



Redevelopment Roundtable

Consensus Agreement

Smart Site Practices for Redevelopment and Infill Projects

October 2001

Center for Watershed Protection





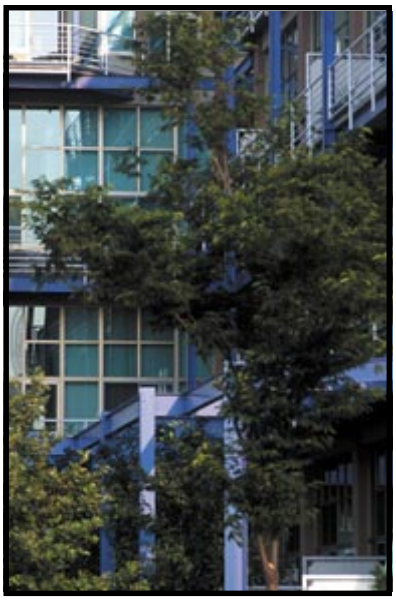

About the Center for Watershed Protection

Founded in 1992, the Center for Watershed Protection (CWP) is a non-membership, nonprofit 501(c)3 corporation dedicated to providing objective and scientifically sound information on effective tools and techniques for watershed planning, protection and restoration. CWP implements this mission in several ways, including providing technical assistance to federal and local governments as well as non-profits and other organizations.

For more information on the CWP and our current projects, visit our websites at www.cwp.org and www.stormwatercenter.net.

Introduction

While the U.S. is expected to grow by an additional ten million households over the next ten years, the proportion of people living in many of our city centers is actually declining. In fact, homeowner and rental vacancy rates are 20% higher in many city centers compared to their suburban counterparts (U.S. Census Bureau, 1999). This population shift leaves urban watershed managers with the challenge of protecting some areas from further development while at the same time restoring watersheds that are already severely impacted. Increasingly, urban redevelopment and infill projects are emerging as a means to help rejuvenate sagging city centers while simultaneously providing opportunities for more environmentally-friendly growth.



Canton Cove: *Baltimore, MD*
* Adaptive reuse project
* First water quality project on the Harbor
* Existing structure salvaged
* Original building footprint retained
* Garden courtyard used for stormwater management

Photo courtesy: Cho, Benn & Holback Architects

However, making redevelopment and infill projects a successful reality requires multiple stakeholders at various levels to evaluate the types of programs and practices necessary to help achieve various economic, environmental and social goals. From a development standpoint, the challenges of any particular project might require charting unknown territories, which can result in higher development costs. From an environmental perspective, the location of infill and redevelopment projects can further impact existing water resources. In addition, current building, zoning and other regulations need to be investigated, adapted, and integrated with issues of stormwater, water quality, air quality and habitat, along with the regulatory issues and politics of stormwater management and brownfields.

Municipal Parking Lot: *Prince George's County, MD*
* Previously untreated parking lot
* Redesigned to locate a bioretention facility

Recognizing that many interests need to be coordinated to promote Smart Growth, the Center for Watershed Protection convened the Redevelopment Roundtable, a group of national and local stakeholders who participated in a process to develop Smart Site Practices specifically for redevelopment and infill sites. This year-long process produced 11 practices to help reduce pollutants and improve the environmental quality of development sites in highly urban watersheds. Applied together, these practices have benefits for all local stakeholders, including developers, local government, community residents, and others who are interested in designing redevelopment and infill sites to better protect local streams, lakes, wetlands, and estuaries.

Potomac Yard: *Alexandria, VA*
* Redevelopment project
* Incorporates narrow sidewalks
* Incorporates small front setbacks
* Incorporates native vegetation
* Applies several stormwater management techniques

Photo courtesy: Larry Gavan

CWP Office Building: *Ellicott City, MD*
* Old filling station converted to a two-story office building
* Illustrates the efficient use of impervious cover

What Is the Redevelopment Roundtable?

The Redevelopment Roundtable represents a one-of-a-kind effort to engage a diverse spectrum of national and local stakeholders in a consensus process to address site level redevelopment and infill issues. The Roundtable was created to assure local communities that stakeholders in the redevelopment arena can agree on specific practices and programs that can help protect our existing natural resources and help build better communities. The Redevelopment Roundtable reached consensus on the 11 Smart Site Practices for Redevelopment and Infill.

What Are the 11 Smart Site Practices?

The term "Smart Site Practices" refers to site planning practices that can be used to mitigate watershed impacts in highly urban watersheds. Designed primarily with the developer in mind, the smart site practices represent the best techniques for protecting water quality and habitat in the highly constrained setting of urban infill and redevelopment. These practices are intended to complement municipal actions under the Smart Watersheds plan.

What Type of Redevelopment and Infill Projects Do Smart Site Practices Address?

The Redevelopment Roundtable recognizes that a vast array of redevelopment and infill projects exist. For the purposes of this project, redevelopment is defined as the process by which an existing developed area is adaptively reused, rehabilitated, restored, renovated and/or expanded. Infill, on the other hand, is development that occurs on smaller parcels that remain undeveloped but are within or very close to existing urban areas. In both cases, the development relies on existing infrastructure, and does not require an extension of water, sewer or other public utilities. In addition, the project must be located in a highly developed watershed, encouraged by the public sector, and water quality limited or biologically impaired. Example of redevelopment and infill projects are listed in the table below.

Various Types of Redevelopment and Infill Projects	
* Historic preservation	* Downtown business district
* Waterfront development	* Multifamily
* Brownfields	* Suburban commercial
* Residential infill	* Mixed use development
* Adaptive reuse	* Roadway expansion

How Can the Smart Site Practices Be Applied?

While the Smart Site Practices were developed primarily as a tool for designers, they can be used by developers, local government officials, planners, and environmentalists alike. For example, developers who are concerned about larger community environmental issues can refer to the Smart Site Practices for guidance on how their projects might be better designed to address watershed impacts. Local governments can utilize the Smart Site Practices to develop better criteria on which to gauge the potential impact of a development site. Lastly, communities can utilize the Smart Site Practices to gain insights on redevelopment and infill from a watershed protection perspective.

Barrister Court: *Baltimore, MD*
* Historic preservation project
* Used alternative pavers
* Parking lot transformed into a garden

Photo courtesy: Cho, Benn & Holback Architects

The Smart Site Practices

Practice #1: Redevelopment and infill planning should include environmental site assessments that protect existing natural resources and identify opportunities for restoration where feasible.

Rationale: Requirements under existing brownfields and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) legislation, as well as bank purchase and loan requirements, help to mitigate the impact of some pollution sites by requiring basic site history investigation and surface soil and water testing and cleanup. A more thorough environmental site assessment, which includes the production of a base map that outlines existing buildings, transportation networks, utilities, floodplains, wetlands, streams, and other natural features, can help address existing environmental constraints and highlight opportunities for restoration and reclamation at a site.

Practice #2: Sites should be designed to utilize impervious cover efficiently and to minimize stormwater runoff. Where possible, the amount of impervious cover should be reduced or kept the same. In situations where impervious cover does increase, sites should be designed to improve the quality of stormwater runoff at the site or in the local watershed.

Canton Square Development:
Baltimore, MD
* Previously undeveloped lot
* Townhouse development infill site
* Walking distance to transportation and amenities
* Centrally located park with natural area

Rationale: The amount of impervious cover is known to have a direct impact on annual runoff volume, and consequently affects annual pollutant loads, flooding frequency, stream channel degradation, and a host of other impacts. Some of these impacts can be mitigated by making efficient use of the existing impervious cover and reducing or keeping it the same when possible. Managing stormwater runoff can also help to reduce these impacts.

Practice #3: Plan and design sites to preserve naturally vegetated areas and to encourage revegetation, soil restoration and the utilization of native or non-invasive plants where feasible.

Rationale: Remaining natural areas have particular value in the urban environment, but are also strongly influenced by adjacent uses. Often found in small fragments, these areas can also suffer from poor quality soils, invasive plant species, dumping and extensive alteration by past development. Collecting and mapping natural features, working toward preserving these areas in a consolidated manner, and evaluating the site for potential stormwater management, revegetation, and passive recreational benefits can provide both environmental, economic and aesthetic benefits.

Practice #4: Establish mechanisms to guarantee long term management and maintenance of all vegetated areas.

Rationale: Guaranteed long-term management, financing and maintenance plans can assure continuous enjoyment and function of vegetated areas over the long run. Innovative partnerships, conservation easements, or donations to land trusts can help land owners ensure that intensively used vegetated areas on urban lands are actively kept up.

Practice #5: Manage rooftop runoff through storage, reuse, and/or redirection to pervious surfaces for stormwater management and other environmental benefits.

Rationale: Reducing the runoff generated from urban rooftops can reduce pollutant loads, flooding, channel erosion, and many other stream impacts. In addition, many rooftop runoff management practices can help conserve water and improve aesthetics. Examples of rooftop runoff management techniques include green rooftops, rooftop gardens, rain barrels and downspout disconnection. The design, slope and architecture of rooftops can reduce the volume of rooftop runoff as well.

26th Street Gateway: *Philadelphia, PA*
* Transformed post-industrial wasteland
* Preserved natural areas
* Planted native vegetation
Photo courtesy: Philadelphia Horticultural Society

Practice #6: Parking lots, especially surface lots, should be minimized and designed to reduce, store and treat stormwater runoff. Where site limitations or other constraints prevent full management of parking lot runoff, designers should target high use areas first.

Rationale: While adequate parking is often considered a critical ingredient to the success of most infill and redevelopment projects, parking lots are often one of the greatest sources of stormwater runoff. In addition, many older parking lots that are being redeveloped were designed with little regard to landscaping, actual parking demand, or effective stormwater treatment. Some of the techniques that can be utilized for managing parking lot runoff include making parking lots incrementally smaller, providing more functional landscaping, and where possible, treating the quality of stormwater runoff.

Practice #7: Utilize a combination of Better Site Design techniques with infill projects to minimize stormwater runoff and maximize vegetated areas.

Buckman Heights Apts.: Portland, OR
* Converted vacant parking lots to affordable rental apartments
* Rooftop runoff captured by courtyard
* Incorporates on-site stormwater management and native plants
* Walking distance to many amenities and public transportation

Photo courtesy: Prendergast & Associates

Rationale: Many single lot or small multi-lot infill projects contribute to "impervious creep," which is defined as the increase in impervious cover seen over time in highly developed areas. On-site improvements, such as house additions, expanded driveways, new housing, and sidewalks all contribute to impervious creep. Typically, there are few or no requirements to manage stormwater runoff or preserve or restore natural features associated with these small and incremental projects. Better Site Design refers to a design approach that seeks to reduce the amount of impervious cover associated with development, increase the natural lands set aside for conservation, use pervious areas for more effective stormwater treatment, and achieve a marketable, cost-effective product. Better Site Design consists of a series of benchmarks that fall under three categories: parking lot and street design, lot development, and natural areas conservation. Many of these benchmarks are applicable to infill development that can be described as: 1) single lot or small multi-lot infill (up to 3 lots) and 2) larger infill subdivisions (10 to 30 lots). While infill development occurs on smaller lot sizes (10,000 square feet or less), it is often still possible to effectively cluster lots to provide more open space and reduce impervious cover.

Practice #8: Utilize proper storage, handling and site design techniques to avoid the contact of pollutants with stormwater runoff.

Community Garden: Seattle, WA
* Features a garden irrigation system
* Fueled by rooftop runoff from a nearby daycare center

Rationale: Opportunities exist to improve water quality by preventing contact of rainfall with pollutant sources stored or handled at the site of redevelopment and infill projects. Controlling pollutants at the site (source control) is usually the simplest and most cost-effective way to reduce stormwater pollution at many commercial sites. Source control measures include: 1) proper handling and storage of pollutants and 2) site design practices. Handling and storage practices focus on the storage of materials and vehicles in outdoor areas, while site design practices include designing better loading docks, covering materials stored outdoors, and containing dumpsters and fueling areas. Other source control opportunities exist at fleet parking areas, outdoor maintenance areas, landscaping areas and above ground storage tanks.

Practice #9: Design the streetscape to minimize, capture and reuse stormwater runoff. Where possible, provide planting spaces to promote the growth of healthy street trees while capturing and treating stormwater runoff. In arid climates, xeriscapes should be used to achieve similar benefits.

Rationale: With proper design and consideration, the interface between the street, sidewalk and other structures, known as the streetscape, can provide opportunities to manage stormwater runoff while providing many other environmental and aesthetic benefits. For example, streets can be made more narrow, and landscaped areas and/or trees can be incorporated into the street front and created so that they function to treat stormwater runoff. In addition, when tree pits are provided along with adequate soil and rooting space, street trees can provide additional stormwater capture and other numerous environmental benefits. Alternatively, xeriscaping (the practice of landscaping to conserve water) can be an important tool in more arid climates.

Cottage Creek: Albany, OR
* Restored area stream with species survey
* Replaced exotic plans with native plants to restore habitat
* Converted a semi-wild urban lot to affordable senior housing

Photo courtesy: Glenn Rea Company

Practice #10: Design courtyards, plazas, and amenity open space to store, filter or treat rainfall.

Rationale: Much of the open space found in redevelopment and infill projects consists of hard surfaces that are impervious to rainfall. Using creative site plans, these courtyards, plazas, and other hard open spaces can be designed to store, filter and treat rainfall. Examples include the use of alternative pavers, bioretention areas, and planting boxes.

Village Weistoria: Bend, OR
* Urban infill development, single-family residential
* Preserved large public green spaces
* Features narrow streets and short setbacks
* Most amenities within walking distance

Photo courtesy: Village Development Corps.

Practice #11: Design sites to maximize transportation choices in order to reduce pollution and improve air and water quality.

Rationale: Designing redevelopment and infill sites to increase connections to adjacent land uses, parks and public spaces through non-automotive related transportation choices (bike paths, pedestrian walkways, etc.) can improve environmental quality. Sites should also seek to provide links to mass transit when available, and provide commuter amenities such as bus shelters or bike racks. In addition, site designers may also wish to explore alternate pathway options for pedestrian movement, rather than the traditional sidewalk on both sides of the street.

Consensus Statement

As members of the Redevelopment Roundtable, we acknowledge the Smart Site Practices as sound and practical redevelopment and infill techniques that can help maintain natural areas, reduce the effects of stormwater runoff, and protect local streams, lakes, wetlands and estuaries. We believe that the technical and case study information provided in these Smart Site Practices are based on sound research and encourage developers, environmental organizations, government agencies and the general public to utilize and promote the dissemination of the practices. The recommendations of the Redevelopment Roundtable reflect our professional and personal experience with redevelopment and infill and do not necessarily carry the endorsement of the organizations and agencies represented by their members.

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- Chris Swann, Watershed Planner
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Unless otherwise noted, photographs were contributed by Center staff.

Resources

Title: *Smart Site Practices: Designing More Environmentally Sensitive Redevelopment and Infill Projects*
By: Center for Watershed Protection, 2001
URL: www.cwp.org
This resource provides some of the detailed technical background and information behind the 11 Smart Site Practices.

Title: *About Brownfields*
By: EPA Office of Solid Waste and Emergency Response, Brownfields Program
URL: www.epa.gov/brownfields

Title: *Brownfields Redevelopment: A Guide for Local Governments and Communities*
By: International City/County Managers Association and Northeast Midwest Institute, 1997
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Title: *Exploring the Ecology of Greenroof Architecture*
By: Linda Velazquez, University of Georgia School of Environmental Design, 2000
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Title: *Financing Brownfields Redevelopment Projects– A Guide for Developers*
By: EPA Smart Growth Network, 2000
URL: www.smartgrowth.org/information/whatsnew.html

Title: *Parking Supply Management*
By: Federal Transit Administration
URL: www.fta.dot.gov/library/planning/tdmstatus/FTAPRKSP.HTM

Title: *Smart Growth: Building Better Places to Live, Work & Play*
By: National Association of Homebuilders, 2000
URL: www.nahb.org

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By: David O'Neill, Urban Land Institute, 2000
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Title: *Urban Parks Online*
By: LWRD Urban Parks Institute and Project for Public Spaces, 1997
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Title: *Smart Growth Network*
By: Network of stakeholders working to promote smart growth
URL: www.smartgrowth.org

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U.S. Bureau of the Census. 1999. website. www.census.gov.

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