LOCAL WATER POLICY INNOVATION

A ROAD MAP FOR COMMUNITY BASED STORMWATER SOLUTIONS

American Rivers
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ABOUT AMERICAN RIVERS

American Rivers is a leading national organization standing up for healthy rivers so our communities can thrive. Through national advocacy, innovative solutions and our growing network of strategic partners, we protect and promote our rivers as valuable assets that are vital to our health, safety and quality of life.

Founded in 1973, American Rivers has more than 65,000 members and supporters nationwide, with offices in Washington, DC and the Mid-Atlantic, Northeast, Midwest, Southeast, California and Northwest regions.

ABOUT MIDWEST ENVIRONMENTAL ADVOCATES

Midwest Environmental Advocates (MEA) is the first and only non-profit environmental law center in Wisconsin. MEA provides legal and technical support to grassroots groups that are working for environmental justice in the Western Great Lakes region.

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Funded by The Joyce Foundation

Report design: Gallagher/Wood Design

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A Joint Publication of

American Rivers, Inc.
Midwest Environmental Advocates, Inc.

September 2008

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CHAPTER ONE

LOCAL SOLUTIONS TO STORMWATER POLLUTION

Over the past forty years, environmental organizations have advanced a simple message to address complex global threats: Act locally. While the slogan imparts the conventional wisdom that global change begins with a series of local acts, it also highlights an often forgotten truth. Many environmental concerns are, in fact, local threats with local solutions. Make no mistake, local environmental threats combine to create regional, national, and international threats. Nevertheless, these threats are born locally, felt locally, and most effectively addressed locally.

Stormwater pollution is a prime example of a local environmental issue. At the most basic level, stormwater pollution begins with a local decision to alter the landscape and disrupt the natural water cycle. By turning a natural area into a parking lot, rooftop, or lawn, communities alter the area's hydrology and block natural infiltration. Over time, these local decisions reach a tipping point where stormwater shifts from being a resource to an environmental threat.[1]

In the U.S., communities are reaching this tipping point at a rapid pace. Due to outdated building designs and failed urban planning, U.S. communities are consuming land at a rate three times their population growth rate.[2] Even worse, new rural development often pulls business from existing commercial areas, leaving vacant downtown storefronts and accelerating the migration to outlying areas. At the current rate we are paving open space, our suburban areas will

NRCS

FACT **A typical 10-acre surface parking lot will create 270,000 gallons of stormwater after a one-inch rainstorm. The polluted runoff generally contains high levels of oil and grease, sediment, salt, heavy metals and bacteria.[14]**

expand an additional 68 million acres, roughly the size of the State of Colorado, in the next 25 years.[3] Most of this development will take place in coastal regions which currently house 50% of the US population.[4]

The environmental impacts of these land use patterns, like the economic and social impacts, are felt first in our local communities. Increased impervious surfaces cause increased pollutant loads, water volumes and temperatures in local water bodies. Increased pollution and water temperature cause local algal outbreaks and cloud waters with dangerous toxins and sediment. More and more communities are finding local beaches closed and activities, like swimming and fishing, restricted due to declining aquatic populations and public heath advisories.

Beyond pollution, the increased volume of stormwater is flooding our streets. Our paved surfaces and rooftops generate 16-times more stormwater runoff than the fields they replace, increasing the frequency and severity of flash flooding.[5] In areas that rely on a combined sewer systems, this flash flooding often causes combined sewer overflows (CSOs), dumping tons of raw sewage into vital fresh water bodies, like the Great Lakes.[6]

Ironically, our paved surfaces can also cause streams to run dry at other points of the year. Impervious surfaces block the land's ability to recharge groundwater.[7] In the Great Lakes region, sixty-three percent of the water in rivers and streams comes from groundwater. As a result, one-third of Lake Michigan's water ultimately comes from groundwater discharges to area rivers and streams.[8] As groundwater supplies decrease, rivers dry up and lake levels drop in drier seasons.[9]

By blocking infiltration, we are also reducing our supply of clean drinking water. Due to sprawling impervious surfaces, many urban areas now lose between 300 and 690 billion gallons of water annually that would otherwise be filtered back into their drinking water supply.[10] With less water in shallow aquifers, communities are starting to rely on deep aquifers that may take decades or centuries to recharge.[11]

Ultimately, these local impacts combine to create national impacts. Currently, urban stormwater is the second leading cause of water pollution in the United States.[12] Local stormwater pollution is to blame for eighteen percent of the impaired lakes and fifty-five percent of the impaired estuaries nationwide.[13] Given this national impact, federal and state governments are attempting to use Clean Water Act (CWA) permits to achieve better land use decisions.

However, local environmental protection ultimately relies on local solutions. Regardless of federal laws, our local and regional water quality will not be protected unless we take action at home.

Local Solutions for Stormwater Pollution

Fortunately, there are a wide range of actions a community can take to protect their local resources. For example, to reduce stormwater on a lot-by-lot basis, watershed ecologists, hydrologists, developers, contractors, and engineers have been perfecting a series of "Low Impact Development" (LID) designs. LID designs help minimize impervious surfaces, absorb stormwater, and mimic the natural water cycle. Unlike many concrete detention ponds, which consume land and prevent infiltration, LID designs reduce the volume of stormwater generated on-site and recharge groundwater supplies.

Additionally, local comprehensive land use planning and smart urban growth policies have allowed communities to reduce the need for new impervious surfaces, reuse vacant impervious surfaces, and place development in efficient and low-impact areas.

As EPA recognizes, LID designs and responsible urban growth are absolutely vital to federal, state and local efforts to reduce stormwater pollution.[15] For reasons stated below, local commu-

nities are in a truly unique position to address these vital issues. Therefore, local stormwater initiatives will remain an indispensable component of our nationwide efforts to protect water quality and should be a key focus of concerned residents, watershed groups, and local officials.

Local Governments Have the Experience and Authority to Regulate Land Use

Local governments can build from their history of local zoning and building regulation when implementing stronger stormwater protections. Using state-delegated zoning authority, local governments have been creating zoning districts, setting lot density requirements, and preserving natural resources for nearly a century. The successes and failures of past practices will help local communities create a realistic, lasting solution.

Zoning Process Is Ideal for Stormwater Regulations

Local zoning boards and planning commissions currently review site plans to assure compliance with existing zoning and municipal code requirements. Local governments can use this review process to make sure sites meet benchmarks for stormwater management set by state regulations or more stringent local ordinances. Moreover, the review process provides an iterative, flexible regulatory process that allows well-informed communities to work with builders on site-specific stormwater management measures.

According to Dan Sammartano, Sustainable Design Manager for Alberici Constructors in St. Louis, early integration of stormwater management goals can dramatically increase the success of the project. "In the green design and building area, the goal is always to do the integrated design first because that way you can value engineer [alter designs to lower cost while maintaining performance], and early on in the design you can bring everyone together and find out ways to control cost," Sammartano explains.[16] Often zoning review boards are first to encounter projects and can suggest changes before the first blueprints are even completed. By integrating stormwater management principles into the earliest discussions, the developer can efficiently and effectively change the design to minimize stormwater pollution.

Local Governments Can Reduce Stormwater Through Smart Growth

Local governments have the ability to look beyond each site to make sure the community's growth pattern is not leading to unnecessary impervious area. Local governments can take significant steps to reduce cumulative, long-term stormwater impacts by creating a Comprehensive Plan for growth that organizes, consolidates,

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and minimizes impervious surfaces. Finally, beyond municipal codes, local governments can reduce impervious surfaces by promoting mass transportation, downtown revitalization, and other large-scale policies.[17]

Local Governments Can Remove Barriers to Low Impact Development

With or without local incentives or requirements, more and more developers are shifting to LID designs to reduce long-term costs, offer cost savings to buyers, and meet the public's growing demand for sustainable development. Unfortunately, instead of a red carpet, many developers are met with outdated, mandatory zoning requirements that block their efforts.[18] Zoning density standards, storm sewer connection requirements, and minimum parking and road widths are just a few of the hurdles that face developers that are willing to use LID designs. Regardless of state or federal efforts, innovative solutions will not survive without local cooperation.

Local Action is Vital to the Federal Clean Water Act Permitting System

Too often, local officials categorize stormwater management as a state and federal Clean Water Act (CWA) issue.[19] In fact, local regulation is a key facet of federal permitting requirements, especially with regard to CWA Municipal Separate Storm Sewer System (MS4) permits.[20] While CWA requirements have taken great strides to institute necessary stormwater management practices across the country, CWA permitting agencies cannot alone protect our waters.

First, CWA stormwater permits generally set uniform requirements for entire states, and use local stormwater management plans and ordinances to reduce pollution to the "maximum extent practicable."[21] As a result, local ordinances have been, and will continue to be, the source of many of our nation's most advanced stormwater management approaches, including Low Impact Development (LID) requirements, volume limitations, and pre-existing hydrology requirements.[22]

Secondly, state and federal permitting agencies have limited resources and access to monitor and enforce stormwater requirements. While federal and state environmental agencies can provide expertise and vision for effective stormwater management, the nature of stormwater pollution makes centralized enforcement very difficult. Federal and state agencies will inevitably look to local governments for aid in monitoring and enforcement.

Finally, while the CWA gives EPA the authority to set stormwater management benchmarks for entire communities or watersheds, it provides little authority over the shifts in urban growth patterns that are necessary to avoid generating new sources of stormwater pollution. Without local efforts to adopt sustainable comprehensive urban growth plans, it is very difficult to adequately protect the health of local waterways overtime.

Individuals Have Great Power to Create Change on a Local Level

The effort needed to create change on the state or federal level often discourages the average community member. On the local level, however, individuals can gather support and more quickly capture the attention of policy makers. As busy people, we tend to support efforts that have a tangible outcome. Therefore, local initiatives with local results are particularly rewarding and attractive to supporters.[23]

CHAPTER TWO

UNDERSTANDING THE LOCAL POLITICAL LANDSCAPE

Despite the importance of local regulation and accessibility of local government, many community members do not participate in the local legislative process. Often the public is unaware of local initiatives, feels intimidated by the legislative process or public exposure, or feels that local government has little power over environmental protection.

These local barriers all have one common root: public awareness. You can effectively remove barriers by raising public awareness of the issue, presenting solutions, starting a community discussion, and convincing people to show up at the meetings. Local government is filled with your neighbors and is set up to respond to your concerns. After attending a few meetings, you will see people like yourself raising a range of concerns to their neighbors on the local board.

Most importantly, if you read through your municipal code, you will see powerful protections and initiatives that were started by a few voices at these local meetings. If you can generate awareness and pack a local meeting, the sky is the limit.

The following overview will give you general background on the local legislative process. However, for specific information on your community's code, check your local government's website, Municode,[24] or call City Hall (or your community's equivalent). Community members can get involved by reading applicable zoning code sections, using these resources to find out which government body has authority to act on your proposal, writing to the body's members, and attending the next public meeting.

Local Legislative Bodies Control New Ordinances

Like state or federal government, local decisions to pass ordinances are ultimately made by the local legislative body elected by the public:

Municipal Classification	Government Body in Charge of Passing Ordinances
City	City Council
County	County Board
Village	Village Board
Town	Town Board or County Board (depending on established local powers)

Planning Commissions Provide Guidance and Help Implement Ordinances

In addition to the local legislative body (i.e. City Council), your community likely has a Planning Commission or similar subcommittee that specializes in land use issues. The Planning Commission is not generally elected but rather appointed by the Mayor. As such, the Planning

Urban sprawl is a serious problem in many parts of the country.

JIM KRUGER/ISTOCK.COM

Commission does not have authority to pass laws, but can give powerful recommendations to the legislative body. Additionally, once an ordinance is enacted, the Commission is typically given the responsibility of reviewing proposals, holding public hearings, and implementing ordinance requirements.

Given the Commission's role in reviewing and recommending ordinance proposals, it is helpful to approach members of the Planning Commission early in the process and convince them to support the initiative.

Make Sure Your Community has a Zoning Code

Unfortunately, due to urban sprawl, much of our recent growth has been concentrated in rural areas that have not needed or wanted zoning laws. For example, in Ohio, the population in unincorporated areas grew by nearly 20% between 1970 and 2000, far greater than the roughly 5% population growth in Ohio metropolitan areas.[25] Now, more people live in unincorporated Ohio townships than in Ohio cities with a population of 50,000 or more.[26] Nearly half (46%) of these townships do not have zoning laws.[27]

The key to managing growth in these areas is a clear and persistent education campaign that highlights the necessity of planning and zoning. In Ohio, studies show that perceived public support is the primary reason a community adopts or avoids zoning laws.[28] By openly discussing the need for land use planning, you will help show local officials that your community supports zoning powers and comprehensive planning.

If your community does not have a zoning code, check with your county board for any county-wide zoning code that would apply to your community. If the county government has zoning regulations that apply to your community, you can work to change county ordinances or look for ways to have your local government assume zoning authority.

Enacting Zoning Laws

If your community does not have a comprehensive plan or zoning code, your efforts may be

best spent convincing local officials that these tools are necessary to efficiently use resources, protect vital areas and protect economic development. Without zoning laws, your community can still regulate the use of fertilizers and other pollutants, and set standards for certain activities such as construction and land disturbing activity. However, long-term stormwater management relies on responsible design standards and land use planning that are set forth in zoning codes and comprehensive plans.

Most often, state laws grant zoning authority to "incorporated" municipalities such as cities and villages and give counties the option of creating zoning standards for unincorporated areas outside of cities and villages. For example, in Wisconsin, towns must elect to obtain zoning powers (called "village powers") and receive approval from their county to assume authority over local land use.[29]

However, this structure is not universal. For example, in Ohio, the state gives township governments the authority to zone and regulate local land use in unincorporated areas (areas outside cities).[30] In this structure, townships dictate how county governments set county-wide zoning restrictions.

Therefore, if you are not in a city, take some time to determine whether there are town or county zoning laws and, if not, the process for electing such powers. For information on enacting local zoning check your state's League of Municipalities, Towns Association, County Directory website, or state university publications on zoning powers.[31]

Procedure for Adopting Local Ordinances

Once local zoning power is established, your goal is to create ordinances that avoid, mitigate, and minimize stormwater pollution. Most often you will be proposing new or amended local ordinances that require local legislative approval.

To start this process, you should approach your council representatives with the proposed ordinance and request a hearing to discuss the proposal. With many ordinances, the council may refer the proposal to the Planning Commission for initial review and discussion. After a hearing or two, the Planning Commission will send the ordinance proposal, with any alterations made by the Commission, to the council with a recommendation to enact the ordinance or drop it. Most communities set specific procedures for enacting zoning ordinances in their code. Check your local ordinances or municipal code for any legislative procedures that are prescribed for enacting ordinances.

TIP **When looking for procedural requirements in your municipal code, make sure the section applies to the action you are proposing. Often, a code sets separate procedures for certain categories of legislative action, such as establishing an overlay district, that need to be followed.**

Remember, letters to the Mayor, Planning Commission, council and newspapers are highly recommended to keep momentum. In the end, community pressure will be responsible for the success or failure of your proposal. Make sure the supporting voices are educated, loud, and persistent.

Direct Legislation and Advisory Referenda

If your local government refuses to take action, you may be able to take your proposal to a public vote. In some states, community members can get the proposed ordinance on an election ballot if the measure is supported by a specified number of petition signatures.[32] However, if such authority exists, it often excludes mandatory changes to your zoning codes or comprehensive plans.[33]

Whether or not a binding referendum or initiative is available, you may approach the council with an advisory referendum proposal that would allow the community to express its support or opposition to a proposed measure. Before pursuing an advisory referendum vote, make sure you have spent time educating the greater community and have widespread support to help assure a positive vote.

CHAPTER THREE

CHOOSING A LOCAL REGULATION OR POLICY

The following ten guidelines will help guide your selection of potential stormwater management measures. As described below, these guidelines range from specific categories of standards to general mechanisms for implementation. In the end, the unifying characteristic of the following ten guidelines is simple: Each guideline represents a set of vital issues to consider when selecting an appropriate stormwater initiative.

1. Review Current Zoning Code for Regulatory Barriers and Quick Improvements
2. Set Performance-based Standards
3. Take Additional Measures to Reduce Impervious Surfaces
4. Promote the Use of a Few Specific LID Designs
5. Use Overlay Districts to Add New Requirements to Existing Zoning Districts
6. Establish Standards or Incentives to Improve Stormwater Management in Developed Areas
7. Address Storage/Use of Pollutants That Contact Stormwater
8. Create and Protect Buffers to Vital Water Resources
9. Require Use of LID Designs for Municipal Projects
10. Connect Your Zoning Decisions to a Comprehensive Plan

1 Review Current Zoning Code for Regulatory Barriers and Quick Improvements

In surveys across the country, architects and builders have cited existing zoning code standards and requirements as a primary barrier to using/applying Low Impact Development (LID) techniques.[34] Designs that voluntarily reduce stormwater are often blocked by out of date standards or discouraged by redundant requirements. Before your community creates new incentives and requirements to encourage LID, make sure the zoning code allows these efforts. Often, by merely removing these barriers, communities

BETSY OTTO

will see an increase in voluntary LID designs. Additionally, zoning codes generally contain landscaping and setback requirements that could be amended to promote on-site stormwater management. If developers are already required to maintain a certain percentage of open space, why not encourage developers to use this space to reduce stormwater from the developed area? In many cases, developers are already designing projects with landscaped features that could be slightly altered to reduce stormwater. These small zoning code changes are often easy to accomplish and widely accepted by developers. For specific examples of code barriers and opportunities, consider the following:

Reduce or remove parking requirements.[35]

Instead of setting minimum parking requirements, communities can set a maximum limit to eliminate unnecessary parking areas. At the very least, the zoning code should determine parking requirements on a per site basis and allow for flexibility.

Example: In Portland, OR, city officials recently removed all minimum parking requirements in the downtown commercial district to encourage compact growth and reliance on mass transit.[36]

Remove or decrease mandatory road width.

Many new roads are unnecessarily wide and could be reduced to minimize runoff. Often, communities can narrow street widths without affecting the prescribed traffic patterns. For greater results, however, some communities have increased the use of "queuing" streets, which contains a single travel lane and occasionally requires an opposing driver to pull over to allow an oncoming vehicle to pass. These roads are common in older residential areas and have been generally well received when reintroduced in new residential areas.[37]

However, whenever addressing road width make sure you discuss alternatives with your local Public Works representatives and Fire and Police departments. A primary concern associated with narrow roads is emergency vehicle access. With early attention, many of these concerns are easily addressed.[38] Additionally, by taking a collaborative approach you are more likely to identify an acceptable width and garner support from these all-important city departments before approaching the governing body.

Example: In Seattle, WA, reduced roadway widths and roadside swales have reduced runoff by 97 percent while creating a beautiful median.

Remove Storm Sewer Connection Requirements.

Far from encouraging on-site stormwater management, many municipal codes require landowners to connect impervious areas to the storm sewer system. The connection requirements, originally intended to reduce flooding, are out of date and fail to recognize LID designs as a practical and beneficial solution to stormwater volume concerns.

Integrate LID into existing landscaping requirements.

Most communities already have landscaping requirements in their zoning codes, often sur-

TIP **Use the Center for Watershed Protection's Code and Ordinance Evaluation Worksheet to evaluate your current code's stormwater management requirements and identify areas for improvement. (www.cwp.org/COW_worksheet.htm). The worksheet awards points for specific policies and requirements and proves a range description for total points earned. The James River Association in Virginia, applied this tool to analyze the codes and ordinances in counties throughout their watershed. Working with the Center for Watershed Protection and local universities, the group has identified barriers to smarter stormwater solutions and is using the results to target changes. See, James RiverAssociation www.vaco.org/sitefiles/pdfs/front%20page/ building%20a%20cleaner%20james%20river%20aug06_final.pdf.**

rounding parking areas. Landscaping requirements provide a perfect avenue for integrating LID designs. Instead of requiring generic landscaping, require developers to design the landscaped area to function as a swale and receive stormwater from nearby impervious surfaces.

Finally, restrictive covenants and easements can be used in common subdivision plats or individual lots to require landowners to maintain the LID features on their lot. For example, rain gardens require long-term maintenance to adequately manage stormwater. Restrictive covenants and easements "run with the land" and are binding on all future landowners.

2 Set Performance-based Standards

When setting stormwater management standards, communities can regulate the design or performance of a particular land use. Design or "prescriptive" standards mandate the use of particular design features, such as green roofs. Performance-based standards require a site to function in a particular way, regardless of the design. Among the design and building community, performance-based standards allow for greater function at lower costs than prescriptive standards because they allow for creative and integrated designs. Often developers will accept stricter performance-based standards if the standards are clearly stated, uniformly applied, and open to varying approaches. In the end, by focusing on performance-based standards, your community can reach its goals while minimizing the impact on developers.

There are, however, barriers to adopting performance-based standards. First, not all sites are capable of managing stormwater equally and, therefore, uniform performance-based standards can be either too restrictive or too lenient for a particular site. Second, communities often lack expertise needed to select a performance standard that is both adequate for watershed protection and practical for developers. Both of these concerns can be addressed by considering the following guidelines:

Use Accepted Performance Benchmarks.

When it comes to selecting a performance-based standard, communities do not need to "recreate the wheel." Stormwater engineers, developers, and regulators have been analyzing appropriate performance standards for years. From this research, a set of accepted performance standards has emerged and can be used in your community.

❖ **Maintaining Pre-development Hydrology.** Perhaps the most effective strategy for addressing stormwater pollution is to require developers to retain pre-development hydrology. To meet this standard, developers must demonstrate that the new site will have the same runoff volume, temperature, flow rate, and infiltration rates as the pre-development site.

Pre-development hydrology standards are site-specific, recognizing that the natural water cycle is different on clay soils than sand soils. While uniform standards are too harsh for some and too lenient for others, the site-specific standard is tailored to fit each project. On the other hand, the pre-development hydrology standard requires a more in-depth plan and review process and creates some uncertainty for developers early in the process.

Example Pre-existing Hydrology Ordinances:

- City of Chapel Hill, NC[39]
- Grand Traverse County, MI[40]
- Center for Watershed Protection: Draft Post-Construction Stormwater Model Ordinance Tool[41]
- City of Clayton, OH[42]

❖ **Benchmarks for On-site Stormwater Retention.** To ease the review process and create a clear standard, communities often require developers to retain and infiltrate a designated percentage or volume of stormwater. The uniform standard makes the review process more efficient and predictable, and dramatically reduces impacts on surface and groundwater.

Examples:

- Chicago, IL, requires that new construction

PATRICIA PENNELL

Green Roofs not only help reduce stormwater runoff, but they also lower building energy use.

projects capture the first ½ inch of runoff from all impervious surfaces or achieve 15% reduction in impervious surfaces from an established baseline.[43]

- Philadelphia, PA requires sites to manage the first inch of runoff from all directly connected impervious areas (connected to storm sewers). The requirement must be met by "infiltrating the water volume unless infiltration is determined to be infeasible (due to contamination, high groundwater table, shallow bed rock, poor infiltration rates, etc.) or where it can be demonstrated that infiltration would cause property or environmental damage." [44]

❖ **Pollutant reduction and flow rate standards.** Pollutant reduction and flow rate standards are used to address dirt, oil, and other pollutants found in stormwater, as well as the threat of flash flooding. While these measures are important to reduce pollution, they do not adequately address loss of groundwater, increased temperature, and long-term effects on downstream volume and bank erosion.

EXAMPLE: Madison, Wisconsin's Stormwater Ordinance requires 80% reduction of Total Suspended Solids (TSS), oil and grease removal, and flow rate standards from construction sites greater than 4,000 square feet in size.[45] The State of Wisconsin requires all cities with small Municipal Separate Storm Sewer Systems (MS4s) to reduce TSS by 20% by 2008, and 40% by 2013[46].

❖ **Require Information Gathering.** Site-specific information gathering early in the design process is vital to your community's effort to implement performance-based standards. Developers can use the information to analyze a range of alternative designs before costs are sunk into the project. Zoning review boards can use the site-specific information and design alternatives to assess the need for variances and alternative standards. Information requirements should at least include the following data: soil type, pre-development and post-development runoff volume, existing stormwater management areas and buffer zones, maps of impaired and high quality water, and expected post-development runoff pollutants.

> Beyond stormwater, impervious surfaces are often associated with increased air pollution, urban temperature, and energy consumption.

3 Take Additional Measures to Reduce Impervious Surfaces

While performance-based standards are often most efficient, they should not necessarily replace all design or "prescriptive" standards in your code. Invariably, some projects will be unable to meet performance standards, yet could nevertheless make design changes that would reduce stormwater pollution. Additionally, some practices, such as the use of rain barrels and downspout disconnection, are so inexpensive and universal that they could be expected on all sites.[47] Finally, some design features must be addressed to adequately reduce stormwater pollution.

At a minimum, your community should address the size and location of impervious surfaces for each new construction project. Impervious surfaces increase stormwater volume and pollutant loading, prevent infiltration, and replace natural buffers. Additionally, large impervious surfaces, such as parking lots, generally reduce density, accelerate sprawl, and lead to greater impacts on a watershed's hydrology. Beyond stormwater, impervious surfaces are often associated with increased air pollution, urban temperature, and energy consumption.[48]

Therefore, in addition to performance based standards, your community should take specific steps to promote compact developments and reduce impervious surfaces. These efforts should include short-term, site-specific requirements, as well as long-term policies that address sprawl. All of the following standards, incentives, and policies share two common goals: 1) Reduce the impervious footprint of new projects; and 2) Draw developers to vacant infill sites.

Using Standards to Limit Impervious Area

❖ **Set Footprint Caps.** Compact development opens the door to a range of benefits. First, compact designs reduce impervious surfaces and allow greater on-site stormwater management. Second, by reducing the project's footprint, new developments are more likely to fit into infill sites, eliminating the need for new impervious surfaces. [49]

Consider the following issues when choosing a footprint cap:

Overall Impervious Cap v. Building or Parking Cap. An overall impervious cap can directly address key concerns—stormwater runoff and compact development—with some flexibility for developers (i.e. larger building footprint and structured parking or another combination). Nevertheless, your community may decide that large surface parking lots or, likewise, single-story strip malls have no place in your community. In these situations, a specific building footprint or parking footprint cap could be used.[50]

Percentage v. Square Footage Caps. Impervious surface limits are often expressed by a percentage cap (limiting the percentage of a site that used for impervious surfaces) or a square footage cap (limiting the gross area of impervious surface on a site). Watershed degradation is often analyzed with respect to the percentage of the watershed that is impervious, leading many communities to adopt percentage caps for each site. For example, studies have consistently shown that watersheds experience damage as imperviousness increases, with some research showing a threshold of noticeable damage once 10 percent of a watershed is impervious.[51] To protect watersheds, some communities are using this research to limit impervious surfaces to 10 percent or less of a proposed site.

However, despite the widespread use of percentage caps, communities often stand to gain far more from square footage caps. First, percentage caps do not limit the amount of impervious surface that drains to the storm drain. A percentage cap allows a big-box retailer to put in a large surface parking lot that drains to the river, as long as the retailer purchases a large enough piece of property to balance out the percentage. Unless the open space is used for stormwater detention, the cap will not meet its objective.

Second, percentage caps tend to discourage compact commercial districts and promote

urban sprawl. Compact commercial districts have higher percentage of impervious surface per plot, but reduce the need for road, sidewalk and parking lot surfaces. Using a percentage cap, communities require large open spaces around each impervious plot and create larger distances between each development. The larger distances create a need for more roads and parking lots. While each site is potentially greener, the overall sprawl leads to air and water pollution.

In the end, the best impervious cap is one that directly limits that amount of impervious surface on each site and promotes compact development. Whether choosing a percentage cap, square footage cap, or both, your community should make sure the limitation you choose effectively accomplishes these goals.

Including Impervious Caps in Large Retail or "Big-Box" Ordinances. More and more communities are establishing a separate set of standards to address unattractive, sprawling big-box development. However, when setting standards, most fail to address a vital design flaw—excessive impervious area.

Big-box development, including the adjacent surface parking area, is one the clearest sources unnecessary stormwater pollution. One-story big-box stores create up to 40 acres of impervious area that send hundreds of thousands of gallons of polluted stormwater to nearby waterways. Fortunately, some large retailers have shifted to designs that reduce these impacts by moving parking underground, building a second and third story, or by filing in vacant big-box sites in certain areas.

By setting size caps for large retail, your community can require the latest, most efficient retail designs. Impervious area caps will not only reduce stormwater from the site, but promote the reuse of vacant big-box develop-

CASE IN POINT: **In Monona, Wisconsin, a city that is surrounded by water and neighboring Madison, there is little room for greenfield development. With open space at premium, new developments are forced to consider more compact designs that create far greater benefits to the community. For example, in 2006, Wal-Mart, Inc. began building a 200,000 square-foot Supercenter on the site of a vacant K-Mart. The 15-acre site is half the size of a traditional Supercenter and forced Wal-Mart to use underground parking instead of the standard surface lot. As a result, the new store will actually reduce the amount of stormwater that is flowing off the vacant site and entering Monona's storm sewer system.**

Unfortunately, without size constraints, communities generally lose these benefits. Only months after finalizing plans for the 15-acre Monona Supercenter, Wal-Mart received local approval in Hartford, Wisconsin to construct an 184,000 square-foot Supercenter on a 30-acre former farm and wetland area that borders the Rubicon River. Before selecting the site, Wal-Mart was required to look for other sites that would reduce the environmental impact, but eliminated vacant 15-20 acre downtown sites because they would not accommodate the traditional 25-30 acre design. With no incentive or requirement to use a more compact design, Hartford ultimately accepted 30 acres of new pavement and 16-times more stormwater from the site, while 15-acre downtown sites remain vacant.

ment sites that are overlooked for larger, greener pastures.

❖ **Set Open Space/Cluster Development Requirements for Residential Subdivisions.** Communities can create "overlay" residential districts to promote Low Impact or "Conservation" subdivisions. Overlay districts create additional standards, above and beyond the base zoning district requirements. Conservation subdivision overlay districts increase density and reduce lot size to retain as much vegetative cover as possible, reduce roads and impermeable surfaces, and treat stormwater on site. [52]

EXAMPLE: In Hamburg Township, MI, the zoning code includes an "Open Space Community" Planned Unit Development designation where the development must keep 40% of site as open space with deed restriction prohibiting future development.

❖ **Address Placement of Impervious Surfaces.** In addition to an impervious area cap, your community should consider maximum setback requirements between impervious surfaces and natural or pervious surfaces. For example, a city can require "zero effective impervious surfaces" which mimic natural areas by keeping natural buffers within fifteen feet of all impervious surfaces and retaining sixty percent of the natural vegetation.[53] The impervious setback requirement functions like any other setback requirement in the code. This measure may be appropriate for local governments that are leery of capping a development's size, but are willing to set more stringent design standards to reduce impact.

EXAMPLE: Lacey, WA has a voluntary "zero discharge" zoning code.[54]

❖ **Set Maximum Limits for Parking.** Many of us have driven past expansive surface parking lots that are less than half full. Most lots are designed for the peak demand that is only around for a few hours, on a few days per year.[55] To prevent retailers from creating unnecessarily large parking areas, many communities are setting maximum parking limits in their zoning code. These parking limits may apply to all parking or just surface parking, leaving open the possibility of additional structured parking.

EXAMPLES:

- Toledo, OH sets a maximum parking requirement (150% of minimum parking) to reduce unnecessary impervious surfaces.[56]
- San Francisco, CA prohibits downtown parking from consuming more than 7% of the proposed retail area.[57]

❖ **Require Permeable Surfaces for Low-traffic or Peak Parking Areas.** If your community is committed to allowing or requiring businesses to supply off-street peak parking, advocate that developers use lawn areas or permeable/pervious pavers (e.g. lattice, pervious pavement, etc.) to cover the peak parking spaces. Instead of unnecessarily gathering stormwater runoff, these areas will retain their natural function when not serving peak demand.

Additionally, non-peak parking areas have impervious surfaces that are unnecessary. The areas between tires in individual parking stalls and near storm drains receive very little traffic. Natural vegetation or permeable pavers would reduce the unnecessary stormwater pollution from these areas.[58]

EXAMPLE:

- Palo Alto, CA allows up to 50% of the parking supply requirement to be managed as landscaped reserve.
- Iowa City, IA, developers can maintain 30% of the parking supply as landscaped or lawn area.

❖ **Set Mandatory Impervious Caps for Newly Annexed Land.** To effectively preserve open spaces and healthy natural systems, make sure your community sets heightened standards for annexed land. Annexed land is generally open space that borders a city's limits. When the land is annexed into the city, the city assigns a zoning designation and set of development requirements for the open space. Often, these early designations determine whether the land will be the next

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big-box parking lot or the next natural infiltration area within the city. Help your local officials make the right choice.

Provide Market Incentives for Compact or Infill Development.

In addition to, or instead of, the above-listed standards, communities can establish a system of positive and negative market incentives to lead developers toward more sustainable stormwater management practices.

❖ **Tax Incentives for Infill Development and LID Designs.**[59] Increased costs of choosing infill locations or using LID designs, whether real or perceived, often deter developers. By providing tax breaks for these development choices, your community could remove this barrier. Over time, these tax breaks are recouped through an increased downtown tax base and decreased expenditures on stormwater management and infrastructure.

EXAMPLE: Downtown Tax Incremental Financing. If properly used, Tax Incremental Financing (TIF) districts can offer incentives for developers to redevelop blighted urban areas.[60]

❖ **Provide Floor-to-Area Ratio(FAR) Bonuses for Infill Developments and LID Designs.** Zoning codes often include a maximum floor-to-area ratio (FAR) which limits the amount of floor space or density that a building can have for a specified plot size. FAR standards are generally used to avoid overly-dense developments that drain surrounding city services and infrastructure. However, if developers agree to use designs that reduce the site's impact to the surrounding community, it seems reasonable to allow developers to increase density. For infill areas, these FAR or density bonuses can bring in even more development to vacant areas of the city, increasing the future tax base.[61]

EXAMPLE: In Portland, Oregon developers are given FAR bonuses if the design incorporates an "eco-roof."[62]

❖ **Give Incentives to Use Conservation or "Cluster" Developments.**[63] Standardized zoning densi-

By reducing curbs, unused parking and building more green areas, stormwater pollution can be reduced while improving a neighborhood's appearance.

> There are costs associated with good and bad design. Unfortunately, most costs associated with bad designs... are assumed by the public.

ties and uniform development rights discourage cluster development. These uniform zoning techniques prevent developers from recouping the value of undeveloped plots by creating greater density in areas that are developed. Transfer of Development Rights (TDR) policies allow developers to shift development rights to a "clustered" area and build with greater density. Using TDR, zoning officials can preserve natural areas in residential subdivisions for stormwater treatment and still allow developers to preserve their financial investment.

❖ **Create Incentives for Structured or Shared Parking lots.** Across the board, your community loses with surface parking lots. Economically, these lots waste retail space, break up commercial district, and discourage "crossover" business from neighboring retailers. Environmentally, these lots accelerate sprawl and produce an amazing amount of stormwater runoff.

Parking structures, above-ground or underground, can dramatically reduce a site's impervious area compared to surface lots with comparable capacity. Unfortunately, structured parking is not typically cost-effective unless land prices exceed $1 million per acre.[64] Therefore, economics alone will not bring structures to suburban areas where land is relatively cheap. Communities need to actively change the standards for parking design through zoning code amendments and financial incentives:

Communities can help equalize costs by providing Floor-to-Area Ratio (FAR) bonuses for developments with structured parking. The increased density on the existing footprint coupled with the potential for more productive use of the land once dedicated to surface parking creates a financial incentive to shift to structured parking. Communities can add to this incentive by reducing taxes, accelerating the review process, and lowering minimum parking standards for buildings with structured parking.

Finally, communities can create a Payment-in-Lieu or Fee-in-Lieu program which allows developers to reduce the number of spaces required on site by paying into a government account that is to building shared parking structures, investing in transit, or other strategies that reduce vehicle-related development impacts.

EXAMPLES:

- ❖ Westport, CT has a $2,000 per space payment-in-lieu program;[65]
- ❖ Suffolk, VA offers density bonuses as incentives for converting surface parking to structured parking (for each 100 spaces of surface parking converted to structured parking an additional 20,000 feet of non-residential space may be constructed);
- ❖ Sioux Falls, IA, allows for density bonuses that vary according to the percent of required parking that is within a structured parking facility (If 100% of the required parking is within a parking structure, the project receives a 10% density bonus; if 50% of the spaces are within a structure, the project receives a 5% density bonus).[66]

❖ **Offer a Menu of Incentives.** Instead of selecting a specific incentive, you may offer a range of incentives from which developers can choose the incentive that helps the most. For a longer list of possible incentives, visit the Green Building Council list of green design incentives.[67]

Remove Incentives for Sprawling Greenfield Developments.

Most municipal zoning codes currently allow developers to use cheaper, sprawling designs without assuming the corresponding cost to the community.[68] While not explicit, these zoning codes essentially create an incentive to build in greenfield areas. In order to successfully attract developers to more compact infill areas, your community must remove these incentives and recognize the true cost of greenfield growth.

❖ **Internalize Costs Associated with Impervious Surfaces.** There are costs associated with good and bad design. Unfortunately, most costs associated with bad designs, such as one-story big-box developments and surface parking lots, are assumed by the public. If all costs and benefits of a design choice were assumed by the devel-

oper, as is intended in a free marketplace, developers may voluntarily change behavior. There are a range of methods communities use to impose "true-cost accounting" of costs and benefits of a specific design. For example, stormwater utilities, or fees per square foot of impervious surface, can help internalize the costs of disrupting the water cycle.[69] The key is establishing a rate that compensates the public for all costs associated with increased stormwater runoff. If the rates are accurate, they can give the developer an accurate choice—design your building to minimize impervious surfaces and manage stormwater on site, or pay for the city to do it for you. In many communities, the rate does not accurately reflect the public costs and creates little incentive to have a less impervious design.[70]

Additional Example: Cost-of-Community Service Assessments and Fees.[71]

❖ **Adopt a "Fix-it-First" Infrastructure Policy.** To address both rising costs of infrastructure expansion and declining condition of existing infrastructure, cities and states are beginning to adopt "Fix-it-First" policies. According to the policy, maintenance projects for existing infrastructure will take priority over expansion projects. As a result, developers are more likely to receive necessary infrastructure upgrades in infill areas than greenfield areas. The policy is particularly effective because it provides both an incentive for downtown growth (quicker upgrades), and a disincentive for sprawl proposals (slower upgrades).

Example: Currently, Michigan, Massachusetts and New Jersey have adopted state-wide Fix-it-First policies.[72]

❖ **Surface Parking Tax.** Communities may create tax rates that apply to parking surfaces over a designated size. The larger the parking lot, the greater the cost to the developer. The tax funds may be used to fund structured parking lots or mass transit initiatives.

NEWSFLASH:

Communities are Filling in Parking Lots with Additional Retail and Housing

Across the nation, suburban mall owners are beginning to view surface parking as lost profits. Recognizing that pavement can be turned into additional retail area, developers are starting to replace mall parking lots with compact parking structures and expanding mall retail area. For example, in Glendale, Wisconsin, developers turned parking into 1.1 million square feet of retail by simply shifting to structured parking.[73] The community gained more retail without increasing impervious area.

"If you look at the shopping centers that were built over the last 50 years, many of them were built in what would be called greenfields," said Thomas J. D'Alesandro IV, Senior Vice-President of Development and Redevelopment at General Growth Properties. "Now they are in-fill. And like any urban areas, they are subject to higher and better uses than just a one- or two-story mall surrounded by surface parking."[74]

Sources: Janine Anderson, "Born Again: Project Team Gives Bayshore New Life," Wisconsin Builder, April 30, 2007 www.eppsteinuhen.com/data/pdf/WI%20Builder%20Top%20Projects%202006%20-%20Bayshore.pdf; Joel Groover, "'Lot' of Options," Shopping Center Today, International Council of Shopping Centers, Sept. 2006

Adopt Smart Growth and Traffic Demand Management (TDM) Programs.

According to the Center for Watershed Protection, as much as 65% of the impervious surface cover in the U.S. is designed for cars, including streets, parking lots, and driveways.[75] If we reduce our dependence on car travel or reduce the distances we drive, we reduce demand for impervious surfaces. Therefore, by promoting smart growth planning and mass transportation policies, your community is eliminating sources of stormwater pollution. Among other long-term planning policies, consider the following:

❖ **Reduce Parking Requirements near Transit Stops.** By allowing developers to create more residential or commercial units near transit stops communities connect residents with mass transit. Moreover, with less off-street parking in these areas, residents are encouraged to use the nearby transit system.

EXAMPLE: In Seattle, Washington developments are not required to provide off-street parking for residential developments near mass-transit stops.[76]

❖ **Require Pedestrian-friendly Site Design.** Storefronts that border sidewalk areas are more attractive to pedestrians. Instead of placing a large parking lot between the front doors and sidewalks, require commercial buildings to place all parking in the rear of the building. In addition to a pedestrian-friendly entrance, the lack of a visible parking lot generally discourages driving. Examples of big-box retailers with sidewalk entrances can be found in cities across the country.[77]

❖ **Increase On-street Parking.** On-street parking traditionally uses less impervious surface than off-street parking.[78] Equally as important, on-street parking provides a buffer between sidewalks and streets that encourages pedestrian travel. Both of these outcomes reduce stormwater pollution in the long-run.

❖ **Expand Mass Transit Opportunities.** Any effort to discourage car travel must be met with efforts to increase access to viable, convenient mass transportation options. The more reliable and accessible mass transit is for those that drive, the more likely people will save their gas and come aboard. Without mass transit, pressure for more roads and parking lots will continue to mount.

❖ **Promote Traditional Neighborhood Districts (TND) and Transit-Oriented Development (TOD).** Beyond the individual site designs, communities can create entire districts that connect residential and commercial areas. Traditional Neighborhood Districts (TND) and Transit-Oriented Neighborhoods (TOD) are well-established districts that promote mass transit, mixed use retail areas, and pedestrian travel. For TND and TOD zoning requirements consult the following references:

EXAMPLES:

❖ Model TND Ordinances: Massachusetts Executive Office of Energy and Environmental Affairs, "A Model Ordinance for a Traditional Neighborhood Development," Smart Growth Toolkit.[79]

University of Wisconsin Extension, "A Model Ordinance for a Traditional Neighborhood Development," Approved by the Wisconsin Legislature, July 28, 2001.[80]

❖ TND Ordinance Examples: Austin, TX uses "special base district" that offers greater density, small commercial districts, and transit-oriented designs.[81]

The City of Concord, NC set up a TND as a "special district" that requires a rezoning hearing and plan review. These districts promote density and encourage small commercial districts within a traditional neighborhood.[82]

❖ **Other Smart Growth Principles.** In addition to the measures discussed in this tool-kit, the American Planning Association (APA) offers a long list of suggested zoning measures that advance Smart Growth principles.[83]

4 Promote the Use of a Few Specific LID Designs

In some communities, certain LID designs are particularly popular. In addition to, or instead of, performance-based requirements, communities are promoting specific LID designs in their zoning code. For example, in the City of Chicago, green roofs are particularly popular because they have the dual function of reducing stormwater and regulating building temperatures. Viewing green roofs as a cost-effective way to dramatically reduce both stormwater and energy demand, Chicago's Mayor Daley has set specific incentives for a menu of LID designs, most specifically green roofs. By emphasizing one individual design, the City kept the process simple, opened the door to greater media coverage, and in the end, created greater awareness of green design.

Whether green roofs, rain barrels, or another specific stormwater abatement measure, your community can make one LID technique the "poster child" for stormwater management. To start a specific campaign in your community, educate your local government on the range of LID designs and the range of benefits each can bring. Again, the more you can stress a dual function such as energy reduction, aesthetics, or open space for public use, the more likely officials with little stormwater background will recognize the benefit of these designs.[84]

5 Use Overlay Districts to Add New Requirements to Existing Zoning Districts

In addition to basic zoning requirements for a designated district, communities can add layers of restrictions, or "overlay" requirements, that only apply to specific areas or features within the district. Overlay districts maintain the underlying uniform zoning district, but add more restrictive standards in specific areas. For example, a residential subdivision will likely fall within one basic zoning district (R-1 or R-2…etc.) which sets basic standards for, among others, the type of uses, setbacks, and road widths. Overlay districts allow the community to

NEWSFLASH:

Builders Associations Praise Low Impact Development

Like many areas of green design, developers and builders associations have realized the financial benefits of Low Impact Development (LID). For example, Matt Moroney, the Executive Director of the Metropolitan Builders Association (MBA) in Milwaukee, Wisconsin, touted the "increased cost-effectiveness" of LID in the State's leading construction journal. "For the developer, LID design can reduce storm-water management costs. . . [as well as] costs associated with land clearing and grading" said Moroney. "LID can be a cost-effective way to do development for municipalities too by reducing infrastructure and maintenance costs for gutters, curbs, streets, sidewalks and storm sewers."

In fact, MBA is echoing a sentiment that has been widely-advocated by the National Association of Home Builders (NAHB). According to multiple NAHB publications, the reduced costs alone are enough to justify LID designs. However, for both MBA and NAHB, local acceptance of LID remains a significant barrier. As NAHB's Rich Dooley wrote in Professional Builder Magazine, "Many local codes, zoning regulations, parking requirements and street standards were developed before water-quality and storm-water management concerns emerged and thus might be at odds with LID practices." In the end, Dooley believes, "cost factors might help drive change in this area."

SOURCES: Moroney, Matt, "Commentary: Low-Impact Development Workshop Set," The Daily Reporter September 9, 2004; Dooley, Rich, "Low impact, high rewards; Building Technology; low- impact development strategies; rainwater runoff management" Professional Builder No. 11, Vol. 68; Pg. 53 November 1, 2003

> A mature urban forested area can reduce a drainage basin's peak stormwater runoff by 10 to 20 percent.

apply additional standards for the lots that are within a certain distance of a natural infiltration area or water body.

Overlay districts are often used to promote development in compact districts, increase riparian and groundwater recharge buffers, and promote growth near mass transportation stations.

Example:

- University of Wisconsin Extension Review of Overlay District Options: http://cleanwater.uwex.edu/plan/overlay.htm;
- Urban Coastal Greenway requirements (Rhode Island)—requires 100% on-site stormwater management on redevelopment sites using LID techniques to the maximum extent practicable and sets clear design benchmarks (15% vegetation, LID techniques, 80% TSS reduction) (http://seagrant.gso.uri.edu/metrosamp/ucg_manual/index.html--requires

6 Create Standards to Improve Stormwater Management in Developed Areas

Require Basic Best Management Practices (BMPs)

Some LID designs and Best Management Practices (BMPs) can be universally adopted, regardless of site constraints and financial concerns. For example, downspout rain gardens (potted or in-ground) and rain barrels are very inexpensive, yet can significantly reduce the amount of stormwater that is discharged from the roof to the storm sewer. In addition to rain gardens and barrels, communities can consider a wide-range of LID designs set forth in EPA's "National Menu for Best Management Practices" and find designs that should be community staples.[85]

Integrate LID into Existing Landscaping Requirements.

Most communities already have landscaping requirements in their zoning codes, specifically surrounding parking areas. Existing landscaped areas can be retrofitted to function as a swale and reduce stormwater.

Promote Tree Planting.

A mature urban forested area can reduce a drainage basin's peak stormwater runoff by 10-20 percent.[86] Beyond the stormwater benefits, tree cover benefits area aesthetics, temperature, energy use, and property values. Tree planting is an inexpensive, long-term investment in the area that should receive widespread support. If your community supports a tree planting campaign, make sure the trees are located in areas that absorb runoff.

7 Address Storage/Use of Pollutants that Contact Stormwater

While many of the local initiatives and code alterations address the creation of stormwater runoff, some runoff is inevitable. Therefore, it is important to limit the amount of pollutants that may be carried away from a site. Local ordinances can be used to restrict the type of pollutants that are stored or used on a site or the way in which pollutants are stored or used.

Example: In 2005, Dane County, WI passed an ordinance that prohibited the sale of fertilizer containing phosphorus except for turf management (with a nutrient plan) and to establish a "first seeding" after construction. The ban withstood a federal lawsuit and remains an example of local action to reduce pollutant loading in a watershed.[87]

8 Create and Protect Buffers for Water Resources

Create Conservation and Preservation Zoning Districts.

As discussed in earlier chapters, communities can set strict zoning controls on vital natural areas of a city. Using preservation or conservation overlay districts, your community can eliminate all development within a certain distance of a water body, or take other steps to reduce impervious surfaces and retain vegetative

cover within a buffer area. Additionally, communities use preservation overlay districts around vital resources like groundwater supply areas.[88]

Buy Easements and Purchase Development Rights from Riparian Landowners.

Despite the clear legal support for exercising zoning powers, many community members are leery of government regulations of private property. For those communities, land trusts could provide a great solution. Traditionally, non-profit land trusts or governments purchase development rights and place them in a trust for preservation. Additionally, land trusts and governments can regulate land use by purchasing a "negative easement" on the property that restricts the landowner's development choices, use of fertilizers, water usage, and other actions that affect water quality.[89] Again, it is important to know that these same regulations can be imposed through zoning code alterations with little public expense. Nevertheless, if such efforts are not supported, look to private market solutions.

Promote Downtown Parks in Floodplain Areas.

Well-placed community parks benefit the community by creating open space for recreation and increasing nearby property values. By placing a park in a floodplain, your community creates the added benefit of dramatically reducing flood damage and providing a buffer for the adjacent river or stream. Finally, the adjacent water body will offer a great backdrop for the public park.

9 Require LID Designs for Municipal Projects

Providing examples of LID projects can help persuade private developers and landowners to incorporate these techniques. Local ordinances requiring all municipal buildings to use LID designs or retain pre-development hydrology can provide these examples and open doors for similar designs from private developers. Beyond setting an example, many communities have chosen to incorporate green design features into municipal building projects to reduce energy and utility costs. Additionally, public right-of-ways, streets, alleys, community gardens and parks all present opportunities for reducing community-wide runoff using LID. Finally, many government officials seem more likely to take action that requires governmental reform first. Municipal projects allow the government to promote a green image and increase efficiency, while pushing private developers to follow their lead voluntarily.

Example: Portland, OR, uses their "Green Streets" Program to integrate Low Impact Development into municipal infrastructure projects. The Green Streets Program reduces stormwater pollution from city streets and shows private developers the economic, environmental, and aesthetic benefits of green infrastructure.[91]

TIP When setting buffer zones, make sure the size and vegetative cover is adequate to reduce runoff pollution. EPA studies and standards can provide an excellent source of support for the actual buffer setback that you choose in your ordinances.[90]

10 Connect Zoning Decisions to a Comprehensive Plan

Comprehensive planning is the key to organized growth and resource protection. Your community should create a comprehensive plan and, most importantly, require that all zoning decisions comply with the goals of the comprehensive plan.

CHAPTER FOUR

KEY COMPONENTS OF YOUR ORDINANCE

Once you have identified what measures your community should take, it is important to decide how your community should take action. For example, policy changes such as mass transit funding and fix-it-first priorities may be informally implemented by the Mayor or County Administrator's office or by a formal resolution from the local council. Either way, these general policy initiatives do not heavily rely on formal legislative action.

Zoning code amendments and city-wide prohibitions, however, must be added to the municipal code by adopting a formal ordinance. Unlike a policy suggestion, the form and substance of the ordinance is very important. Without proper components the ordinance may be ineffective, overbearing, or illegal. Community members can make sure their city's regulations reflect the community's vision by reading through proposed ordinances and analyzing the following components:[92]

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Intent

Most ordinances start with a statement of intent or purpose. This statement should clearly identify the overall objective that is driving the new requirements. When applied, ordinance requirements are generally interpreted in a manner that advances this overall intent.[93] Therefore, when preparing a statement of intent, take time to think of ways that the ordinance could be misinterpreted and design the statement to correct these potential misinterpretations.

Additionally, your "Intent" section may be supplemented with a "Findings and Determinations" section, which sets forth any facts and concerns that the council agreed on before passing the ordinance. However, these sections are not required and may make some local officials uneasy if they are unfamiliar with the topic. When in doubt, stick with a simple statement of intent:

EXAMPLE:

- The purpose of this subchapter is to set forth the minimum requirements for construction site erosion control and stormwater management that will diminish threats to public health, safety, public and private property and natural resources of Sampleville.
- This chapter is intended to regulate construc-

GARY BELAN

tion site erosion and stormwater runoff in order to accomplish the following objectives:

(a) Retain pre-development hydrology
(b) Minimize pollutant loading to surface and groundwater supplies
(c) Promote energy-efficient, low impact development designs

Scope

Ordinances must clearly identify the land uses, actions, or geographical areas that are subject to the ordinance requirements.

EXAMPLE:
Scope of Applicability: All provisions of this chapter shall apply to any of the following activities in [Jurisdiction]:

- Land disturbing activities involving greater than 4,000 square feet[94]
- Activities affecting land within 200 feet of a riparian shoreline

EXAMPLE: The regulations of this chapter apply to all new development and redevelopment plans approved after June 6, 2004, including those that include construction of any principal building, redevelopment and rehabilitation that results in an increase in a principal building's floor area or building footprint, any increase in size of an off-street parking area, and any change in use that changes the treatment of the premises under this chapter.[95]

Authority

When exercising local zoning powers, local governments are really exercising state powers that have been delegated to local governments by state statute.[96] To clearly connect your proposed ordinance to the underlying state statute, clearly state the authority with which the local government is taking action:

EXAMPLE: This subchapter is adopted by the Sampleville County Board under the authority of sec. XXXX of the [State] Statutes.

Administration

Ordinances should delegate authority to the governing body that is responsible for implementing and enforcing the ordinance. For example, ordinances that require Planning Commission review and approval should give the Planning Commission the authority to review, alter, deny, and approve plans that are submitted.

EXAMPLE:[97]
Delegation of Authority. The City Engineer

Lack of rules or enforcement on erosion control is a serious issue for smaller streams and rivers.

shall have all authority necessary to administer, approve plans and enforce the provisions of this ordinance consistent with [State Zoning Laws].

Definitions

Many court cases have revolved around the meaning of individual words and phrases in ordinances. To avoid confusion and attempts to circumvent requirements, make sure you clearly define all terms that may be misinterpreted. Often, local review boards and higher courts will first look to the plain language of an ordinance requirement, including definitions, when interpreting an ordinance. While your intent may be clear, a poorly written or non-existent definition may lead to an unfavorable interpretation.

Example:[98] Connected imperviousness means an impervious surface that is directly connected to a separate storm sewer or water of the state via an impervious flow path.

Clear Requirements

If the proposed ordinance requires or prohibits certain actions, make sure its language stresses the mandatory nature of the requirements or standards. Generally, terms like “shall” or “must” denote mandatory standards; terms like “may” or “should” denote advisory requirements that may be ignored.

Example:

- Surface Lot Prohibition. Within the Surface Parking Lot Ban Districts, one-level surface parking lots are strictly prohibited, and existing one-level surface parking lots may not be increased in size.
- Pervious pavers. Applicants may reduce impervious surface by using pervious surfaces for peak parking areas if such design feature is presented and approved by the Plan Commission.

Example of Tense and Usage Clarification Section:[99]

Tenses and Usage.

- Words used in the singular include the plural. The reverse is also true.
- Words used in the present tense include the future tense. The reverse is also true.
- The words "must," "will," "shall" and "may not" are mandatory.
- When used with numbers, "up to x," "not more than x" and "a maximum of x" all include x.

Exemptions

If certain land uses, activities, or landowners are exempt from the ordinance requirements, make sure that these exemptions are listed. Both the regulated community and the public will benefit from a clearly-worded, narrowly-defined exemptions section that removes confusion about who is, and is not, regulated. Finally, make sure the exemptions are clearly explained and necessary to avoid loopholes.

For stormwater regulations, the traditional exemptions include agricultural land uses and transportation projects that are covered by separate local or state requirements. Do not hesitate to question each exemption and clearly identify the reasons for removing requirements for these uses.

Variance Standards

Variances are a vital yet worrisome side component of zoning ordinances. Variances allow certain applicants to avoid requirements when such requirements impose a unique and unnecessary hardship. Communities rely on variances to maintain some flexibility and avoid “taking” private property through overbearing regulations.[100] This flexibility ultimately protects the local ordinance from constitutional challenges and political opposition.

However, variances are often too broad and over used to allow the regulated community to avoid key requirements. By allowing some developers to sneak past regulations, local governments dilute the intent of the ordinance and create an inequitable regulatory environment. To avoid misuse, the variance section should narrowly define the scope of “hardship” that will be considered and the remaining requirements that apply once a variance is approved. Generally

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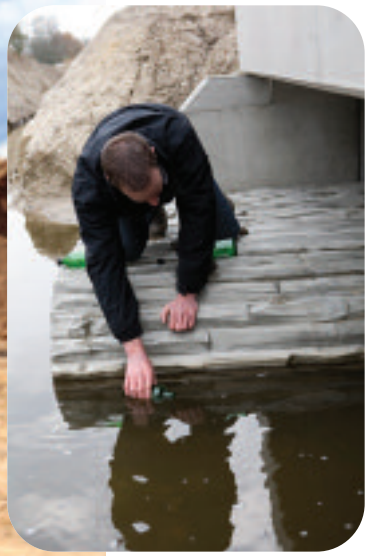

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variances are limited to situations where unique physical conditions make compliance with specific terms unreasonable and non-compliance would not affect the ordinance's overall intent. Your ordinance should include a specific variance section that is well-tailored to allow flexibility, yet limits its use.

EXAMPLE:

- No variance shall be granted unless applicant demonstrates and the director and the county conservationist find that all of the following conditions are present:

  (a) Enforcement of the standards set forth in this ordinance will result in unnecessary hardship to the landowner;
  (b) The hardship is due to exceptional physical conditions unique to the property; and
  (c) Granting the variance will not adversely affect the public health, safety or welfare, nor be contrary to the spirit, purpose and intent of this ordinance.

- If all of the conditions set forth in sub. (1) are met, a variance may only be granted to the minimum extent necessary to afford relief from unnecessary hardship, with primary consideration to water quality and impact to downstream conditions.

Easement for Inspections and Emergency Maintenance

Many stormwater requirements require on-going oversight by local inspectors. Additionally, in cases where failed stormwater management designs create an immediate threat, the local government needs to take action without prior approval from the landowner. In both situations, government inspectors and maintenance crews need authority to enter property at any time. Often this authority is in the form of a required easement agreement between the landowner and the local government. These easements should be recorded with the property deed prior to issuance of a building permit by the local government.

EXAMPLE: Stormwater management easements shall be provided by the property owner: (1) access for facility inspections and maintenance, or (2) preservation of stormwater runoff conveyance, infiltration, and detention areas and facilities, including flood routes for the 100-year storm event. The purpose of the easement shall be specified in the maintenance agreement signed by the property owner.[101]

ADDITIONAL REFERENCES: EPA provides additional examples of easement documents.[102]

Oversight by by local inspectors and monitoring of water quality is essential to ensuring proper stormwater management.

Long-term Maintenance Agreement with the City

Commercial, industrial, and residential landowners should enter a formal agreement with the local government to take all necessary steps to maintain stormwater management designs and practices. The maintenance agreement should identify the person (i.e. landowner, business manager, or condominium manager) that is responsible for maintenance, include a minimum schedule for landowner inspections and repairs, and set clear functional standards.

Finally, the long-term maintenance agreement should be attached to the land deed as a "restrictive covenant," or set of restrictions that applied to the land regardless of the owner. All successive owners of the land will be required to comply with the terms of the agreement.

EXAMPLE: A maintenance plan and schedule for all permanent stormwater management practices, as recorded in a formal affidavit, must be filed with the deed before approval.

Performance Bond

If the landowner's activities pose a significant threat to property or water resources, the ordinance may require a performance bond that will be returned once the activity is complete. Most commonly, performance bonds are used to assure construction site erosion protection and are returned once construction is complete.

EXAMPLE: Applicants proposing subdivision plats, road construction projects, or other developments identified by the [Authorized official] with a high potential for soil erosion shall be required to post a cash escrow, letter of credit, or other acceptable form of performance security in an amount determined by the [Authorized official]. The security deposit will be returned when a certification by an independent, registered civil engineer states that the plan is complete and designed according to the model.

Enforcement

Ordinance requirements are only as good as the monitoring and penalties used to enforcement them. Make sure the ordinance includes clear monitoring requirements and strict penalties for lack of compliance. Generally, a "stop work order," which requires developers to stop construction or operation until the violations are corrected is the best way to spur compliance. However, without a monetary penalty, developers and contractors may simply wait until a stop work order is issued to begin compliance. Therefore, a combination of both measures is a common approach.

EXAMPLE:[103]

- **Stop work order.** Whenever the local approval authority finds any noncompliance with the provisions of this ordinance, the local approval authority shall attempt to communicate with the owner or person performing the work to obtain immediate and voluntary compliance if such person is readily available. If the owner or person performing the work is not readily available, that person refuses to voluntarily comply immediately or the noncompliance presents an immediate threat to downstream water quality, human health or property values, the local approval authority shall post in a conspicuous place on the premises, a stop work order which shall cause all activity not necessary to correct the noncompliance to cease until noncompliance is corrected.
- **Penalties.** Any person, firm, company or corporation who violates or refuses to comply with the provisions of this ordinance shall be subject to a forfeiture of not less than $1,000 per day of violation and all prosecution costs. Each day that a violation exists shall constitute a separate offense.

Appeal

While appeals may not be foremost on your mind, it is important to set forth a clear appellate process in your ordinance. Remember, local governments change over time. The appeals process

provides vital checks and balances to assure both the applicants and the public that the ordinance will be implemented in a manner that furthers its intent.

Without clear language protecting public appeal, courts often narrowly interpret appeals rights to extend only to the applicant. To secure public appeals, make sure you establish broad appellate rights that include members of the public that use and enjoy streams, rivers and other resources affected by the decision.

Example: Any person or persons aggrieved by a decision made by the [Authorized Local Governmental Body] may appeal the matter to the [Local Board of Appeals] which shall be referred to as "The Board" for the purposes of this section. For purposes of this chapter, a person is aggrieved if a decision negatively affects property, financial interests, or natural resources that the person uses and enjoys.

Ordinance Proposal Form

Proposed ordinances are often presented in a slightly different form than the ultimate regulation that is placed in the code. For example, the ordinance proposal will likely have a heading with the ordinance number and title:

Example:

Ordinance #124: Regulating Post-Construction Hydrology

Below the title, ordinances often give the background for the ordinance using a series of "WHEREAS" statements and a "THEREFORE" statement:

Example:

- WHEREAS, the City of Sampleville believes that the health of our surface and groundwater supplies depends on sustainable development of the land,
- WHEREAS, reduction of impervious surface is vital to maintain our natural hydrological cycle,
- THEREFORE, be it ordained by the City of Sampleville that the Municipal Code of the City of Sampleville is amended to include sections AA-ZZ of the following ordinance:

After the "THEREFORE" statement, you can launch into the specific sections of the ordinance.

CHAPTER FIVE

MOBILIZING COMMUNITY SUPPORT

Perhaps the most difficult and most important aspect of your work will be convincing the community and local government to take action. Your public presentation, supporting arguments, and ability to compromise will make or break your proposal. Therefore, take time to prepare yourself for possible questions, reactions, skepticism, and indifference. When preparing, remember one key principle: You are not trying to convince the community to support your proposal, but rather to make the proposal their own. To bring the community together, you will need to be open to outside concerns and make adjustments accordingly.

Know Your Audience

Before bringing your proposal to local businesses, community members, and local officials, think of reasons why they would support or oppose the proposed measures. How are their interests affected by the proposal? Are there specific benefits, stormwater-related or otherwise, that would be particularly attractive to them? By taking time to study their interests, you can put your proposal in the best position to gain support.

Bring Businesses on Board Early

It is vital to have calm discussions with business leaders about the benefits of your proposed ordinance or policy. When businesses are surprised by a zoning ordinance proposal, they often assume it is against their interests and react with immediate opposition. By meeting early and building trust, you can begin to address their legitimate concerns before your local officials hear the proposal, Hopefully, businesses will see long-term benefits and offer their support.

Prepare Clear, Defensible Talking Points

Persuasive arguments are not improvised. Talking points are a key element of any political initiative, whether large or small. Together with your fellow supporters you can craft a set of clear, simple arguments that highlight key benefits, target known concerns, and resonate with people of all backgrounds and persuasions. Additionally, talking points should be repeated consistently and regularly to make sure they

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reach the largest audience possible. While the talking points should be tailored to your community, there are certain themes and supporting arguments that are universal:

Stormwater pollution reduction is necessary to protect vital resources

Most community members join together to protect public health and vital local resources. Unfortunately, our discussion of "watershed" protection often obscures the direct connection between our stormwater management and our long-term supply of clean drinking water and public recreation areas. To garner widespread support, you should make sure this connection is clearly explained to the public.

Stormwater management measures are good for the economy

Viewing economics alone, there are clear reasons to conserve land, promote compact and infill development, and adopt LID designs:

❖ **Promotes downtown redevelopment.** Zoning codes that promote compact development ultimately promote downtown revitalization and redevelopment. Communities that are trying to preserve downtown districts should create design standards that steer businesses and residents away from big-box highway districts and toward compact commercial districts. In the end, a vibrant downtown commercial area and tax base is in everyone's interests.

❖ **Protects property values.** According to a recent Gallup survey, urban residents are more drawn to a city's quality of life--including overall aesthetic and physical beauty, air and water quality, great open space, and authentic neighborhoods--than any other feature.[104] While local governments can attract people back to cities by touting safety, convenience, and amenities, it is the livability of these areas that will sustain downtown populations. Green roofs, rain gardens, compact pedestrian-friendly developments, and open natural areas are long-term investments to protect property values and tax bases.[105]

PATRICIA PENNELL

Rain gardens can help improve property values and manage stormwater

❖ **Conserves infrastructure expenditures**. Urban sprawl drains tax dollars by creating and maintaining unnecessary infrastructure with little public benefit per dollar spent. If your community required compact development districts and infill growth it would be able to provide well-maintained infrastructure and services to far more people, far more efficiently.[106]

❖ **Provides regulatory certainty and quick regulatory turnaround.** To meet Clean Water Act urban stormwater requirements, many communities are taking steps to reduce stormwater pollution to the "maximum extent practicable."[107] This vague standard creates an ever-changing regulatory environment for developers. In many cases, cities discuss practicable stormwater reductions on a case-by-case basis, making it difficult for developers to accurately estimate the costs of development before committing to the plan.

Often, developers will accept more restrictive standards in order to avoid this uncertainty and lengthy review time. For example, in the City of Chicago, Mayor Daley's decision to shorten review times for proposals with green designs has led to the voluntary construction of over mil-

lion square feet of green roofs.

By setting clear zoning standards, your community allows developers to "value engineer" the design to balance out extra design costs and avoid costs associated with regulatory delay. Instead of guessing what design will impress Planning Commissioners, developers can walk into permit hearings with a design they know will meet community standards. For all of these reasons, clear zoning standards should entice future development.

❖ **Creates viable commercial districts.** Compact commercial districts, whether downtown or in traditional neighborhood districts, help sustain individual businesses. When consumers of a wide variety of goods walk through the same area, they are more likely to continue shopping at other neighboring businesses (called "crossover business"). The farther businesses spread out, the less crossover business is created. Businesses look for communities, not islands. By creating and sustaining compact commercial districts, your community is opening the door to new businesses and long-term economic growth.

❖ **Saves costs associated with flooding and declining public health.** As our water resources become polluted, public health starts to decline. Declining public health imposes heavy costs on society. As always, preventative measures like green infrastructure and LID are far less expensive than treatment.[108]

Additionally, by mismanaging stormwater, our communities have increased the frequency and severity of flash flooding. Adjusted for inflation, communities are now spending five times more money every year on flood damage than they did 50 years ago.[109] Costs of flood insurance are straining individual budgets. By reducing the volume of stormwater we discharge, we will reduce the costs associated with flooding.

CASE IN POINT

Economic Benefits of Stormwater Management

In the suburbs of St. Louis, MO, Alberici Constructors, a 90-year old construction and contracting company, is making a statement about Low Impact Development (LID). Instead of paving over undeveloped land, the company located its new, 110,000 square-foot corporate headquarters on the site of an existing, abandoned industrial site. To minimize on-site impacts, Alberici's headquarters replaced surface parking lots with a covered, two-story parking structure and restored natural areas of the property, including wetlands, swales, and forested buffers. Finally, Alberici designed a rooftop stormwater recovery system, which collects rainfall (about 60% of the site's stormwater) in a 38,000 gallon cistern. The stored stormwater is connected to the building's plumbing and serves as the source of water for all urinals and non-potable uses. In the end, the site will have zero stormwater discharge from the building site.

For Alberici, the use of stormwater for non-potable uses makes economic sense: The building's design saves an estimated 294,000 gallons of water per year, cutting Alberici's water bill by nearly 70%.

SOURCE: Hale, Tom, "Alberici's Innovative, Green Showcase, "Construction Digest" July 11, 2004 www.acppubs.com/article/CA439558.html

❖ **LID designs can save development costs.** Many soft path/LID methods create cost savings for developers. For example, instead of traditional parking lot storm drains, the State of Oregon's Museum of Science and Industry used vegetated swales to absorb stormwater from 14 acres of impervious surface. In addition to the environmental benefits, the project saved the developers $78,000 when compared to their original parking lot design.[110]

Generally, bioretention areas can cost as little as $1.25/sq. ft., depending on size and design, and reduce sediments and heavy metals (zinc, copper, lead) by up to 95%.[111] Rain barrels, which range from $40-250, can reuse up to 10 % of a 1-inch rainfall and reduce water bills. Remind your community that there are inexpensive, reasonable requirements that have significant impacts.

Stormwater pollution degrades local tradition.

A declining river is often an indicator of a declining community and dying tradition. Beyond their financial value, many of these water bodies are part of our communities' way-of-life. Water resources are often gathering areas for picnics, fishing, and other traditions that are valued by young and old, conservatives and liberals. Our common bond to tradition has led many communities to come together and preserve old bridges and other landmarks. Make sure your community recognizes that your local river also embodies a tradition that needs to be preserved.

Federal and state agencies agree: Local regulations are necessary to address stormwater pollution.

EPA considers local ordinances a vital part of the Phase II CWA requirements for urban stormwater.[112] In fact, communities that have a regulated municipal separate storm sewer system (MS4), are generally required to adopt local ordinances to reduce stormwater from new construction.[113] If your community is required to adopt some sort of ordinance, take the opportunity to gain significant benefits across the board. Even if your community's storm sewer system is not regulated, EPA's guidance regarding local ordinances provides a clear endorsement of your local efforts.[114]

Address Myths

When preparing your talking points, specifically focus on classic myths and arguments that have derailed local initiatives in other communities:

1. Myth: Additional regulations create a "new" set of costs for developers.
As discussed above, most LID techniques actually reduce long-term costs for developers. In many cases, developers are only wary of LID designs because both the developers and clients are more familiar with traditional designs and materials. Once familiar with LID approaches, both developers and clients generally see a win-win situation.

Nevertheless, in some cases, developers may be required to spend more money to meet stricter requirements. It is important to stress to the community and government body that these costs are not being "created" by the council. Increased stormwater pollution has always been a cost of development, but has been traditionally pushed on to the public in the form of resource degradation and storm sewer upgrades. By requiring developers to properly manage increased stormwater, the community is simply placing those costs back on the people that create them and benefit from the underlying development.

2. Myth: Smart growth and LID principles are new, untested concepts.
The principles behind most of the stormwater management strategies discussed in this tool-kit have been accepted for hundreds of years. Smart growth measures merely recommit your community to urban planning principles like compact development, mixed use districts, and mass transportation that built most of our major cities. Our original large-scale department stores were housed in multi-story commercial buildings that were linked to parking structures in downtown areas. Moreover, many LID and soft path

designs such as cisterns, rain barrels, gravel driveways, and narrow roads were common in older developments.[115]

Your community should feel comfortable moving back to these proven principles and away from the strip mall philosophy that has created a flood of issues.

Generate "Common Sense" Discussion Questions and Suggested Answers

In addition to your talking points, it is helpful to stimulate support with some common sense discussion points. For example, most of us have a general aversion to unnecessary waste. Often a discussion that centers on common sense values we all have (i.e. waste is bad, efficiency is good) helps connect people with the underlying principles of your stormwater initiative. By raising questions, you allow the community to come to the realization that these measures are beneficial instead of feeling like they are giving into your realization.

Some example discussion questions include:

- Why are we spending our hard-earned money to use clean drinking water to water our lawns and flush toilets while also spending money to build stormwater detention ponds? Shouldn't we try to keep the stormwater on site and reduce our water use?
- Why are we wasting gas driving to one-story buildings, surface parking lots, and highway commercial districts that are degrading our environment? In the past, we built multi-story retail buildings with shared structure lots and placed them in downtown development areas. These designs allow us to save gas, reduce stormwater pollution, and conserve tax expenditures on infrastructure and services.

Conclusion

Most likely, your proposal represents a "win-win" for your community that promotes compact development, reduces long-term community expenditures, and reduces stormwater pollution. However, without the proper approach, this message may be lost. By spending time up front, dispelling myths, and discussing efficient strategies for protecting valuable resources, your community will be far more receptive to the new regulations and policies that are vital to local resource protection.

CASE IN POINT

Greening Big-Box Development

Across the U.S., large "big-box" retailers are shifting to more compact and efficient designs. In cities like Chicago, Target, Home Depot, and other retailers are using multi-level designs, underground parking, and green roofs to reduce impervious surfaces. In suburbs like Westchester County, New York, big-box retailers are putting shared parking structures on their roofs to avoid surface lots. These designs can be found in large and small cities from southern California to suburbs of Atlanta, Georgia. By reducing the size of big-box development, communities are able to avoid large volumes of polluted stormwater and maintain compact commercial areas that join, rather than replace, existing downtown areas.

Sources: Campbell, Keith, "Breaking Down the Big Box," Multifamily Trends, Urban Land Institute July/August 2007 www.uli.org/AM/Template.cfm?Section=Home&CONTENTID=100055&TEMPLATE=/CM/ContentDisplay.cfm; Embrey, Alison, "Reinventing the Box," DDI Magazine March 1, 2006. www.ddimagazine.com/displayanddesignideas/search/article_display.jsp?vnu_content_id=1002076051

APPENDIX

CASE STUDIES

Every municipal code contains both positive stormwater management practices and areas to improve. To aid your efforts to assess your community's positive practices and areas for improvement, we provide the following two case studies: Toledo, Ohio and Madison, Wisconsin.

Both Toledo and Madison were selected because they offer examples of both progressive, positive code requirements and areas for improvement. While some of the examples offered throughout this tool-kit come from cities on the forefront of stormwater management, the following two case studies show us that similar progress is being made across the country. More importantly, the following case studies provide an example of the type of on-going analysis that creates highly effective and efficient local solutions to stormwater pollution.

CASE STUDY: CITY OF TOLEDO, OHIO

CITY OF TOLEDO, DIVISION OF ENVIRONMENTAL SERVICES

Toledo sits on the Maumee River.

The city of Toledo, Ohio has a great asset in the Maumee River. They are trying to better manage stormwater to the river through rain gardens, like this one at the city's Division of Environmental Services.

CITY OF TOLEDO, DIVISION OF ENVIRONMENTAL SER

Performance-based Standards

POSITIVE STEPS

- ✓ Recognizes the intent to address quality and quantity of stormwater.[116]
- ✓ Regional Stormwater BMP Guide sets performance standards for each site.[117]

AREAS TO IMPROVE

- ✓ Add mandatory performance standards, instead of relying only on a requirement to use proper Best Management Practices.[118]
- ✓ Create clear standards so developers and public understand what level of performance is expected.

Additional Measures to Reduce Impervious Surface

POSITIVE STEPS

- ✓ Using overlay districts downtown to set maximum building set-backs and individual footprints for large retail buildings
- ✓ Prohibiting surface parking lots are prohibited in the downtown district.[119]
- ✓ Setting a maximum parking each site. (150% of minimum parking) to reduce unnecessary impervious surfaces.[120]
- ✓ Exempting downtown retailers from off-street parking requirements to increase density and promote mass transit.[121]
- ✓ Reducing minimum parking requirements by 20% near transit stops.[122]

AREAS TO IMPROVE

- ✓ Establish clear square foot cap on impervious area and apply the cap to all buildings.
- ✓ Remove off-street parking minimums for new construction outside of the downtown area.[123]
- ✓ Provide incentives for shared parking, instead of merely allowing shared parking.
- ✓ Shift parking lot landscaping requirements to create stormwater retention areas (i.e. mandatory tree island requirement for large surface parking lots could use rain garden plants and absorb runoff).[124]

True Cost Accounting and Market Incentives

POSITIVE STEPS

✓ Using stormwater utility fees, the City requires landowners to internalize costs associated with off-site stormwater pollution. Fee is based on the area of impervious surface. stops.[125]

AREAS TO IMPROVE

✓ Increase rate (i.e. cost only $12 per month to create an additional 10,000 square feet of impervious area).

✓ Remove rate "adjustments" for minor LID improvements. Instead, reduce fee based on the percentage of total stormwater volume that is reduced.[126]

Removing Regulatory Barriers

POSITIVE STEPS

✓ Allows pervious or lawn parking areas if the spaces are "used only intermittently, either for special events or for seasonal peaks or overflows in patronage of the principal use or uses."[127]

✓ Stormwater is not required to be drained into the storm sewer system.[128]

AREAS TO IMPROVE

✓ Clarify requirements for receiving Director approval to include pervious parking. Without certainty that the plans will be approved developers have trouble estimating overall costs and are less likely to choose this design.[129]

✓ Remove requirement that all parking lots "be graded to drain all surface water towards the interior of the parking lot."[130]

Address Pollutant Use and Storage

POSITIVE STEPS

✓ Regional Stormwater Management Standards Manual address pollutant use and storage.

AREAS TO IMPROVE

✓ Establish clear storage and use standards in municipal code. Need greater certainty regarding required practices.

CASE STUDY: CITY OF MADISON, WISCONSIN

The city of Madison, Wisconsin sits between Lake Mendota and Lake Monona.

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Performance-based Standards

POSITIVE STEPS

✓ Includes the following performance-based requirements:

✓ Remove 80% of stormwater sediment (as compared to no controls)[131]

✓ Treat the first 0.5 inches of runoff using the best oil and grease removal technology available[132]

✓ Infiltrate 90% (residential) or 60% (commercial) of the water that was infiltrating on site before construction.[133]

AREAS TO IMPROVE

✓ Require sites to maintain pre-development hydrology, including volume and temperature (for greenfield development).

✓ RInclude secondary, prescriptive requirements for sites that receive variances from the existing performance standards (i.e. require rain gardens, rain barrels or other universal BMPs)

Additional Measures to Reduce Impervious Surface

POSITIVE STEPS

✓ Limits all retail building footprints to 100,000 square feet, with possible exemptions for designs with green roofs, underground or structured parking or other green designs.[134]

✓ For large retailers (> 40,000 sq. ft.), sets maximum setback (20 feet) from busiest pedestrian walkway

✓ If parking > 60% over the minimum, must have mitigating measures, such as bioswales, structured parking, or additional landscaping.[135]

✓ Requires "Traffic Demand Management" measures from businesses with > 100 employees (i.e. employer-subsidized bus passes; subsidies for car sharing).[136]

✓ Prohibits impervious surface within 30-75 feet of a water resource (depends on the resource).[137]

AREAS TO IMPROVE

✓ Shift to impervious surface cap, including both building footprint and surface parking.

✓ Reduce impervious surface limits in other non-commercial districts (i.e. sites in the Research and Development District may be up to 85% impervious.)[138]

✓ Set maximum limit for surface parking.

✓ Change shared parking requirements to allow individual sites to reduce minimum requirements.[139]

✓ Use existing landscape requirements to increase stormwater retention (i.e. parking lot landscaping must be comprised of bioswales and rain gardens and used to absorb stormwater from adjacent stalls).[140]

True Cost Accounting and Market Incentives

POSITIVE STEPS

✓ Landowners area required to internalize some costs associated with new impervious surfaces:[141]

✓ $7.44 per 1,000 square feet of Impervious Area, paid every 6 months.

✓ $0.52 per 1,000 square feet of Pervious Area.

AREAS TO IMPROVE

✓ Recognize distinction between connected and disconnected impervious area

✓ Increase rates (i.e. removing 10,000 square feet of impervious surface will only save developers $12 per month under current rates).

Removing Regulatory Barriers

POSITIVE STEPS

✓ Allows developers to avoid minimum parking requirements.[142]

✓ Established an Urban Design Overlay district which expressly encourages porous pavement, rain gardens and other LID designs.[143]

AREAS TO IMPROVE

✓ Revise storm sewer connection requirements to recognize voluntary on-site stormwater retention.[144]

✓ Remove requirement that developers use "bituminous or Portland cement concrete pavement or paving brick surface in accordance with City of Madison standards and specifications" for all parking surfaces.[145]

Address Pollutant Use and Storage

POSITIVE STEPS

✓ Prohibits use or sale of phosphorus-based fertilizers; controls areas of application for other fertilizers.[146]

AREAS TO IMPROVE

✓ Address storage of coal, salt and other pollutants found draining into storm sewers.

ENDNOTES

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17 *See* Michigan Environmental Council, *Smart Growth for Clean Water: Innovative Strategies for NPDES Phase II Stormwater Management in Michigan*, (2005)

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68 For example, sprawling surface parking lots are approximately 5 times cheaper per space than structure lots but also create much greater impact on the environment. *See* Victoria Traffic Policy Institute, "Transportation Cost Benefit Analysis." Chapter 5, p. 5.4-1, (December 2006), www.vtpi.org/tca/; *See also* State of Maryland Governor's Office of Smart Growth, *supra* note 58

69 These fees are called "exactions" and are considered constitutional if there is a clear connection or "nexus" to the site's impact (stormwater pollution) and advances a rational public interest (reduces stormwater pollution). *See Nolan v. California Coastal Commission* 483 U.S. 825, 107 S. Ct. 3141 (1987); *Dolan v. City of Tigard*, 512 U.S. 374, 114 S. Ct. 2309 (1994).

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81 City of Austin, TX Municipal Code § 25-3 www.amlegal.com/nxt/gateway.dll/Texas/austin/thecodeofthecityofaustintexas?f=templates$fn=default.htm$3.0$vid=amlegal:austin_tx$anc;

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83 American Planning Association, *Model Mixed Use Zoning District Ordinance*, www.planning.org/smartgrowthcodes/pdf/section41.pdf

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85 EPA, National Menu of Stormwater Best Management Practices, cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm

86 American Rivers, *supra* note 7 at 38.

87 County of Dane, WI Code of Ordinances § 80.07; *See also*, Dane County Office of Lakes and Watersheds, *Phosphorus Control in Dane County*, www.danewaters.com/management/phosphorus.aspx

88 Stormwater Center, *Source Water Protection Ordinances*, www.stormwatercenter.net/Model%20Ordinances/Source_Water_Protection/source_water_intro.htm

89 *See* North Carolina Coastal Land Trust, *Conservation and Historical Preservation Easements*, 2nd Edition 2004 www.coastallandtrust.org/media/images/homepage/EasemFNL.pdf

90 U.S. EPA, *Riparian Buffer Width, Vegetative Cover, and Nitrogen Removal Effectiveness*, (October 2005) www.epa.gov/nrmrl/pubs/600R05118/600R05118.pdf

91 City of Portland Bureau of Environmental Services, "Portland Green Streets Program" www.portlandonline.com/BES/index.cfm?c=44407

92 The following discussion of ordinance components is meant to help community members to take an active role in the legislative process. However, community members will generally not be required to draft a pro-posed ordinance. While it is always helpful to be familiar with ordinance components, community members should consult with local officials before taking steps to draft a proposed ordinance.

93 *See Weber v. Town of Saukville* 209 Wis. 2d 214, 224; 562 N.W.2d 412 (Wis. 1997); *Edward Kraemer & Sons v. Sauk County Bd. of Adjustment*, 83 Wis. 2d 1; 515 N.W.2d 256 (Wis. 1994)

94 Size varies in different areas, but generally is around between 4,000 square feet and 1 acre. For example, in Dane County, WI, stormwater requirements apply to all land disturbing activities involving 4,000 or more square feet; in Seattle, WA, stormwater requirements apply to all land uses, regardless of size or land disturbing activities; however only require pre-construction review for construction that includes additional alteration to 750 or more square feet of land with additional requirements for sites over 9,000 square feet.

95 City of Toledo, OH Municipal Code §1108.0102

96 Richard Briffault, *Our Localism: Part I—The Structure of Local Government*, 90 Colum. L. Rev. 1, 7-8 (1990)

97 *See* City of Madison, WI Municipal Code § 37.12(6)

98 Dane County, WI Code of Ordinances §§ 14.40-14.81

99 *See* City of Toledo, OH Municipal Code § 1101.0602

100 Stedfast, Susan M., *Takings Law Symposium: Regulatory Takings: A Historical Overview and Legal Analysis for Natural Resource Management*, 29 Envtl. L. 881, 910 (1999); *See also* Cohen, Jonathan E., *A Constitutional Safety Valve: The Variance in Zoning and Land-Use Based Environmental Controls*, 22 B.C. Envtl. Aff. L. Rev. 307 (1995)

101 *See* Grand Traverse County, MI Soil Erosion, Sedimentation and Stormwater Runoff Control Ordinance § IV(P)(1), www.co.grand-traverse.mi.us/AssetFactory.aspx?did=693

102 U.S. EPA, "Model Ordinances to Protect Local Resources," www.epa.gov/owow/nps/ordinance/osm4.htm

103 Grand Traverse County, MI Soil Erosion, Sedimentation and Stormwater Runoff Control Ordinance § X(D); City of Madison, WI Municipal Code § 37.12(6) www.municode.com/resources/gateway.asp?pid=50000&sid=49

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105 *See e.g.* U.S. EPA, *Benefit of Water Pollution Control on Property Values*, National Center for Environmental Economics yosemite.epa.gov/ee/epa/eerm.nsf/01df0a28b92492d385256b3a00702efc/3393ab85c2725d0c8525644d0053be34!OpenDocument; State of Maine Bureau of Land and Water Quality, *Economics of Lakes: Dollars and Sense Compilation of Studies on Water Quality and Property Values*, www.maine.gov/dep/blwq/doclake/research.htm#waterclarity;

106 American Planning Association, *Smart Growth Agenda for Illinois*, www.growingsensibly.org/cmapdfs/sgagenda.pdf)

107 33 U.S.C. § 1342(p)(3)(B)(iii).

108 Jackson, Richard J. and Kochtitzky, Chris, *Creating A Healthy Environment: The Impact of the Built Environment on Public Health*, American Journal of Public Health, (September 2003).

109 American Rivers, *supra* note 7 at 3.

110 City of Portland Bureau of Environmental Services, *Stormwater Cycling Site Information*, www.portlandonline.com/bes/index.cfm?a=giheb&c=dgiei

111 American Rivers, *supra* note 7 at 18.

112 U.S. EPA, *Using Smart Growth Techniques as Stormwater Best Management Practices*, (December 2005), www.epa.gov/dced/pdf/sg_stormwater_BMP.pdf

113 Ohio EPA, *Storm Water Program*, OAC Chapter 3745-39, www.epa.state.oh.us/dsw/rules/3745-39.html

114 U.S. EPA, *Using Smart Growth Techniques as Stormwater Best Management Practices*, (December 2005), www.epa.gov/dced/pdf/sg_stormwater_BMP.pdf

115 *See e.g.* Ross, Chuck, *Stormwater Management the Natural Way*, HGTV Pro, www.hgtvpro.com/hpro/dj_construction/article/0,2619,HPRO_20156_5461408,00.html;. Thornton, Richard L., *Harvesting Rainwater*, Beacons Rebellion, (October 19, 2007) www.baconsrebellion.com/Issues07/10-29/Thornton.php

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120 City of Toledo, OH Municipal Code § 1107.0302.

121 City of Toledo, OH Municipal Code § 1107.0201.

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124 City of Toledo, OH Municipal Code § 1108.0204

125 City of Toledo, OH Municipal Code § 943.05

126 City of Toledo, OH Municipal Code § 943.09

127 City of Toledo, OH Municipal Code § 1107.1407(F).

128 City of Toledo, OH Municipal Code § 1745.03.

129 *See* City of Toledo, OH Municipal Code § 1107.1906.

130 City of Toledo, OH Municipal Code § 1107.1906

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132 City of Madison Municipal Code §37.09(3)(b) (FN may waive if "unnecessary").

133 City of Madison Municipal Code §37.09(3)(f)

134 City of Madison Municipal Code §33.24(f)(3)

135 City of Madison Municipal Code §33.24(9)(c)

136 City of Madison Municipal Code §33.24(9)(d)

137 City of Madison Municipal Code §37.09(h)

138 City of Madison Municipal Code §28.10(6)(g)

139 City of Madison Municipal Code §28.11(3)(d)

140 City of Madison Municipal Code §28.11(3)(h)(b)

141 City of Madison Municipal Code § 37.05(4)(a),(f)

142 City of Madison Municipal Code §28.11(2)(c)

143 City of Madison Municipal Code §33.24(14)(d)(8)(b)(4)

144 City of Madison Municipal Code § 37.05(7(b)(2).

145 City of Madison Municipal Code §28.11(3)(h)(a)

146 City of Madison Municipal Code §7.48

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