WATER QUALITY SCORECARD

INCORPORATING GREEN INFRASTRUCTURE PRACTICES AT THE MUNICIPAL, NEIGHBORHOOD, AND SITE SCALES

INTRODUCTION

Communities are increasingly recognizing that the water quality impacts of development need to be managed at a variety of scales, including site level, neighborhood, and municipal[1] scales. Stormwater management is evolving beyond engineered solutions applied at the site level, such as basins and curb and gutter conveyance, to an approach that looks at managing stormwater at all three scales through natural processes. It is necessary to review all local codes and ordinances, at the three scales within the jurisdiction of a local government, to ensure that they are mutually supportive of water quality goals that address everything from larger land use decisions to specific site design criteria. The two main goals of this tool are to protect water quality by identifying ways to reduce the amount of stormwater flows in a community and to educate stakeholders on the wide range of policies and regulations that have water quality implications. Although this tool only addresses approaches under local control, municipalities need to communicate and cooperate through watershed-scale, inter-jurisdictional efforts in order to achieve local water quality goals.

Green infrastructure management approaches and technologies infiltrate, evapotranspire, capture and reuse stormwater to maintain or restore natural hydrologies. Green infrastructure encompasses a range of planning approaches and specific site design considerations that address stormwater management comprehensively and systematically. Linkages between sites and between practices within one site ensure that stormwater is slowed, infiltrated where possible and managed with consideration for natural hydrologic processes. Comprehensive stormwater management with green infrastructure must consider:

- Where to direct development in the community
- How to protect and preserve existing green infrastructure, and
- How to develop on individual sites

At the largest scale, the preservation and restoration of natural landscape features (such as forests, floodplains and wetlands) are critical components of green infrastructure. By choosing not to develop and thereby protecting these ecologically sensitive areas, communities can improve water quality while providing wildlife habitat and opportunities for outdoor recreation. At the intermediate neighborhood scale, green infrastructure planning includes street and road designs, thinking strategically about parking supply and considering urban tree goals. At the site scale, green infrastructure practices include rain gardens, porous pavements, green roofs, infiltration planters, trees and tree boxes, and rainwater harvesting for non-potable uses such as toilet flushing and landscape irrigation. These processes represent a new approach to stormwater management that is not only sustainable and environmentally friendly, but cost-effective as well. Many studies prove the cost-effectiveness of green infrastructure designs, in large part because of the avoided costs from reduced hard infrastructure such as pipes, ponds, and even street and sidewalk materials[2]. Moreover, municipalities are realizing that green infrastructure can be a single solution to the many and increasing challenges facing municipalities, including flood control, Clean

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[1] The term "municipality" is used by the International City/County Management Association (ICMA) and is meant to describe local government at both the city and county levels.
[2] U.S. EPA, 2007, *Reducing Stormwater Costs Through Low Impact Development (LID) Strategies and Practices*, Office of Wetlands, Oceans and Watersheds, USEPA, Washington, DC, December 2007, http://www.epa.gov/owow/nps/lid/costs07/; and Conservation Design Forum, Geomatics International, and Roth and Associates, 1999, *A Comparison of Sustainable and Traditional Landscapes*, http://www.cdfinc.com/images/download/Sustainable_Landscape_Cost_Comparison.pdf

Water Act requirements and basic asset management of publicly owned treatment systems. This tool helps identify the ways that green infrastructure addresses different agency goals to achieve multiple benefits.

More and more communities are implementing stormwater regulations that require or encourage the use of green infrastructure for managing stormwater on site. These cities and counties are finding that a review of many other local ordinances is necessary to remove barriers and ensure coordination across all development codes for better stormwater management and watershed protection. Local policies, such as landscaping and parking requirements or street design criteria, should complement strong stormwater standards and make it easier for developers to simultaneously meet multiple requirements. At the same time, if other local policies are written to support water quality goals, they can independently reduce and better manage stormwater runoff.

This policy audit can help municipal staff, stormwater managers, planners, and other stakeholders better understand where the opportunities and barriers may exist in a municipality's land development regulations and other ordinances when implementing a comprehensive green infrastructure approach. This tool assumes that the community has implemented a new or improved local stormwater ordinance requiring the use of green infrastructure practices to meet quantitative management standards. However, points are still given for a stormwater ordinance to ensure that local requirements are appropriately written and thoroughly enforced, maintained and tracked.

The worksheet provides direction for implementing a full range of regulatory and non-regulatory approaches that will support such a stormwater ordinance through a review of land use and development policies. However, the recommended tools include larger land use planning elements, land acquisition efforts and capital investment policies that should be undertaken by various municipal agencies to more fully institutionalize green infrastructure. In addition, there may internal agency policies and practices such as maintenance protocols or plan review processes that need to be altered as well.

The regulatory and non-regulatory approaches described in this scorecard may be under the control of a number of different local government agencies, including parks and recreation, public works, planning, environmental protection, utilities and transportation. This review process will require interagency coordination and cooperation to both identify and address the potential inconsistencies between different policies.

Each policy or approach is described in the context of its potential for providing water quality benefits, although most of the policies have many additional benefits for community livability, human health, air quality, energy demands, wildlife habitat and more. This tool is not intended to provide model ordinance language, but it does seek to emphasize best practices and provide municipalities with an understanding of the incremental steps for changing specific policies and larger internal policies and practices. For each policy or approach, the tool provides four categories of implementation methods:

1. Adopt plans
2. Remove barriers
3. Adopt incentives
4. Enact regulations

Each question in the tool will not necessarily feature all four implementation types, but may just call for one or some combination of the four. These implementation categories are meant to provide greater structure to the recommended changes, either based on the specific type of policy or approach or based on local factors that may require incremental changes and updates. Most recommendations avoid specific performance guidance so that the tool is useful to a range of municipalities in different contexts. However, municipal staff should use the case studies and resources provided to develop locally appropriate performance measures where possible.

To highlight the diverse nature of green infrastructure approaches, as well as the fact that control over these policies resides in various municipal agencies, the tool is divided into five sections, ranging from the municipal scale to neighborhood level designs and specific site considerations:

1. Protect Natural Resources (including trees) and Open Space (p. 6)
2. Promote Efficient, Compact Development Patterns and Infill (p. 16)
3. Design Complete, Smart Streets that Reduce Overall Imperviousness (p. 21)
4. Encourage Efficient Provision of Parking (p. 27)
5. Adopt Green Infrastructure Stormwater Management Provisions (p. 33)

Within each section, the scorecard seeks to ask questions that will allow the municipality to determine where, in the broad spectrum of policy implementation, their policies fall. The scorecard describes alternative policy or ordinance information that, when implemented, would support a comprehensive green infrastructure approach and increase a municipality's score. A policy score, based on a graduated point system, is provided for this purpose with a total of 252 points available.

INCORPORATING GREEN INFRASTRUCTURE PRACTICES AT THE MUNICIPAL, NEIGHBORHOOD, AND SITE SCALES SUMMARY		
	Policy Question	**Goals**
PROTECT NATURAL RESOURCES (INCLUDING TREES) AND OPEN SPACE		
	1A. Natural Resource Protection	
☐	1A. (1) Sensitive Lands/Critical Area Protection: Are development policies and incentives in place to protect natural resource areas and critical habitat?	Protect natural resource areas (e.g., forests, prairies) and critical habitat (e.g., conservation corridors, buffer zones, wildlife preserves) from future development.
☐	1A. (2) a. Protection of Water Bodies/Aquifers: Are no-development buffer zones and other protective tools in places around wetlands, riparian areas and flood plains that improve/protect water quality?	Protect critical areas such as wetlands, floodplains, lakes, rivers, and estuaries with a mandatory no-development buffer.
☐	1A. (2) b. Does the community have protection measures for source water protection areas through land use controls and stewardship activities?	Protect source water areas from current or potential sources of contamination.
	1B. Open Space Protection	
☐	1B. (1) Does the jurisdiction have adequate open space both in developed and greenfield areas of the community?	Create open networks throughout a community that serve a dual function of providing recreational areas and that are designed to assist in management of stormwater runoff.
	1C. Tree Preservation	
☐	1C. (1) Does the local government have a comprehensive public urban forestry program in place?	To protect and maintain trees on public property and rights-of-way and to plant additional trees to enhance the urban tree canopy.
☐	1C. (2) Has the community taken steps to protect trees on private property?	To preserve trees on private property and require replacement when removed or damaged during

		development.
☐	1C. (3) Are street trees encouraged or required as part of road and public right of way capital improvement projects?	Leverage existing capital funds to plant more street trees and add multiple benefits to the public right-of-way.

PROMOTE EFFICIENT, COMPACT DEVELOPMENT PATTERNS AND INFILL		
2A. Direct Development To Existing Infrastructure		
☐	2A. (1) Is growth directed to areas with existing infrastructure, such as sewer, water, and roads?	Policies, incentives, and regulations direct new development to areas that have existing infrastructure, such as water and sewer.
2B. Support Infill and Redevelopment		
☐	2B. (1) Are policy incentives in place to direct development to previously developed areas?	Municipalities implement a range of policies and tools to direct development to specific areas.
2C. Encourage Mixed-Use Developments		
☐	2C. (1) Are mixed use and transit-oriented developments allowed? Encouraged?	A municipality has codes and ordinances that allow for the "by right" building of mixed-use and transit-oriented developments.

DESIGN COMPLETE, SMART STREETS THAT REDUCE OVERALL IMPERVIOUSNESS		
3A. Street Design		
☐	3A. (1) Do local street design standards and engineering practices encourage streets to be no wider than is necessary to effectively move traffic?	Appropriate street widths allow narrower lanes for certain street types, thereby reducing overall imperviousness.
☐	3A. (2) Are shared driveways, reduced driveway widths, two-track driveways, and rear garages and alleys encouraged for all single-family developments?	Encourage alternative forms and decreased dimensions of residential driveways and parking areas.
3B. Green Infrastructure Elements and Street Design		
☐	3B. (1) Are major street projects required to integrate green infrastructure practices as a standard part of construction, maintenance, and improvement plans.	Formally integrate green infrastructure into standard roadway construction and retrofit practice.
☐	3B. (2) Do regulations and policies promote use of pervious materials for all paving areas, including alleys, streets, sidewalks, crosswalks, driveways and parking lots?	Build and retrofit these surfaces with pervious materials to reduce stormwater runoff and its negative impacts.

ENCOURAGE EFFICIENT PROVISION OF PARKING		
4A. Reduced Parking Requirements		
☐	4A. (1) Does your local government provide flexibility regarding alternative parking requirements (e.g., shared parking, off-site parking) and discouraged over-parking of developments? Do parking requirements vary by zone to reflect places where more trips are made on foot or by transit?	Match parking requirements to the level of demand and allow flexible arrangements to meet parking standards.
4B. Transportation Demand Management Alternatives		
☐	4B. (1) Are developers allowed to use alternative measures such as transportation demand management or in-lieu payments to reduce required parking?	Provide flexibility to reduce parking in exchange for specific actions that reduce parking demands on site.

	4C. Minimize Stormwater From Parking Lots	
☐	4C. (1) Are there requirements for landscaping designed to minimize stormwater in parking lots?	All parking lots feature substantial landscaping to help reduce runoff.
ADOPT GREEN INFRASTRUCTURE STORMWATER MANAGEMENT PROVISIONS		
	5A. Green Infrastructure Practices	
☐	5A. (1) Are green infrastructure practices encouraged as legal and preferred for managing stormwater runoff?	All types of green infrastructure are allowed and legal. Local government has removed all impediments to using green infrastructure (including for stormwater requirements), such as limits on infiltration in right-of-ways, permit challenges for green roofs, concerns about mosquitoes in rain barrels, safety issues with permeable pavements, and other such unnecessary barriers.
☐	5A. (2) Do stormwater management plan reviews take place early in the development review process?	Local governments incorporate stormwater plan comments and review into the early stages of development review/site plan review and approval, preferably at pre-application meetings with developers.
☐	5A. (3) Do local building and plumbing codes allow harvested rain water for non-potable interior uses such as toilet flushing?	Ensure that stormwater reuse is allowed and encouraged for non-potable uses.
☐	5A. (4) Are provisions available to meet stormwater requirements in other ways, such as off-site management within the same sewershed or payment-in-lieu of programs, to the extent that on site alternatives are not technically feasible?	Allow off-site management of runoff while still holding developers responsible for meeting stormwater management goals.
	5B. Maintenance/Enforcement	
☐	5B. (1) Does your stormwater ordinance include monitoring, tracking, and maintenance requirements for stormwater management practices?	Incorporate monitoring, tracking, and maintenance requirements for stormwater management practices into your municipal stormwater ordinance.

HOW TO USE THE SCORECARD

This scorecard is not meant to be a certification or comparative tool, but rather a locally controlled self-assessment and guide for better incorporating green infrastructure practices at the municipal, neighborhood, and site scales. While the tool could be completed by one department or agency, the effectiveness of this tool will increase if an interagency process is established to review all local codes and policies that might impact water quality. The suggested first step in using this tool is to convene appropriate staff to review various sections of the tool and work together to ensure that updates and changes to codes, policies and internal processes align well with other agency changes. To help facilitate cross-agency conversation, at the end of each of section there is a place for the reader/reviewer to sign-off that they have reviewed a particular section. These signature lines are not required but are provided to encourage an open process for improving programs and policies across the full five sections of the tool.

A NOTE ABOUT THE POINT SYSTEM

The point system is included so that the tool can be more than just a resource, e.g., serve as a measure for local program evaluation and improvement. Communities can determine their score based on existing programs and policies and then set goals from this baseline. Local targets may include incremental yearly improvements or achieving additional points in a particular section, such as parking or natural resources and open space. Decisions about whether or not to use the point system at all should be made at the local level. If the point system is used, municipalities can set locally appropriate thresholds and goals.

All communities will not be able to receive each and every point. The tool is nationally applicable and is intended for use by a range of community types and sizes in locations throughout the U.S. As a result, some questions and points will only be available to urban municipalities while others will only be available to those in a more suburban or rural setting.

1.	PROTECT NATURAL RESOURCES (INCLUDING TREES) AND OPEN SPACE			
1.A—Natural Resource Protection	**Implementation Tools and Policies**	**Points Available**	**Points Received or N/A**	**Notes and Local References**
(1) Sensitive Natural Lands/Critical Area Protection **Question:** Are development policies, incentives, regulations, and incentives in place to protect sensitive natural lands and critical wildlife habitat? **Goal:** Protect natural resource areas (e.g., forests, steep slope areas, and critical wildlife habitat) from future development. **Why:** Protection of significant tracts of critical lands and wildlife habitat will aid in protecting and improving water quality by increasing infiltration and groundwater recharge, preventing erosion and contamination of ground water and surface water resources, and protecting sources of drinking water.	**Adopt Plans/Educate:** • The local government has identified and mapped critical natural resource areas (e.g., steep slopes, wildlife habitat, forests, drinking water source areas). See Lenexa, Kansas. • The local comprehensive plan contains a natural resource protection element with goals calling for preservation of identified critical natural resource areas. See Baltimore County, Maryland. • Key natural resource areas are identified for protection in jurisdiction's parks and open space plan. • The local government provides assistance to landowners in identifying sensitive natural areas and laying out developments to avoid such areas. • Local plans establish and enforce areas which are available for development and which lands are a priority for preservation.	**1** **1** **1** **1** **1**		
	Remove Barriers: • Protection of sensitive natural areas and wildlife habitat qualifies for credit towards local open space dedication and set-aside requirements.	**1**		

	Adopt Incentives:			
	• The local government financially supports or partners with land trusts to acquire critical natural areas.	**1**		
	• The community has a dedicated source of funding for open space acquisition and management (e.g., bond proceeds, sales tax, etc.).	**2**		
	• The locality has adopted a transferable developments rights program to provide an incentive for landowners to preserve sensitive natural lands and wildlife habitat.	**1**		
	• Land use regulations provide for the creation of cluster and conservation subdivision on the periphery of urban growth areas to encourage preservation of intact blocks of sensitive natural areas.	**1**		
	Enact Regulations:			
	• The locality has adopted regulations to protect steep slope, hillsides, and other sensitive natural lands (e.g., by limiting development on slopes > 30% or requiring larger lot sizes in sensitive areas).	**2**		
	• The locality has adopted wildlife habitat protection regulations aimed at preserving large contiguous blocks of habitat areas.	**2**		
	• Agriculture/natural resource zoning districts (e.g., minimum lot size of 80 acres and larger) have been created to preserve agricultural areas and forests.	**2**		
(2) Protection Of Water Bodies/Aquifers	**Adopt Plans/Educate:**			
	• The local government has identified and mapped critical	**1**		

a. Question: Are no-development buffer zones and other protective tools in places around wetlands, riparian areas, and flood plains that improve/protect water quality? Goal: Protect critical areas such as wetlands, floodplains, lakes, rivers, and estuaries with a mandatory no-development buffer. Why: This will limit pollutant loads and hydrologic alterations to water bodies.	water resource areas. • The local comprehensive plan contains a water quality protection element with goals calling for protection of identified water bodies and other water resource areas such as wetlands. • Key critical water resource areas are identified for protection in jurisdiction's parks and open space plan. • The local government has cooperated in developing regional approaches to watershed protection and stormwater management.	1 1 1		
	Remove Barriers: • Wetlands and other water bodies and buffer areas qualify for credit against local open space dedication/set-aside regulations.	1		
	Adopt Incentives: • Protected water bodies and buffer areas qualify for 2X (or more) credit against open space requirements set by the municipality. • Restoration of degraded riparian/wetland areas qualifies for additional open space credit within the local municipal system. • Density from protected riparian areas/buffers can be transferred to upland portion of development sites.	1 1 1		

	Enact Regulations:			

	• Riparian and wetland buffer areas required by local land use regulations
	    --Buffer is at least 50 feet (as measured from the top of bank) = 1 point
	    --Buffer is at least 100 feet (as measured from the top of bank) = 2 points
	    --Buffer is greater than 100 feet (as measured from the top of bank) = 3 points
	(See Maryland[3] and Wisconsin[4] examples).
		1 to 3 points		

	• Critical water resource areas cannot be counted in calculating allowable density on a site (e.g., on a 200-acre site with 50 acres of wetlands, only 150 acres can be used to calculate density under zone district regulations, and only those 150 acres may be developed.)	**1**		
	• All development in floodplains is prohibited or must demonstrate no adverse impacts upstream and downstream (See Association of State Floodplain Managers for details on "adverse impact" approach to floodplain management.).	**2**		
	• Locality adopts stormwater quality and quantity performance standards for development sites (e.g., restrictions on sedimentation levels, pre/post development flows).	**1**		
	• Regulations require restoration of degraded riparian/wetland areas on a development site.	**1**		
	• Damage to riparian/wetland areas must be compensated for on a minimum 2:1 basis on- or off-site.	**1**		
	• Establish and actively enforce a performance standard for stormwater discharges to wetlands that protect the	**1**		

[3] Riparian Forest Design, Establishment and Maintenance; Maryland Cooperative Extension Service, http://www.riparianbuffers.umd.edu/fact/FS725.html
[4] US Department of Agriculture, Natural Resources Conservation Service, Solution: Riparian Buffers,

	hydrologic regimes and limit pollutant loads.			
b. Question: Does the community have protection measures for source water protection areas through land use controls and stewardship activities? **Goal:** Protect source water areas from current or potential sources of contamination. **Why:** This will safeguard community health, reduce the risk of water supply contamination, and potentially reduce water treatment costs.	**Adopt Plans/Educate:** • Local land use plans identify aquifer recharge/source water areas and recommend protective measures. • All stormwater inlets required to carry a notice regarding receiving waters. • Wellhead and aquifer recharge have been mapped and published to alert developers to potential restrictions.	**1** **1** **1**		
	Remove Barriers:			
	Adopt Incentives: • Drinking water source protection and aquifer recharge areas have been identified and a dedicated funding source is in place to purchase and protect such areas. • Protection of critical water source areas qualifies for additional credit towards local open space requirements.	**1** **1**		
	Enact Regulations: • Well-head protection regulations/zones are adopted to prevent incompatible development and uses. • Aquifer protection regulations/zones are adopted to prevent incompatible development and uses.	**1** **2**		

1.B-- Open Space Protection	Implementation Tools and Policies	Points Available	Points Received or N/A	Notes and Local References
(1) Question: Does the jurisdiction have adequate open space both in developed and greenfield areas of the community? **Goal:** Create open networks throughout a community that serve a dual function of providing recreational areas and that are designed to assist in management of stormwater runoff. **Why:** In addition to providing open space throughout a community as an amenity, such a network can provide large areas that contribute little to stormwater loads and can provide large areas for the infiltration and purification of stormwater.	**Adopt Plans/Educate:** • The local government has adopted a community wide open space and parks plan. • The local comprehensive plan contains an open space/parks element that recognizes the role of open space in sustainable stormwater management.	**1** **1**		
	Remove Barriers: • Allow green infrastructure practices to be counted towards local open space set aside requirements up to 50% of total.	**1**		
	Create Incentives: • Grant additional open space credit for green stormwater management facilities that are improved/designed for public recreational purposes. • Provide credit against open space impact fees for green roofs. Reference to Chicago program.	**1** **1**		

	Enact Regulations:	1		
	• The municipality has neighborhood policies and ordinances that work to create neighborhood—not development site—open space amenities that are within ¼ to ½ mile walking distance from residences. Davidson, North Carolina, for example, requires a public park within a five minute walk of all housing units.[5]	1		
	• Adopt an open space impact fee that is used to purchase passive open space that can assist in stormwater management.	1		
	• The local government has adopted open space dedication and/or set aside requirements based on the demand generated by the development. As a baseline, use the average open space requirements adopted by the National Parks and Recreation Assn. (e.g., 10 acres of community and neighborhood parks for every 1,000 persons in a development or fraction thereof.	1		
1.C--Tree Protection	**Implementation Tools and Policies**	**Points Available**	**Points Received or N/A**	**Notes and Local References**
(1) Question: Does the local government have a comprehensive public urban forestry program in place? **Goal:** To protect and maintain trees on public property and rights-of-way and to plant additional trees to enhance the urban tree canopy.	**Adopt Plans/Educate:** • Survey and inventory existing trees on public lands and street rights-of-way. Document the characteristics and location of street trees and urban tree canopy to inform public tree planting, adoption, and maintenance programs.	1		
	• Select public tree species based on known performance for managing stormwater runoff. Publish list and make	1		

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[5] Open space systems are typically meant to be multi-functional, thereby when reasonable accommodating recreational functions.

Why: Mature trees provide multiple community benefits, including reducing overall stormwater runoff and improving stormwater quality.	widely available for homeowners/others that plant street trees.		
	• Conduct education and outreach about tree protection, proper maintenance and replanting opportunities through printed materials, workshops, events and signage.	**1**	
	• Adopt a policy to protect existing trees on local government development sites (e.g., municipal parking lots, municipal buildings, etc.).	**1**	
	• Community maintains an active tree maintenance program for public trees, including pest control, pruning, watering , and similar measures.	**1**	
	Remove Barriers:		
	• Acknowledge trees as part of community infrastructure and develop a coordinated design for locating public utilities to provide enough space for mature tree canopy and root development.	**1**	
	Adopt Incentives:		
	• Provide free or reduced-price trees to homeowners to be used as street trees.	**1**	
	Enact Regulations:		
	• Require any public trees removed or damaged during construction associated with private development to be replaced on- or off-site with an equivalent amount of tree caliper. (e.g., remove a 24-diameter tree/replace with 6 four-inch diameter trees.	**1**	
	• Adopt construction protection rules for all public trees (e.g., fencing, no storage of hazardous materials, avoid cutting into root zones, etc.).	**1**	

(2) Question: Has the community taken steps to protect trees on private property? **Goal**: To preserve trees on private property and require replacement when removed or damaged during development. **Why**: Mature trees provide multiple environmental, economic, and community benefits, including improved water and air quality, reduced heat island effects, lowered energy costs, and improved community aesthetics.	**Adopt Plans/Educate:** • Community plans specifically include tree preservation and replacement as a community goal. • The local government conducts educational sessions for builders and developers regarding appropriate tree protection techniques (e.g., Chapel Hill, NC) and/or publishes a technical protection manual (See Florida Dept. of Agriculture tree protection manual.)[6] • Municipality follows maintenance and inspection timelines and meets canopy goals and milestones by ensuring old trees survive, replacing dead or diseased trees, and planting new trees.	**1** **1** **1**		
	Remove Barriers: • Set up maintenance and inspection agreements for private properties meeting stormwater requirements or receiving stormwater fee credit for trees. • Set up long-term maintenance and inspection schedules for trees on public lands.	**1** **1**		
	Adopt Incentives: • The local government supports local non-profits that plant trees and provide educational services. • A tree fund has been established to receive in-lieu	**1** **1**		

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[6] This can be the foundation of a certification program for local users.

	payments when trees must be removed from a development site to accommodate permitted projects.			
	• Trees of a specified minimum size count towards a percentage of stormwater management requirements (e.g., partial credit given for each mature tree exceeding a specified height or canopy size).	**1**		

	• Trees over a specified minimum size (e.g., 3-inch caliper) protected during development are credited towards landscaping requirements.
	  -- meeting the established landscape requirement = 1 point
	  --exceeding the established landscape requirement = 2 points
		1 to 2 points		

	Enact Regulations: • Require permits before removing trees on proposed development sites.	**1**		
	• Set minimum preservation standards for new development sites.	**1**		
	• Require site plans or stormwater plans to include tree preservation.	**1**		
	• Require/allow tree replacement off-site for infill sites.	**1**		
(3) Question: Are street trees encouraged or required as part of road and public right of way capital improvement projects? **Goal**: Leverage existing capital funds to plant more street trees and add multiple benefits to the public right-of-way.	**Adopt Plans/Educate:** • Local comprehensive and transportation plans support the planting of street trees by all private and public development projects.	**1**		
	• Capital improvement plans include tree planning as part of project budgets.	**1**		

Why: Street trees can help manage and reduce stormwater runoff while proving multiple public and environmental benefits.	**Remove Barriers:**			
	Adopt Incentives:			
	• Incentives, such as reduced setbacks or increased building densities, are offered in exchange for additional tree preservation beyond ordinance requirements.	**1**		
	Enact Regulations:			
	• All private and public developments are required to plant street trees in accordance with size, spacing, and other local government requirements. Street tree selection relates tree size to street width (traffic volumes) so that streets with wider streets contain larger trees.	**1**		
	• New street designs and redesigns of existing streets take into account space for tree development and require 10-foot minimum area above and below ground (this includes lateral root growth as well as direct downward growth to accommodate mature tree canopy and roots without adversely affecting other utilities.	**1**		
	• Local government street specifications require permeable paving for sidewalks and other surfaces to reduce stormwater runoff and allow street trees to benefit from the available water.	**1**		
Total score for PROTECT NATURAL RESOURCE AREAS AND OPEN SPACE :		**80**		

This section has been reviewed and scored by _____ **(Insert Department name and signee)**

Resources

- http://www.elistore.org/reports_detail.asp?ID=11272
- Center for Watershed Protection guidance on aquatic buffers: http://www.cwp.org/aquatic_buffers.htm
- http://www.rivercenter.uga.edu/publications/pdf/riparian_buffer_guidebook.pdf
- http://www.longislandsoundstudy.net/riparian/legal.htm
- U.S. EPA Sourcewater Protection: http://www.epa.gov/nps/ordinance/sourcewater.htm
- Duerksen and Snyder, *Nature-Friendly Communities: Habitat Protection and Land Use Planning*, (Island Press 2005).
- City Trees: Sustainability Guidelines and Best Practices, http://www.treetrust.org/pdfs/citytrees-bonestroopilot.pdf
- American Forests Guide to Setting Urban Tree Canopy Goals: http://www.americanforests.org/resources/urbanforests/treedeficit.php
- CWP Urban Forestry Manual: http://www.cwp.org/forestry/part3forestrymanual.pdf (pg. 69))
- Duerksen and Richman, *Tree Conservation Ordinances,* American Planning Assn. PAS Report No. 446 (1993)
- Zoning Practice: Tree Preservation (American Planning Assn. July 2006)
- Trees for green streets: An illustrated guide: http://www.metro-region.org/index.cfm/go/by.web/id=26337
- Portland, OR Tree Preservation Information Guide: http://www.sustainableportland.org/shared/cfm/image.cfm?id=72545
- EPA SWPPP Guide: http://cfpub.epa.gov/npdes/stormwater/swppp.cfm
- Research by Dr. Qingfu Xiao, UC Davis, (qxiao@ucdavis.edu) indicates that a 4 x 4 ft tree well with engineered soil can retain 150 gal of runoff during a large event, while the tree crown can intercept about 50 gallons.
- Plants for Stormwater Design Volume II, http://www.greatrivergreening.org/_downloads/PSD%20II%20Sample.PDF

Case Studies

- Alachua County, FL land acquisition policies: http://www.alachuacounty.us/government/depts/epd/land/filesforms.aspx
- King County, WA's Greenprint Project open space and land acquisition strategy: http://dnr.metrokc.gov/wlr/greenprint/about.htm
- San Jose, CA tree credit for post-construction stormwater treatment: http://www.sanjoseca.gov/planning/stormwater/Policy_6-29_Memo_Revisions.pdf
- Portland, OR stormwater fee discounts for trees over 15 feet tall: http://www.portlandonline.com/bes/index.cfm?c=43444&#types
- Portland, OR tree credit for meeting local stormwater requirements: http://www.portlandonline.com/shared/cfm/image.cfm?id=93075
- New York City's street tree planting amendment: http://www.nyc.gov/html/dcp/html/street_tree_planting/index.shtml
- Charlottesville, NC Comprehensive Plan –Chapter 8, Urban Forest Goals: http://www.charlottesville.org/Index.aspx?page=1745 (pg. 184-187)

2.	PROMOTE EFFICIENT, COMPACT DEVELOPMENT PATTERNS AND INFILL			
2.A— Direct Development To Existing Infrastructure	**Implementation Tools and Policies**	**Points Available**	**Points Received or N/A**	**Notes and Local References**
(1) Question: Is growth directed to areas with existing infrastructure, such as sewer, water, and roads? **Goal**: Policies, incentives, and regulations direct new development to areas that have existing infrastructure, such as water and sewer. However, in situations where development is sited in areas with no sewer infrastructure, permitting alternative treatment options that can allow for higher density development or clustering of houses will reduce the overall WQ impact. **Why**: Sewer and water authorities can play a major role in directing a region's growth by determining when and where new infrastructure investment will occur. Well-drafted facility planning areas can direct growth by providing sewer service in areas least likely to impact water resources.	**Adopt Plans/Educate:** • Local plans recommend/establish urban growth areas and urban growth boundaries. Development is encouraged within urban growth boundaries and discouraged outside of it. • Local government has analyzed which areas within the jurisdiction are appropriate for higher density development based on existing infrastructure capacity, cost of providing new services, and access. • Capital improvement plans for public infrastructure (roads, water, sewer, etc.) target funding inside urban growth boundary. • Local sewer/water authority capital improvement plans follow development policies established in local comprehensive plans and target areas with existing development/infrastructure.	1 2 2 1		
	Remove Barriers: • Development standards addressing landscaping, buffering, parking, and open space are tailored for infill areas to avoid creating unnecessary hurdles to development (e.g., imposing suburban parking requirements in high-density infill areas). • Remove prohibitions on accessory dwelling units in infill areas to increase density of development.	2 2		

	• Off-site, regional water retention/detention encouraged/allowed to avoid costly on-site retention in densely developed infill areas and to provide benefit to priority retrofit sites, such as schools.	**2**		
	• Package plants and other treatment trains[7] are encouraged for development in limited circumstance areas where growth is appropriate but sewers/treatment capacity do not exist.	**1**		
	• Technical information and analysis on the effectiveness of various treatment systems are readily available to developers. Local governments have completed the research and have determined which systems work best for their soil conditions and topography and have made this information available to the development community.	**1**		
	• Allow a wide variety of housing types and sizes within infill areas and reduced minimum lot sizes.	**1**		
	Adopt Incentives: • Increase development densities and allowable height in infill areas.	**1**		
	• Reduce impact fees for infill development based on less demand for new infrastructure.	**1**		
	• Create development incentives for green roofs (e.g., increased FAR bonus, additional building height, etc.)	**1**		
	• Include provision in stormwater management requirement that reduces on site management requirements for projects that decrease total imperviousness on previously developed sites.	**1**		

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[7] Concept 1: A set of source control best management practices (BMPs), possibly followed by a treatment devices, Concept 2: A series of separate treatment devices or "boxes"

	Enact Regulations:	Points Available		
	• Zoning and land development regulations implement urban service areas/urban growth boundary policies by restricting development in outlying areas.	1		
	• Adopt adequate public facility and concurrency ordinances that require adequate public infrastructure to be available when development comes on line (e.g., water, sewer, roads).	1		
	• Adopt large-lot/agricultural zoning (e.g., 1 unit/160 acres) on fringe of city to restrict inappropriate greenfield development.	1		
	• Enact transitional compatibility standards to ensure that new denser infill development is compatible with existing neighborhoods/adjacent development.	1		
2.B—Support Infill and Redevelopment	**Implementation Tools and Policies**	**Points Available**	**Points Received or N/A**	**Notes and Local References**
(1) Question: Are policy incentives in place to direct development to previously developed areas? **Goal:** Municipalities implement a range of policies and tools to direct development to specific areas. **Why**: Municipalities can realize a significant reduction in regional runoff if they take advantage of underused properties, such as infill, brownfield, or greyfield sites. Redeveloping already degraded sites such as abandoned shopping	**Adopt Plans/Educate:** • Local plans identify potential brownfield sites and support their redevelopment. • Capital improvement plans include infrastructure improvements (water, sewer, road, sidewalk, etc. upgrades) for identified brownfield sites. • Educate lending and financial institutions about benefits and local priorities of directing development to existing areas. • Conduct outreach to the community to ensure local form and pattern of development are supported.	1 1 1 1		

centers or underutilized parking lots rather than paving greenfield sites for new development can dramatically reduce total impervious area while allowing communities to experience the benefits and opportunities associated with growth.	Implementation Tools and Policies	Points Available	Points Received or N/A	Notes and Local References
	Remove Barriers: • Municipality should establish a brownfields program to remove uncertainty regarding clean-up and liability issues.	**1**		
	Adopt Incentives: • The local government provides incentives such as density bonuses and accelerated permitting for brownfield sites. • Local government adopts funding mechanisms for remediating/redeveloping brownfield sites. • Streamlined permitting procedures are put into place for infill and brownfield redevelopment plan review. • Establish TIF districts to encourage redevelopment.	**1** **1** **1** **1**		
	Enact Regulations: • In local codes, ordinances, and policies, the municipality differentiates between greenfield and infill development.	**1**		
2.C—Encourage Mixed-Use Developments	**Implementation Tools and Policies**	**Points Available**	**Points Received or N/A**	**Notes and Local References**

(1) Question: Are mixed use and transit-oriented developments allowed? Encouraged? **Goal**: A municipality has codes and ordinances that allow for the "by right" building of mixed-use and transit-oriented developments. **Why**: Mixed use developments allow for the co-locating of land uses, which decreases impervious surfaces associated with parking and also decreases vehicle miles traveled—resulting in a reduction of hydrocarbons left on roadways and reduced air deposition. Transit oriented development (TOD) produces water quality benefits by reducing: (1) land consumption due to smaller site footprints; (2) parking spaces and the impervious cover associated with them; and (3) average vehicle miles traveled, which, in turn, reduces deposition of air pollution into water bodies.	**Adopt Plans/Educate:** • Comprehensive plans identify appropriate areas for higher-density mixed-use developments (e.g., at transit stops) and recommend policies to encourage their development. • Local capital improvement plans and funding are targeted to areas appropriate for mixed-use development.	**1** **2**	
	Remove Barriers: • Zoning ordinances are amended to create by-right mixed-use and transit-oriented development districts or overlays. • Local government initiates map amendments to designate mixed-use and transit-oriented development areas, eliminating the need for developers to secure zoning amendments.	**1** **1**	
	Adopt Incentives: • Parking requirements are reduced to reflect decreased automobile use. • Credit given for adjacent on-street parking, which can count for local parking requirements. • Shared parking and alternative parking arrangements encouraged. • Mixed-use districts/areas feature increased densities and height. • Accessory parking structures are not counted against maximum FAR on a site.	**1** **1** **1** **1** **1**	

	Enact Regulations:		
	• Zoning code requires a minimum mix of uses and minimum density in designated mixed-use and transit-oriented development areas.	1	
	• Auto-oriented uses and drive-throughs restricted or prohibited in mixed-use and transit-oriented development areas.	1	
Total score for PROMOTE EFFICIENT, COMPACT DEVELOPMENT PATTERNS AND INFILL:		45	

This section has been reviewed and scored by _____ **(Insert Department name and signee)**

Resources
- Directing development to already degraded land (1A): http://www.mdp.state.md.us/fundingact.htm
- Directing development to areas with existing infrastructure (1B): http://www.metro-region.org/index.cfm/go/by.web/id/277
- EPA Smart Growth Office's Protecting Water Resources with Higher-Density Development: http://www.epa.gov/dced/water_density.htm
- Smart Growth Toolkit, Smart Growth Leadership Institute, http://www.smartgrowthtoolkit.net/main-content/the-smart-growth-implementation-tools.html

Case studies
- State of WI planned sewer services areas: http://dnr.wi.gov/org/water/wm/GLWSP/SSAPlan/
- http://www.10000friends.org/growth/water/

3.	DESIGN COMPLETE, SMART STREETS THAT REDUCE OVERALL IMPERVIOUSNESS			
3.A—Street Design	**Implementation Tools and Policies**	**Points Available**	**Points Received or N/A**	**Notes and Local References**
(1) Question: Do local street design standards and engineering practices encourage streets to be no wider than necessary to effectively move traffic? Do street designs vary according to: *street type* (arterial streets, collector streets, neighborhood streets) and *urban context* (urban core, transit station area, suburban center, general suburban, rural)? Do policies allow narrow neighborhood streets designed to slow traffic and create safer conditions for pedestrians and bicyclists? **Goal**: Appropriate street widths allow narrower lanes for certain street types, thereby reducing overall imperviousness. **Why:** The width of travel lanes, parking lanes and sidewalks should be tailored to the urban setting. Where appropriate, narrowing travel lane width to 10-11 ft, rather	**Adopt Plans/Educate:** • Comprehensive plan/transportation plan emphasizes alternative modes of transportation (ped, bike, transit) to reduce vehicle miles traveled and width and prominence of roads/streets. • Comprehensive/transportation plan calls for distributing traffic across several parallel streets, reducing the need for high capacity streets with wide rights-of-way. • Comprehensive/transportation planning process brings emergency response and other local government departments (e.g., public works, utilities) to the table early in the process to discuss street design. • Local government adopts formal bicycle/pedestrian master plan. • Create "safe routes to school" programs or other pedestrian/bike safety initiatives. • Municipality continually seeks to improve walking/biking conditions or has a formal bicycle/pedestrian master plan.	1 1 1 1 1 1		
	Remove Barriers: • Comprehensive plan endorses context-sensitive street design with narrower streets in appropriate locations. • Improve pedestrian crossing at intersections to	1 1		

than the standard 12-13 ft, can significantly reduce the total amount of impervious surfaces. Such streets can also substantially improve conditions for walking, biking, and using transit, which reduces automobile use and overall demand for parking spaces.	encourage walking.			
	• Consolidate utilities in street ROW to improve sidewalk design and function.	**1**		
	• Negotiate with state DOT or county transportation department to allow different design standards for regional roads passing through downtowns or other key areas.	**1**		
	• Promote street standards for fire safety that include attributes of narrow streets (20 feet widths) while identifying factors relevant to local government departments involved with streets such as public works, engineering and utilities.	**2**		
	• Municipality takes formal control of state or county roads within city boundaries to ensure power over design and operations.	**2**		
	Adopt Incentives:			
	• Developments that provide comprehensive pedestrian/bicycle circulation systems allowed to reduce number of vehicle parking spaces. (See parking section below for greater detail.)	**1**		
	• Developments with approved comprehensive mobility/transportation plans allowed to building narrower, less costly streets and alleys.	**1**		

	Enact Regulations:			
	• Revamp local government technical street specifications to allow context-sensitive, innovative street design with narrower travel lanes, without curb and gutter, etc. in appropriate circumstances (See ITE Recommended Practice document below).	**2**		
	• Design standards for narrower neighborhood streets have been endorsed/adopted by emergency response professionals and other local government departments involved with streets such as public works, engineering, and utilities.	**1**		
	• Local government development review process involves emergency response early on to reach consensus on appropriate project street design and access.	**1**		
	• Development review process requires submittal of project pedestrian/bicycle circulation plans with safe street routes and other ped/bicycle-friendly features in addition to traffic circulation plans for larger developments.	**1**		
	• Local government applies formal connectivity index[8] or other measures to ensure adequate internal street and pedestrian/bicycle connections.	**2**		
	• Zoning/subdivision regulations require minimum number of connections between new project and surrounding developments and neighborhoods.	**2**		

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[8] Connectivity index refers to the directness of links and the density of connections in path or road network. A well-connected road or path network has many short links, numerous intersections, and minimal dead-ends (cul-de-sacs). As connectivity increases, travel distances decrease and route options increase, allowing more direct travel between destinations, creating a more Accessible and Resilient system. Source: Online Travel Demand Management Encyclopedia, http://www.vtpi.org/tdm/tdm116.htm

(2) Question: Are shared driveways, reduced driveway widths, two-track driveways, and rear garages and alleys encouraged for all single-family developments? **Goal:** Encourage alternative forms and decreased dimensions of residential driveways and parking areas. **Why:** Off-street parking and driveways contribute significantly to the impervious areas on a residential lot. Reducing such dimensions can minimize the amount of stormwater runoff from a site.	**Adopt Plans/Educate:**			
	Remove Barriers: • Developments that utilize shared driveways and rear-loaded garages to reduce impervious cover allowed to permit overnight parking in driveways and on-street. • Development code prohibits homeowner covenants forbidding overnight parking in driveways, on-street overnight parking and shared driveways.	**1** **1**		
	Adopt Incentives: • Developments with narrow driveways and rear-loaded garages allowed to reduce number of parking spaces for guests. Zoning/subdivision regulations require minimum number of connections between new project and surrounding developments and neighborhoods.	**1** **1**		

	Enact Regulations:			
	• Shared driveways are permitted or required for single-family residential developments.	**1**		
	• Minimum widths for single-family driveways reduced to 9 feet.	**1**		
	• Two-track driveways allowed by technical street/subdivision specifications.	**1**		
	• Single-family residential developments encouraged/required to be designed with minimum percentage of alley-accessible, rear-loading garages. **--**Alleys/garages encouraged = 1 points --Alleys/garages required = 2 points	**1 to 2 points**		
3.B—Green Infrastructure Elements and Street Design	**Implementation Tools and Policies**	**Points Available**	**Points Received or N/A**	**Notes and Local References**
(1) Question: Are major street projects required to integrate green infrastructure practices as a standard part of construction, maintenance, and improvement plans. **Goal:** Formally integrate green infrastructure into standard roadway construction and retrofit practice. **Why:** Consistent projects to improve or repair streets provide opportunities to include green infrastructure retrofits as part of larger project budget, design and construction.	**Adopt Plans/Educate:** • Comprehensive/transportation plans promote green infrastructure practices in street design. • Local government street project cost estimates include green infrastructure designs and assess cost savings from reduced hard infrastructure.	1 1		
	Remove Barriers: • Technical street specifications allow/require integration of green infrastructure elements into street project construction. • Allow street-side swales to replace conventional curb and gutter for managing stormwater and for separating sidewalks from street traffic in appropriate	1 1		

	circumstances.		
	Adopt Incentives:		
	• Local government undertakes consistent effort to secure state and federal funds (e.g. transportation enhancements) to pay for green infrastructure elements.	**1**	
	• Streets with green infrastructure count towards stormwater requirements.	**1**	
	Enact Regulations:		
	• Local government adopts green infrastructure retrofit standards for major street projects.	**1**	
	• Local government adopts technical specifications and design templates for green infrastructure in private and public rights-of-way.	**1**	
	• All local road projects required to allocate a minimum amount of the total project cost to green infrastructure elements.	**1**	
(2) Question: Do regulations and policies promote use of pervious materials for all paving areas, including alleys, streets, sidewalks, crosswalks, driveways and parking lots? **Goal**: Build and retrofit these surfaces with pervious materials to reduce stormwater runoff and its negative impacts. *Note:* While eliminating sidewalks or placing sidewalks on only one	**Adopt Plans/Educate:** • Local government sponsors/approves pilot programs to determine appropriate pervious materials for different paving areas (e.g., permeable concrete for sidewalks, permeable pavers for driveways, etc.), as well as process for installation and maintenance.	**1**	
	• Pilot project results incorporated into standard practice for all new paved areas and retrofits of existing paved surfaces.	**1**	
	• Local government adopts policy to replace impervious materials with pervious materials where practical.	**1**	

side of the road can reduce impervious cover, this is a strategy that is typically most appropriate for rural areas. However, there are other effective strategies to achieve the same runoff reductions that will not limit residents' options for recreation and transportation **Why**: Streets, sidewalks, and other hard surfaces contribute a large portion to a municipality's total imperviousness. Making these impervious surfaces more permeable protects water quality, reduces flooding and can recharge groundwater.	**Remove Barriers:** • Technical street specifications allow pervious paving materials in appropriate circumstances (e.g., not allowed over aquifer recharge areas).	**1**	
	Adopt Incentives: • Local government creates formal program offering incentives (e.g., cost sharing, reduction in street widths/parking requirements, assistance with maintenance) to property owners who utilize pervious pavement elements.	**1**	
	Enact Regulations: • Local government adopts requirement that some percentage of parking lots, alleys, or roads in a development utilize pervious materials. • Development approvals that allow/require use of pervious materials include requirements for continuing maintenance/cleaning of pervious surfaces.	**1** **1**	
Total score for DESIGN COMPLETE, SMART STREETS THAT REDUCE OVERALL IMPERVIOUSNESS:		**50**	

This section has been reviewed and scored by _____ **(Insert Department name and signee)**

Resources
- Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities*:* http://www.ite.org/css/ (Ch. 6, pages. 65-87)
- Oregon DOT and Department of Land Conservation and Development *Neighborhood Street Design Guidelines: An Oregon Guide for Reducing Street Widths:* http://www.oregon.gov/LCD/docs/publications/neighstreet.pdf

- North Carolina Department of Environment and Natural Resources curb and gutter removal: http://www.p2pays.org/ref/41/40403.pdf

Case Studies
- Portland Green Streets Program capital investments in green infrastructure:
- Chicago's Green Alley Program for using pervious materials:
- Olympia, Washington pervious streets program
- Florida Department of Transportation Mixed Use/Multimodal Corridor Planning

4.	ENCOURAGE EFFICIENT PROVISION OF PARKING			
4.A—Reduced Parking Requirements	**Implementation Tools and Policies**	**Points Available**	**Points Received or N/A**	**Notes and Local Resources**
(1) Question: Does your local government provide flexibility regarding alternative parking requirements (e.g., shared parking, off-site parking) and discouraged over-parking of developments? Do parking requirements vary by zone to reflect places where more trips are made on foot or by transit? **Goal:** Match parking requirements to the level of demand and allow flexible arrangements to meet parking standards. **Why:** Inflexible parking requirements that do not allow for alternative approaches and standards that require too much parking for specific uses increase the amount of impervious surface in a development. Over-parking a development also encourages greater vehicle use and detracts from the overall pedestrian environment.	**Adopt Plans/Educate:** • The comprehensive plan recognizes the advantages to reduced parking requirements generally and specifically for mixed-use and transit-oriented developments. • The comprehensive plan recommends alternative, flexible approaches to meeting parking demands (e.g., shared parking, counting on-street spaces towards site parking requirements, etc.) • Comprehensive/bicycle plans recommend provision of bicycle parking spaces/storage lockers and concomitant reduction in vehicle parking space requirements.	1 1 1		
	Remove Barriers: • Allow flexibility in meeting parking space requirements through shared parking, off-site parking, and similar approaches. • Permit businesses with different peak demand periods to share their required parking spaces.	1 1		
	Adopt Incentives: • Permit reduction in vehicle parking spaces when minimum number of bicycle parking spaces provided. • Allow by-right reduction in parking spaces required (e.g., 25%) in mixed-use and transit-oriented	1 1		

	developments and districts.			
	• Permit developers to undertake parking studies to establish that specific developments (e.g., senior housing, affordable housing) require fewer parking spaces than typical projects.	**1**		
	• Create parking districts to finance/construct centralized parking lots/structures to be utilized as shared parking facilities and reduce on-site parking.	**1**		
	Enact Regulations: • Revise parking regulations to reduce minimums below standard ITE (Institute of Transportation Engineers) requirements based on analysis of local developments and actual parking demand/experience.	**2**		
	• Charge developers for every space beyond parking minimums to offset environmental impacts.	**1**		
	• Enact parking standards that allow credit for adjacent on-street parking.	**1**		
	• Create zones with reduced parking requirements (e.g. transit overlay districts, mixed-use activity centers, multi-modal districts).	**1**		
	• Waive all parking minimums in downtown and other locations that are pedestrian-oriented and/or have good transit access.	**1**		
	• Adopt parking standards that reduce requirements based on sliding scale tied to degree of walkablity/transit access locations (20% reduction in areas well served by bus, 30% reduction in areas served by rail stations).	**1**		
	• Require shared parking agreements where appropriate complementary uses exist.	**1**		

		Points Available	Points Received or N/A	
	• Adopt maximum parking caps (e.g., 125% above minimum) for multi-family and commercial developments.	**2**		
	• Reduce minimum parking space size based on analysis of average vehicle size in jurisdiction.	**1**		

4.B—Transportation Demand Management Alternatives	**Implementation Tools and Policies**	**Points Available**	**Points Received or N/A**	**Notes and Local References**
(1) Question: Are developers allowed to use alternative measures such as transportation demand management or in-lieu payments to reduce required parking?	**Adopt Plans/Educate:** • Comprehensive/transportation plans recognize transportation demand management as an approach to reducing vehicles miles traveled and parking requirements.	**1**		

Goal: Provide flexibility to reduce parking in exchange for specific actions that reduce parking demands on site. Why: Incentives such as transit passes, van pool arrangements, flexible work schedules, market-priced facilities, and separate leasing for spaces in apartments and condos have quantifiable impacts on parking demand. Incorporating them into parking requirements creates the opportunity to meet demand with less impervious cover.	Remove Barriers: • Rather than include parking spaces with an apartment lease, allow tenants to opt-out by treating parking as a separate optional lease agreement.	1		
	Adopt Incentives: • Allow businesses that offer employee transit passes, provide vans for employee commuting, allow flexible working arrangements, or charge market rates for parking to 1) provide fewer parking spaces or 2) pay less into a parking district fund for required parking spaces. • Allow developers to make in-lieu fee payments for parking. Fees utilized by local government/parking authority to provide off-site parking lots/structures. • Provide mechanisms for car sharing in transit oriented development. Where done, area parking requirements are reduced.	2 1 1		
	Enact Regulations: • Create a parking district and allow/require businesses to support public garages rather than provide their own on site parking. • Require large developments to adopted transportation demand management techniques to lower vehicle use and parking demand.	1 1		
4.C—Minimize Stormwater From Parking Lots	**Implementation Tools and Policies**	**Points Available**	**Points Received or N/A**	**Notes and Local References**
(1) Question: Are there	Adopt Plans/Educate:			

requirements for landscaping designed to minimize stormwater in parking lots? **Goal:** All parking lots feature substantial landscaping to help reduce runoff. **Why:** Parking lots generate a large amount of impervious cover. Requiring landscaping reduces the environmental impact of parking and can provide additional community benefits by providing shade and, if appropriately placed, creating natural barriers between pedestrians and cars.	• Comprehensive plan calls for landscaping in parking lots to help reduce stormwater runoff.	**1**		
	Remove Barriers:			
	Adopt Incentives: • Parking lot landscaping, green roofs on parking structures credited towards meeting local stormwater management requirements. • Give additional landscaping credit for preservation of large, mature trees within parking lot. • Do not count parking structures with green roofs against the allowable floor area ratio of a site.	**1** **1** **1**		
	Enact Regulations: • Adopt parking lot landscape regulations that require provision of trees, minimum percent of parking lot interior area to be landscaped (e.g., 10%), and minimum sized landscaping areas (e.g., minimum of 25 square feet for island planting areas). • In parking lot landscaping regulations, specify the types and sizes of shrubs and trees most appropriate for controlling/reducing stormwater runoff. • Adopt standard requiring a minimum area of the parking lot that must be drained to landscaped areas. • Municipalities require that runoff from parking lots is managed with green infrastructure practices, including trees, vegetated islands, swales, rain gardens or other approaches.	**1** **1** **1** **1**		

	• Enact alternative landscaping and parking regulations that are tailored for and support infill development (parking requirements, parking lot landscaping options that focus on perimeter landscaping to encourage smaller lots, etc.).	**2**		
	• Require parking structures to incorporate green roofs to reduce stormwater runoff.	**1**		
	• Reduce drive aisle widths in parking lots to decrease the amount of pervious surface. For multi-family developments, drive aisles can be shared. In commercial developments, typical drive aisles can be reduced 5 - 10%.	**1**		
Total score for ENCOURAGE EFFICIENT PROVISIONS OF PARKING:		**40**		

This section has been reviewed and scored by _____ **(Insert Department name and signee)**

Resources
- U.S. EPA Development Community and Environment Division (2006) *Parking Space /Community Places: Finding the Balance through Smart Growth Solutions* (pg. 14, 18-19, 21) http://www.epa.gov/piedpage/pdf/EPAParkingSpaces06.pdf
- Urban Land Institute (2005) *Shared Parking, Second Edition*: www.uli.org/bookstore/
- Metropolitan Transportation Commission (2007) *Developing Parking Policies to Support Smart Growth in Local Jurisdictions: Best Practices* http://www.mtc.ca.gov/planning/smart_growth/parking_study/April07/bestpractice_042307.pdf
- Maryland Governor's Office of Smart Growth *Driving Urban Environments: Smart Growth Parking Best Practices*: http://www.smartgrowth.state.md.us/pdf/Final%20Parking%20Paper.pdf
- ADD REFERENCE TO DONALD SCHOUP BOOK.

5.	ADOPT GREEN INFRASTRUCTURE STORMWATER MANAGEMENT PROVISIONS			
5.A—Green Infrastructure Practices	**Implementation Tools and Policies**	**Points Available**	**Points Received or N/A**	**Notes and Local References**
(1) Question: Are green infrastructure practices encouraged as legal and preferred for managing stormwater runoff? **Goal:** All types of green infrastructure are allowed and legal. Local government has removed all impediments to using green infrastructure (including for stormwater requirements), such as limits on infiltration in right-of-ways, permit challenges for green roofs, concerns about mosquitoes in rain barrels, safety issues with permeable pavements, and other such unnecessary barriers. **Why:** Green infrastructure approaches have been proven to be more effective and cost efficient than conventional stormwater management practices in many instances and provide other substantial community benefits.	**Adopt Plans/Educate:** • Inform the public, through education and outreach programs, that green infrastructure practices can be used to manage stormwater runoff on their property. • Create a training program for internal and external reviews to ensure that the stakeholders that will be using this tool will have the ability to understand and use it effectively.	1 1		
	Remove Barriers: • Development and other codes encourage and allow property owners to adopt home-based green infrastructure practices, such as rain gardens, rain barrels and other rainwater harvesting practices. • Review and change, where necessary, building codes or other local regulations to ensure that all local government departments/agencies have coordinated with one another to ensure that green infrastructure implementation is legal.	1 1		
	Adopt Incentives: • Green infrastructure practices credited towards required controls for stormwater runoff. • Establish a "Green Tape" expedited review program for	1 1		

	applications that include green infrastructure practices.		

	Enact Regulations:
	
	• Zoning and subdivision regulations specifically permit green infrastructure facilities, including but not limited to: (1 point for each technique to a maximum of 4 points)
	    --Green roofs;
	    --Infiltration approaches, such as rain gardens, curb extensions, planter gardens, permeable and porous pavements, and other designs where the intent is to capture and manage stormwater using soils and plants;
	    --Water harvesting devices, such as rain barrels and cisterns;
	    --Downspout disconnection.
	
	• Developers are required to meet stormwater requirements using green infrastructure practices where site conditions allow. Developers must provide documentation for sites that do not allow on-site infiltration, reuse or evapotranspiration to meet locally determined performance stormwater management standards.
		1 to 4 points
		
		1 to 2 points		

(2) Question: Do stormwater management plan reviews take place early in the development review process?
 	
Goal: Local governments incorporate stormwater plan comments and review into the early stages of development review/site plan review and approval, preferably at pre-application
	Adopt Plans/Educate:
	
	• Encourage/require a pre-site plan meeting with developers to discuss stormwater management and green infrastructure approaches.
	    --Voluntary = 1 point
	    --Mandatory = 2 points
	
	• Include landscape architects in design and review of stormwater management plans.
		1 to 2 points
		
		1		

meetings with developers. **Why:** Pre-site plan review is an effective tool for discussing with developers alternative approaches for meeting stormwater requirements. This can ensure that green infrastructure is incorporated into new projects at early design stages, well before construction begins.	**Remove Barriers:**			
	Adopt Incentives: • Provide accelerated review of projects where developer attended a pre-application meeting.	1		
	Enact Regulations: • Preliminary stormwater plan review occurs contemporaneously with preliminary site plan review and before any development approvals.	1		
	• Development applications must be accompanied by preliminary/conceptual stormwater management plans that incorporate green infrastructure elements and describe how stormwater management standards will be met.	1		
(3) Question: Do local building and plumbing codes allow harvested rain water for non-potable interior uses such as toilet flushing? **Goal:** Ensure that stormwater reuse is allowed and encouraged for non-potable uses. **Why:** Stormwater reuse is important for dense, urban areas with limited spaces for vegetated green infrastructure practices.	**Adopt Plans/Educate:** • Local government provides information brochures/manual for homeowners describing acceptable rain water harvesting techniques.	1		
	Remove Barriers: • Local development, building, and plumbing codes updated to allow reuse of stormwater for non-potable purposes.	1		
	Adopt Incentives: • Reduce stormwater management facility requirements for developments employing comprehensive rain water	1		

	harvesting.			
	Enact Regulations: • Require developments to adopt rain water harvesting techniques as element of stormwater management plans.	**1**		
(4) Question: Are provisions available to meet stormwater requirements in other ways, such as off-site management within the same sewershed or payment-in-lieu of programs, to the extent that on site alternatives are not technically feasible? **Goal**: Allow off- site management of runoff while still holding developers responsible for meeting stormwater management goals. **Why:** In some cases, it is impracticable or infeasible to treat all or even some of the stormwater runoff on- site. In such instances alternative means should be provided through contribution to off- site mitigation projects or off-site stormwater management facilities (preferably green infrastructure facilities)	**Adopt Plans/Educate:** • For infill and redevelopment areas, off-site green stormwater management plans should be developed in cooperation between local government and landowner/developers. Allowing off-site management of stormwater runoff requires sewershed designation within the local government to ensure that true mitigation is possible and equal stormwater management and water quality benefits are achieved with off-site management. • Retrofit projects that will utilize green infrastructure stormwater management techniques should be identified and prioritized within the sewershed.	**2** **1**		
	Remove Barriers: • Amend stormwater management regulations and development codes as necessary to allow off-site stormwater management, especially for infill and redevelopment areas.	**1**		
	Adopt Incentives:			

	Enact Regulations:			
	• Establish system that allows/requires payment-in-lieu fees for off-site stormwater management facilities. Fees should be set sufficiently high as to cover the true cost of off-site management. Consider limitations on amount of off-site management allowed (more for infill areas, less for greenfield sites).	**1**		

5.B—Maintenance/Enforcement	Implementation Tools and Policies	Points Available	Points Received or N/A	Notes and Local References
(1) Question: Does your stormwater ordinance include monitoring, tracking, and maintenance requirements for stormwater management practices? **Goal:** Incorporate monitoring, tracking, and maintenance requirements for stormwater management practices into your municipal stormwater ordinance. **Why:** These measures will help ensure that green infrastructure practices are monitored and tracked over time and remain in proper working condition to provide the performance required by the stormwater ordinance.	**Adopt Plans/Educate** • Local government develops a system to monitor and track stormwater management practices deployed at greenfield and redevelopment sites. Tracking of management practices should begin during the plan review and approval process with a database or geographic information system (GIS). The database should include both public and private projects. • Local government provides model checklist for maintenance protocols for ease of inspection, tracking and enforcement. • Local government sponsors demonstration projects for green infrastructure management best practices.	**1** **1** **1**		
	Remove Barriers: • Ensure that proper local agencies have authority to enforce maintenance requirements.	**1**		
	Adopt Incentives:			

	• Create self-inspection maintenance certification program that allows developers/landowners to train/retain private inspectors to certify compliance with stormwater management plans and long-term maintenance.	**1**	
	Enact Regulations: • Require long-term maintenance agreements that allow for public inspections of the management practices and also account for transfer of responsibility in leases and/or deed transfers.	**1**	
	• Conduct inspections every 3 to 5 years, prioritizing properties that pose the highest risk to water quality, inspecting at least 20% of approved facilities annually.	**1**	
	• Develop a plan approval and post-construction verification process to ensure that stormwater standards are being met, including enforceable procedures for bringing noncompliant projects into compliance.	**1**	
	• Inspections of construction sites are carried out for at least 25% of permitted projects to ensure proper installation of approved practices.	**1**	
	• Require conservation/green infrastructure bond/escrow in zoning/subdivision ordinances to ensure installation/maintenance of green infrastructure storm water management facilities.	**1**	
Total score for GREEN INFRASTRUCTURE STORMWATER MANAGEMENT PROVISIONS:		**37**	

This section has been reviewed and scored by _____ **(Insert Department name and signee)**

Resources

- Development Review:
- Philadelphia's Plan Review checklist and flow chart: http://www.phillyriverinfo.org/WICLibrary/DevelopmentProcess_Final.pdf
- Tucson Water Harvesting Guidance Manual: http://www.ci.tucson.az.us/water/harvesting.htm
- Portland's guidance on selecting stormwater management facilities based on site conditions: http://www.portlandonline.com/shared/cfm/image.cfm?id=129055
- City of Portland Stormwater Destination/Disposal Hierarchy: http://www.portlandonline.com/bes/index.cfm?c=35122&a=55769 (page 1-18)

- Operations and Maintenance:
  - Santa Clara Valley Urban Pollution Prevention Program Operations and Maintenance of Treatment BMPs: http://www.scvurppp-w2k.com/om_workproduct_links.htm
  - Philadelphia Maintenance Agreement: http://www.phillyriverinfo.org/Programs/SubprogramMain.aspx?Id=StormwaterManual

- Inventory and Tracking:
  - Public Entity Environmental Management System Resource Center: http://peercenter.net/
  - U.S. EPA's Environmental Management Systems webpage: http://epa.gov/ems/

Overall Coordination of Water Quality Scorecard

Please indicate by your signature that you have reviewed the tool with all co-signees of this documents (name and department):

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