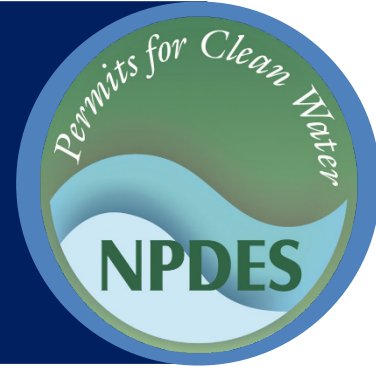




# Stormwater Best Management Practice

## Stormwater Management for Development Districts



**Minimum Measure:** Post Construction Stormwater Management in New Development and Redevelopment

**Subcategory:** Innovative BMPs for Site Plans

### Description

Development districts are special zoning districts created for the purpose of permitting property development. Development districts are larger site areas (typically 5 or more acres), and their construction requires complex and coordinated rezoning, transportation and planning efforts. Examples of special zoning districts include, but are not limited to:

- Transit-oriented development districts
- Business improvement districts
- Traditional neighborhood designs
- Brownfield redevelopment projects
- Main street revitalization districts

Communities typically assess a development district's stormwater management performance at the site, neighborhood and regional (or watershed) levels. Although development districts generally have high percentages of impervious surface, they can allow for greater conservation of surrounding natural areas if municipalities implement them properly and comprehensively. For example, clustered, compact development can accommodate the same level of development (e.g., number of homes, businesses, etc.) on a smaller footprint than conventional, low-density development. If municipalities implement development districts in conjunction with natural area preservation, the net effect can be a reduction in total impervious surface, all while allowing a similar level of economic development. In addition, a coordinated planning effort can help identify strategic opportunities to incorporate green infrastructure practices, such as those listed to the right, and development designs that decrease stormwater impacts.

A city, county or township's planning or zoning department usually develops plans for development districts. Stormwater managers may need to meet with planning counterparts to coordinate plans because common standalone elements found in stormwater management plans for individual sites (e.g., site



Development districts allow for denser development and preservation of surrounding natural areas.

Municipalities should consider the following practices as part of any development district approach:

- Bioretention practices
- Conservation easements
- Elimination of curbs and gutters
- Green parking
- Green roofs
- Narrower residential streets
- Open space design
- On-lot treatment
- Permeable pavements
- Protection of natural features
- Stormwater wetlands
- Street design and patterns

coverage limitations, infiltration requirements and rules discouraging sidewalks) can run counter to the urban design elements of successful development districts.

## Applicability

### Regional Applicability

Development districts can be found in all regions of the United States. They can include large **redevelopment** efforts, infill projects or new “greenfield” projects, and therefore, they depend more on the state of development than on regional location. Development districts also tend to handle more development intensity and mixed-use development on a smaller footprint, thus creating opportunities for watershed planning and source water protection of surrounding undeveloped areas.

### Urban Applicability

Implementing development districts in urban areas can be difficult if most of the land is already developed. Nevertheless, redevelopment is common and can create an opportunity to improve aspects of an existing developed area including development ordinances, stormwater treatment requirements and the incorporation of new, more effective stormwater retrofits (further discussion below). Additionally, certain types of development district planning, such as transit-oriented development and business improvement districts, are common and well-suited to urban areas.

### Stormwater Retrofits

Because urban projects often involve redevelopment, they can offer opportunities to include both stormwater retrofits of older “gray” infrastructure and urban “green” techniques. For retrofits, cities may consider offering flexible approaches to meet the variety of unexpected site constraints found in highly developed urban areas.

## Design Considerations

The design of a development district determines its effectiveness in mitigating stormwater impacts. Implementing **smart growth** practices that promote high-density development—walkable and bikeable neighborhoods, preserved green spaces, mixed-use development and mass transit—can be an effective way to facilitate effective stormwater management within the development district. Specifically, development district designs should consider the following:

**Compact project and community design:** A powerful strategy for reducing a development’s footprint—and its stormwater impact—is to focus on compact development

and effective **infrastructure planning**. Clustering is one approach that can concentrate impervious surfaces, leaving more area as undeveloped or green space. Reducing an individual building’s footprint can also be a strategy to lessen urban stormwater impacts, though some circumstances call for greater lot coverage in districts that need higher development intensity (e.g., near transit stations). Compact development also can create additional space for more environmentally friendly transportation options, such as walking and biking or shorter and less frequent automobile trips.

**Street design and transportation options:** Well-designed, compact communities contain highly connected street and trail systems that accommodate multiple modes of transportation. The pattern does not need to be a grid; in some areas, topography and environmentally sensitive areas influence where roads go. A compact district also provides for more efficient use (and reuse) of infrastructure.

**Mixed-use development:** A community’s transportation options increase when jobs, housing and commercial activities are close to one another. Efficiencies for providing infrastructure emerge. Fewer automobile trips reduces the need to accommodate standard parking requirements. Mixing daytime and nighttime uses increases opportunities for businesses to share parking spaces.

City and county planners can establish development districts almost anywhere; however, some design considerations are worth accounting for based on existing land uses. For urban areas, planners should reuse existing impervious surfaces and infrastructure wherever possible. In addition, they should manage stormwater on-site wherever feasible using green infrastructure such as **rain gardens**, **permeable pavement**, **green roofs** or other on-site practices.

Conservation subdivisions or designs should look closely at the connections among transportation, community services and jobs. If new housing becomes part of a development pattern that includes dispersed uses, demands for upgrades to urban-level services and transportation, and a lack of connections among infrastructure elements, then this can negate the water benefits of conservation clustering.

## Limitations

During the site design process, there may be pressure to leave out elements of the development district's stormwater management features. For example, a successful development district shortens, combines or eliminates automobile trips. However, if pressure to increase parking or decrease connections among uses mounts, a city or county may be unable to reduce the amount of paved surfaces, diminishing transportation and water benefits. In this instance, planners can consider using permeable pavements and other stormwater management techniques.

If the stormwater regulations for redevelopment districts are more stringent than those for greenfields, then cities may find it difficult to attract developers. Rules for water protection and stormwater should be consistent watershed-wide.

## Maintenance Considerations

Maintenance considerations for development districts depend on the types of practices that a district incorporates. For example, development districts may implement a mix of green infrastructure and good housekeeping practices to meet stormwater treatment requirements. Planners should account for the maintenance requirements of proposed practices so that the development district can meet design and water quality goals within available budgets. Other fact sheets on EPA's [Menu of BMPs](#) Web page provide additional information on the maintenance considerations of individual practices.

## Effectiveness

A development district can be effective at the site, neighborhood and watershed levels. Redevelopment can significantly reduce the demand for new development elsewhere in the watershed. Designs that repair existing infrastructure and treat stormwater on-site are particularly beneficial. Where urban redevelopment occurs on open lots that serve a stormwater-handling function, the city and developer should assess the neighborhood-wide impacts and mitigate accordingly.

Clustering, [open space design](#) and other "green" designs offer stormwater and water quality benefits to communities considering new housing developments. However, a site's design should combine with watershed

and regional planning designs that curb uncontrolled, large-scale growth. The following questions are examples of considerations that developers can consider when identifying desired neighborhood and watershed outcomes:

- Will new conservation development spur unplanned development?
- Does conservation development complement the community's overall conservation goals?
- How does the new development relate to jobs, schools and services?

## Cost Considerations

The costs of developing and implementing coordinated development districts vary. The primary drivers of these costs include the consultant and staff time required to develop or align plans; repairs to or establishment of water, sewer, and transportation infrastructure; and any incentives a city, county, or township provides to developers or public/private partnerships.

For developers, costs can vary from a conventional site plan, depending on the combination of stormwater controls and the relative cost of a more complex site development plan. However, the market price due for these developments, related to their location or enhanced desirability, can offset these costs in many redevelopment projects.

## Combinations of Policies and Best Management Practices (BMPs) to Support Development Districts

A combination of practices support a development district's environmental performance. These include traditional stormwater control measures, emerging stormwater practices and land development policies that one might not traditionally view as stormwater BMPs. The following section offers a non-exclusive summary of BMPs that design engineers may use within a development district. How engineers ultimately select practices also depends on pollutant control requirements, as well as other water quality and quantity imperatives such as total maximum daily loads or downstream flooding.

## Urban Settings

Urban development and redevelopment projects are more likely to have heavier transit service (i.e., subways and established bus lines), follow a traditional street pattern, and be subject to a complex set of existing land development requirements.

Municipalities can combine policies to promote desired densities. Some of these policies include:

- Creating transfer-of-development-rights receiving zones—a system in which a landowner in a “preservation area” or “sending zone” gets credits for foregoing development rights, which they can then sell or have a bank consolidate. Developers can buy and use these credits to gain permission to build in higher-density receiving zones, which are areas municipalities have targeted for denser development.
- Allowing the creation of bonus densities, which enable developers who agree to complete projects or project additions meeting specific goals to increase density.
- Creating mixed-use zoning.
- Creating form-based zoning codes.
- Modifying parking policies that, for example, allow a maximum number of parking spaces and better manage on-street parking.
- Creating sidewalk improvement programs.
- Encouraging micro-detention stormwater-handling areas, such as rain gardens or stormwater control measures that serve multiple purposes (e.g., [green roofs](#)).
- Encouraging street tree canopy programs.
- Creating financial incentives (e.g., tax-increment financing, vacant property reform).
- Enacting or promoting programs that enhance transit use (e.g., customized information, employer assistance).
- Enacting rehabilitation codes for older buildings and proprietary devices (e.g., in-pipe filtration devices).

## Suburban Settings

Suburban development districts are likely to take advantage of existing development and infrastructure,

and they require connections among older developed areas. In addition to some of the policies and practices listed above for urban settings, planners and developers in suburban settings could consider stormwater control measures and policies that help protect water resources, such as:

- Promoting “grayfields” programs to redevelop underperforming malls and strip malls.
- Creating highway corridor redevelopment programs.
- Enhancing retail and housing districts around park-and-ride lots.
- Adopting smart growth street design standards at the local and state level.
- Establishing infill policies.
- Adopting traditional neighborhood design manuals that integrate transportation.

## Rural Settings

Municipalities are likely to establish rural development districts on undeveloped or sparsely developed land. Successful rural development districts complement or spur rural employment opportunities in areas such as agriculture, manufacturing, or warehousing and distribution. To protect water resources on a regional scale, planners should encourage conservation of rural settings to offset increased impervious areas in urban and suburban settings.

Several policies that encourage economic development while retaining rural character include:

- Creating transfer-of-development-rights sending zones.
  - Establishing water protection overlay zones.
  - Connecting housing with rural job and transportation centers.
  - Creating watershed-wide impervious surface trading programs.
  - Creating design manuals for rural housing or housing in environmentally sensitive areas.
- Encouraging [main street](#) redevelopment programs in older downtowns.

## Additional Resources

- The Center for Watershed Protection's updated code and ordinance worksheet for improving local development regulations.
- EPA's Green Infrastructure Policy Guides webpage.
- EPA's Smart Growth and Economic Success: Investing in Infill Development webpage.
- The University of Wisconsin Sea Grant's Tackling Barriers to Green Infrastructure: An Audit of Local Codes and Ordinances report.

### Additional Information

Additional information on related practices and the Phase II MS4 program can be found at EPA's National Menu of Best Management Practices (BMPs) for Stormwater website

### Disclaimer

*This fact sheet is intended to be used for informational purposes only. These examples and references are not intended to be comprehensive and do not preclude the use of other technically sound practices. State or local requirements may apply.*