutants:

- ***Vegetated swales.*** A vegetated swale is a permanent, broad, shallow channel with vegetation covering the side slopes. It is placed on property lines that have a natural grade or may be used in place of a curbs, gutters, and storm sewer systems.
- ***Sand filters.*** Sand filters consist of a set of chambers or basins that remove several common pollutants from the storm water. They are built underground and may outlet to a storm drainage system or directly to surface water.
- ***Bioretention.*** Bioretention uses soil and both woody and herbaceous plants to biologically remove runoff pollutants. Runoff passes over a sand bed, which slows its velocity and distributes it evenly along the length of a ponding area. The ponding area is where the water is stored until it evaporates or is gradually absorbed by surrounding vegetation.
- ***Infiltration drainfields.*** Storm water is diverted into a storm sewer system that passes through a pretreatment structure. The structure removes coarse sediment, oil, grease, and other pollutants from the water. The water continues through a perforated pipe that distributes the runoff evenly through the drainfield. Then the water filters down into the subsoil where it is absorbed.
- ***Infiltration trenches.*** Three-foot wide trenches are filled with stone and a six-inch diameter perforated PVC pipe. As storm water enters the pipe, it is evenly distributed into the subsoil.
- ***Porous pavement.*** Porous pavement is a special type of pavement that allows storm water to pass through it and into the subsurface. It reduces the amount of runoff. If properly maintained, porous pavement may filter some runoff pollutants.
- ***Storm water wetlands.*** Wetlands, both manmade and natural, function as storm water pollution prevention mechanisms by providing a place for water to go. Wetlands are natural filters where chemicals break down and encourage vegetative growth.
- ***Wet detention ponds.*** Wet detention ponds are structures built to detain and treat contaminated storm water. Runoff from a storm is detained and treated until it is "pushed" into a spillway by runoff from the next storm.
- ***Baffle boxes.*** Sediment removal boxes are similar to sand filters. They are subsurface concrete boxes that allow coarse sediments to settle while storm water continues to flow.

This picture shows two different types of erosion control: stones lining the bank of a waterway and silt fences in the road's right of way to hold soil and silt in place.

For more information

Information in this article is adapted from the U.S. DOT's *Best Management Practices for Erosion and Sediment Control* and from the EPA's *Best Management Practices for Storm Water*. For more information contact Jim Hogan, CTRE library coordinator, 515-294-9481, hoganj@iastate.edu. •