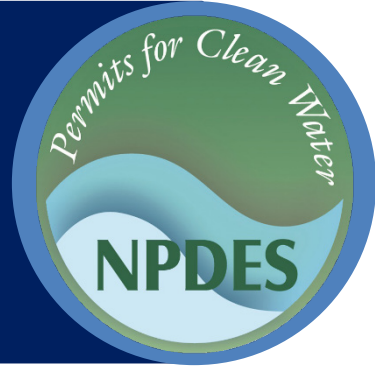




Stormwater Best Management Practice

Redevelopment



Minimum Measure: Post Construction Stormwater Management in New Development and Redevelopment
Subcategory: Innovative BMPs for Site Plans

Description

Although there is no single, nationwide definition, stormwater professionals typically define redevelopment as development on previously developed land. In some states and localities, new development and redevelopment are subject to the same requirements. Redevelopment of existing impervious surfaces can be a key strategy for reducing net increases in impervious surfaces and associated degradation to receiving waters. The use of newer, more effective stormwater management practices can also help improve the treatment of existing stormwater discharges.

Municipalities and property owners can redevelop on a site-by-site basis, but redevelopment can also be part of a larger effort to spur coordinated investment and development across a larger geographic area. Common programs include business improvement districts, Main Street programs for older downtowns, brownfields programs, vacant property campaigns and efforts to revive older, underperforming shopping malls. The transfer of development rights can also help spur redevelopment by directing development demand to existing activity centers.



A before and after redesign option for 6th Avenue in Des Moines, Iowa. The design features green infrastructure, local art and a bus shelter.
Credit: Vireo/BNIM

Related Fact Sheets

The following fact sheets contain additional information on stormwater practices related to redevelopment:

- [Alternative Turnarounds](#)
- [Eliminating Curbs and Gutters](#)
- [Green Parking](#)
- [Green Roofs](#)
- [Open Space Design](#)
- [Infrastructure Planning](#)
- [Protection of Natural Features](#)
- [Right-Sized Residential Streets](#)
- [Site Design and Planning Strategies](#)

Applicability

Redevelopment involves existing developed land and is therefore most common in highly urbanized areas. Still, suburban and even rural areas commonly contain vacant or underperforming properties that may be suitable for redevelopment. Individual jurisdictions within economic development offices or in the local chamber of commerce typically run programs to address redevelopment. On a regional scale, municipal planners can use coordinated redevelopment as part of economic development or stormwater planning programs.

In districts with multiple redevelopment-ready properties, economic factors, such as location to amenities and proximity to transit, guide which properties are a priority

for redevelopment. However, these properties may not be the ones that will deliver the greatest stormwater benefits. It is therefore important to have a clear redevelopment ordinance and [plan review process](#) to ensure redevelopment activities maximize stormwater improvement benefits.

Design Considerations

The stormwater controls chosen for redevelopment should consider the unique circumstances of the redevelopment project. Common land-related constraints include irregularly shaped properties with varying topography, small lots, legacy contamination and noncompliant building features/footprints. Water quality considerations can also influence stormwater control selection. In some cases, the main factor will be flow reduction; in others, the focus will be the treatment of specific pollutants.

For urban areas, micro-detention practices, urban forestry techniques and structured soils are often best. Green building techniques and green roofs may also be good choices. As noted above, cities and counties will want to coordinate infrastructure repair and upgrades with redevelopment efforts so that water and wastewater capacity are not barriers to redevelopment.

Some of the strategies for redevelopment include:

- **Green roofs.** [Green roofs](#) help reduce the urban “heat island” effect and reduce peak stormwater flows by absorbing stormwater on-site. The vegetated cover also helps protect and insulate the roof, extending its life and reducing heating and cooling costs.
- **Micro practices.** Micro practices are intended to treat small amounts of stormwater and occupy small amounts of space. They are therefore often appropriate for redevelopment when space is limited. A single practice rarely manages the entire volume of stormwater generated at a site—so a micro practice is typically only one of a series of stormwater controls. Micro practices include any feature that promotes stormwater infiltration, filtration or evapotranspiration: for example, small garden areas, tree grates, perimeter hedges and rain gardens.
- **Permeable pavements.** [Alternative pavers](#), [porous asphalt](#) and [permeable concrete](#) help reduce

stormwater flows by allowing water to infiltrate their porous surfaces and soak into the ground beneath. Alternative surfaces can often cost less than traditional storm drain systems and can replace existing impervious surfaces.

- **Infrastructure upgrades.** Redevelopment offers an opportunity to upgrade grey infrastructure like storm grates and pipes or reduce stormwater discharge by using green infrastructure.
- **Manufactured products.** A growing number of devices are coming on the market that provide a range of mitigation functions for stormwater management. These devices commonly work to separate large debris collected in stormwater, intercept sediments, promote infiltration or improve water quality. Examples include [hydrodynamic separators](#) and [catch basin inserts](#). They range in size, cost and maintenance needs, but are often appropriate for areas where space is limited.

Limitations

Redevelopment has certain policy and technical limitations. As a stormwater strategy, it can require larger regional cooperation. In growing rural districts, residents may not view a redevelopment strategy for established commercial as advantageous. For multi-jurisdictional regions, it will be important to clearly identify parties responsible for implementation and maintenance of stormwater controls during redevelopment activities.

From a technical perspective, site conditions (e.g., infiltration rates, groundwater conditions, stormwater hotspots) can also impose constraints. Since many urban buildings come with basements and underground garages, infiltration may not be an option if there is not enough distance between the stormwater control and the building. Also important are site-specific pollutants of concern: some stormwater controls are only effective at removing specific pollutants.

Effectiveness

Redevelopment is intended to reduce the quantity and improve the quality of stormwater leaving a site. Where new impervious surfaces simply replace existing impervious surfaces, water quality may not improve. However, reducing impervious surface or installing new

stormwater controls should decrease stormwater quantity and pollutants. The local construction plan review process should have a procedure in place for requiring and reviewing any redevelopment project's pre- and post-construction hydrology.

For examples of how five communities have used redevelopment to improve not only their stormwater management, but also their overall livability and economic viability, read these [Community Stories](#).

Additional Resources

Additional resources that provide a wealth of knowledge regarding redevelopment approaches, specific practices and success stories include:

- [The International Stormwater BMP Database](#)
- [EPA's green infrastructure site](#)
- [EPA's smart growth site](#)

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.