



**U.S. Environmental Protection Agency**

## Polluted Runoff (Nonpoint Source Pollution)

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# Planning Considerations for Roads, Highways and Bridges

United States  
Environmental Protection  
Agency

Office of Water  
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The Coastal Zone Act Reauthorization Amendments (CZARA) of 1990 established goals to be achieved for the prevention and control of runoff pollution to our coastal waters. The Environmental Protection Agency (EPA) published *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters*, which identifies management measures and best management practices for nonpoint source (NPS) pollution control.

Our roads, highways and bridges can be a source of a significant amount of pollution to our nation's water. Pollution is generated during road construction, maintenance, and use. Nonpoint source pollution, or runoff pollution, is created when chemicals, debris, fertilizers, automotive oils, debris from wearing parts, and litter are washed off roadways and bridges during rainstorms and carried as runoff to streams, rivers, lakes and bays.

There are many opportunities available to prevent and control runoff pollution by applying management measures and best management practices during the planning, construction, and operation and maintenance of highway systems. Management measures are achieved by applying best management practices appropriate to the source of runoff, climate, and average daily traffic volume. Planning considerations to help control runoff pollution from roads, highways, and bridges are discussed in this fact sheet.

## Road, Highway and Bridge Planning

Poor planning can contribute to pollution problems. Wetlands and vegetated areas near waterbodies can be damaged by construction, decreasing the water quality benefits that they normally provide. Areas susceptible to erosion, such as steep slopes or land with loose soil, can be disturbed, causing increased sedimentation flows into receiving streams.

As plans are developed for new roads, highways and bridges, or for reconstructing existing facilities, best management practices to help reduce the volume and concentration of erosion and sedimentation produced by the project should be incorporated into project design.

The following are some pollution prevention techniques that can be incorporated into highway planning and design:

- **Evaluate alternatives for incorporating a road system or bridge into the natural characteristics of the site.** Analyze environmental features, such as topography, drainage patterns, soils, climate, and existing land use. Natural drainage systems can be taken advantage of, clearing and grading can be minimized, natural vegetation and buffer areas can be preserved, and sensitive land and water areas that provide water quality benefits (e.g., wetlands, spawning waters, etc.) and areas susceptible to erosion and sedimentation can be avoided.

- **Preserve corridors for highways well in advance of construction to be certain that roads are built where they are most suitably located in terms of environmental and economic considerations.** Lack of advance planning can lead to locating roads wherever space is available, or not being able to build a road at all.
- **Avoid building roads and bridges where they will impact riparian areas adjacent to surface waters and wetland areas.** These vegetated areas provide enormous water quality benefits through their ability to filter pollutants out of water passing through them.

## Road, Highway and Bridge Construction

Road, highway, and bridge construction and reconstruction generate runoff pollution by virtue of the sheer volume of earth that must be disturbed and topsoil that is removed during these activities. For example, roads built perpendicular to slopes rather than parallel to them cut across natural drainage lines and create excessive earth disturbance.

Planning for pollution prevention and control measures in advance of and during construction can help avoid these and other future problems.

### Erosion and Sediment Control

Develop a site-specific erosion and sediment control plan to minimize the impacts of runoff waters on construction activities.

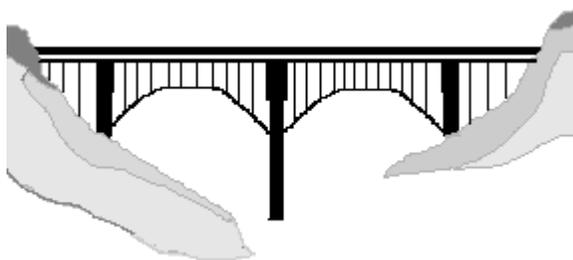
A number of provisions to lessen the environmental impacts of road construction are specified in an erosion and sediment control plan, including measures to ensure that exposed working surfaces are kept to a minimum, silt fences and sediment traps are optimally placed to prevent sediment from reaching drainage systems, vehicles are washed when leaving a construction site to remove excess mud, and temporary exit/entry roads to construction sites are provided with a coarse rock surface to prevent the transfer of soil offsite where it will be washed into nearby drainage channels.

### Chemical Use and Control

Store, handle and dispose of construction site chemicals such as herbicides, insecticides, oils, gasoline, degreasers, antifreeze, concrete and asphalt products, sealers, paints, and wash water associated with these products to minimize their entry into runoff. One way to do this is to provide specific areas where these products are frequently used, such as fueling areas and equipment washing areas. This can help prevent dangerous chemicals from entering surface waters. This measure also applies to proper storage of road deicing materials.

### Nutrient Use and Control

Fertilizers used to promote the growth of vegetation on disturbed earth can contribute excessive nitrates and phosphates to surface waters if overused. To ensure safety, a person knowledgeable of and certified for soil testing and nutrient application should be involved to determine the proper amount of fertilizer to apply in a given situation and the proper timing of applications to maximize their delivery to growing plants and minimize their entry into runoff.



## Road, Highway and Bridge Operation and Maintenance

Road, highway, and bridge operation and maintenance involve inspection, routine and season-specific maintenance, and repair of not only highways and bridges but also the rights-of-way where drainage control facilities are located. The following are examples of some maintenance activities that provide opportunities to prevent and control runoff pollution:

### Inspection and General Maintenance

- Develop an inspection program and schedule to ensure that general maintenance is performed. Inspect erosion and sediment control devices regularly.
- Maintain retaining walls and pavements to minimize cracks and leakage.
- Repair potholes.
- Maintain energy dissipaters and velocity controls to minimize runoff velocity and erosion.
- Properly dispose of accumulated sediment collected from detention ponds, drainage systems, and pollution control structures, and any wastes generated during maintenance operations, in accordance with appropriate local, state and federal regulations.
- Use techniques such as suspended tarps, vacuums or booms to prevent paint, solvents and scrapings from becoming pollutants during bridge maintenance.
- When blading gravel roads, take care to maintain a structurally sound surface while providing an adequate crown and drainage so that erosion or scattering of gravel are avoided.
- Develop an infrastructure safety inspection program in conjunction with general maintenance.
- Keep drainage ditches free of debris.

### Snow and Ice Control

- Cover salt storage piles and other deicing materials to reduce contamination of surface waters. Locate them outside the 100-year floodplain.
- Regulate the application of deicing salts to prevent oversalting the pavement.
- Use trucks equipped with salt spreading calibration devices.
- Use alternative deicing materials, such as sand or salt substitutes, where sensitive ecosystems should be protected.
- Prevent dumping of accumulated snow into surface waters or onto frozen water bodies.

### Right-of-Way Maintenance

- Seed and fertilize, seed and mulch, and/or sod damaged vegetated areas and slopes.
- Establish pesticide/herbicide use and nutrient management programs.
- Restrict herbicide and pesticide use in highway rights-of-way to applicators certified under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) to ensure safe and effective application.
- Limit the use of chemicals such as soil stabilizers, dust palliatives, sterilants, and growth inhibitors to the best estimate of optimum application rates. Try to avoid excess application and consequent intrusion of such chemicals into surface runoff.
- Regularly clean, reshape, and revegetate drainage ditches to ensure they perform as desired. Keep ditch slopes covered with vegetation or other material.
- Maintain shoulders, slopes and swales to assure their function and operation.

### Road Cleaning and Debris Removal

- Sweep, vacuum and wash residential streets and parking lots.
- Collect and remove road debris.
- Encourage litter and debris control management.
- Encourage development of Adopt-a-Highway programs.

*This fact sheet is the second in a series being produced jointly by EPA and the American Public Works Association (APWA) to improve knowledge about and efforts to control runoff pollution from roadways and road construction activities. Working together, we can maintain and improve our roadway systems and*

*protect our waters.*

## Sources of Additional Information

### United States Environmental Protection Agency Nonpoint Source and NPDES Storm Water Coordinators:

**U.S. EPA Region I** (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont) NPS (617) 565-4426, NPDES Storm Water (617) 565-3610

**U.S. EPA Region II** (New Jersey, New York, Puerto Rico, Virgin Islands) NPS (212) 637-3700, NPDES Storm Water (212) 637-3767

**U.S. EPA Region III** (Delaware, Maryland, Pennsylvania, Virginia, West Virginia) NPS (215) 597-9077, NPDES Storm Water (215) 597-6511

**U.S. EPA Region IV** (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee) NPS (404) 347-2126, NPDES Storm Water (404) 347-2019

**U.S. EPA Region V** (Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin) NPS (312) 353-2079, NPDES Storm Water (312) 353-2121

**U.S. EPA Region VI** (Arkansas, Louisiana, New Mexico, Oklahoma, Texas) NPS (214) 665-7135, NPDES Storm Water (214) 665-7170

**U.S. EPA Region VII** (Iowa, Kansas, Missouri, Nebraska) NPS (913) 551-7030, NPDES Storm Water (913) 551-7034

**U.S. EPA Region VIII** (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming) NPS (303) 293-1565, NPDES Storm Water (303) 293-1623

**U.S. EPA Region IX** (Arizona, California, Hawaii, Nevada) NPS (415) 744-1953, NPDES Storm Water (415) 744-2001

**U.S. EPA Region X** (Alaska, Idaho, Oregon, Washington) NPS (206) 553-4013, NPDES Storm Water (206) 553-0966

**U.S. EPA Headquarters**, Nonpoint Source Control Branch NPS (202) 260-7100, NPDES Storm Water (202) 260-9541

### Federal Highway Administration Local Transportation Assistance Program (LTAP) Technology Transfer (T2) Centers:

The LTAP program provides training and technical assistance to local/tribal government transportation agencies on roads and bridges. For the location of the LTAP T2 center in your state, contact the T2 Clearinghouse at (202) 347-7267.

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