



Department of Natural
Resources and Environment

08





08

Department of Natural Resources and Environment

POLICIES

- 1 Adopt a green infrastructure approach to open space, habitat and water resources
- 2 Identify natural lands and open space for preservation
- 3 Establish dedicated state funding for land conservation
- 4 Help local governments set and achieve land conservation goals
- 5 Increase funding and support for parks and urban forests
- 6 Integrate smart growth into the state's stormwater program
- 7 Change criteria for water and wastewater infrastructure
- 8 Align the state Total Maximum Daily Loads program with local plans for smart growth
- 9 Encourage zoning code and business licensing to protect and preserve drinking water sources
- 10 Take credit for land use changes under the State Implementation Plan
- 11 Utilize flexibility in federal water and coastal funding programs
- 12 Use smart growth and watershed planning as key features in flood prevention and management programs

How and where communities grow can have as much of an impact on the environment as can hazardous waste cleanups and vehicle mileage standards. Approaches that direct development toward existing communities tend not only to be efficient public investments. They also relieve the pressure to develop in and around the open lands that filter our water, grow our food, protect our wildlife and provide recreation for our citizens.

Encouraging growth in existing communities also supports the cleanup and reuse of brownfields and other degraded areas. And compact neighborhoods make it easier for people to get around in environmentally friendly ways like walking, cycling and using transit..

In this section, we present ways in which natural resource and environmental agencies can support smarter growth outcomes by refocusing their permitting and regulatory programs, modifying funding criteria and strategically using their land development and conservation dollars.

1

Align open space, habitat, and water resource programming under green infrastructure

ACTION

States should align open space, habitat, and water resource programming under green infrastructure. There are multiple benefits of a green infrastructure approach for states. First, green infrastructure allows the integration of inter-related programs such as natural resources management, mapping, parks conservation, floodplain management, and planning. Second, this approach requires an assessment of the full range of economic value and costs related to land conservation. By presenting a comprehensive picture of costs and benefits, including costs avoided, states can serve as stewards of the environment and the state budget at the same time.

The U.S. Environmental Protection Agency has a green infrastructure initiative that better characterizes the ecological services related to open space, parks, and undeveloped land. These services include source water supply and protection, flood control, natural water filtration, carbon sequestration, habitat, and recreation. Green infrastructure applies not only to permanently saved open space at the larger forest and National Park scales, but also to watershed restoration projects and site level use of watershed-friendly landscaping.

While engineers have developed sophisticated economic models and performance specifications for gray infrastructure (e.g., culverts, roads, and utilities), the same level of attention to ecological services has lagged. Historically, the economics of natural resources have focused on extraction, not the services rendered by land in its natural state. However, advances in modeling and successful demonstration projects show that green infrastructure can avoid costly mitigation projects and disaster response when natural areas, wildlife corridors and natural drainage come first in planning and project design.

In addition, the U.S. EPA has issued guidance allowing the use of local and state green infrastructure programs as official water pollution control practices for use within stormwater and combined sewer overflow compliance programs. Finally, while public support for open space preservation has been high historically, there is little understanding of the environmental service the land

provides. Speaking of open space as part of the “public utility system” strengthens the link between open space and the services it provides, such as clean and dependable water supplies, reduced flooding risks, and lower infrastructure costs.

PROCESS

Several states have initiated green infrastructure programs by coordinating forestry, Geographic Information Services (GIS) mapping, and habitat programs. Other programs related to green infrastructure can include watershed plans, aquifer recharge zones, wellhead protection, stream restoration, Total Maximum Daily Load (TMDL) compliance and carbon sequestration efforts.

One of the first considerations is to align a state’s mapping capabilities. The use of GIS and mapping has rapidly expanded, but often these functions are fragmented among various state agencies, universities, and the private sector. States can help by designating a one-stop agency, or similarly, a mapping and reporting protocol that allows designated agencies or organizations to create one master map depicting various resources. Recognizing a state data clearinghouse as the state’s official node for National Spatial Data Infrastructure makes a state eligible for federal grants for GIS development. Once established, this effort could help support a data base, land and easement tracking, and a land banking system.

A next step would be to create an inventory that characterizes land currently designated as open space. Over time, such a program could evolve to track both public and privately held open space. It could also be used to track preservation status, showing for example whether a tract is permanently preserved or under a time-limited easement.

EXAMPLES

Maryland’s Green Infrastructure Program

Maryland’s Green Infrastructure program is a GIS-based program operated by the Department of Natural Resources that was initially focused on forestland and wildlife habitat. Funding for the Green Infrastructure Program was established as a line item in the state budget. The program consisted of two phases: (1) The Green Infrastructure Assessment, which was largely a mapping process, and, (2) the GreenPrint program, which prioritizes and values lands based on which ones support multiple state objectives. Under the GreenPrint

program, the State assesses the relative conservation value of specific parcels offered for sale or easement.

Maryland's Green Infrastructure Program: <http://www.dnr.state.md.us/greenways/>

Delaware's Green Infrastructure Program

In 2003 Governor Ruth Ann Minner signed an Executive Order on Green Infrastructure, which formalized several mapping and planning activities underway. The Executive Order, which was launched under the Livable Delaware Program:

- tied state investment and grant decisions to green infrastructure goals;
- secured the appointment of a Green Infrastructure Conservation Coordinator within the Department of Natural Resources and Environmental Control to work with all state agencies;
- provided an inventory of state-owned land; and
- instituted a Green Infrastructure strategy to implement the planning effort.

The Departments of Agriculture and Natural Resources also produced a Green Infrastructure map in 2004, which was then incorporated into Delaware's Wildlife Plan.

Delaware's Green Infrastructure Program: <http://www.dnrec.delaware.gov/GI/Pages/index.aspx>

2

Identify natural lands and open space for preservation

ACTION

States should conduct an inventory of their natural lands and open space to identify which lands are most important to protect and which are best suited for development. Natural, undeveloped lands and open space deliver many important environmental services, including protection of drinking water sources, groundwater recharge, water and air quality protection, stormwater management, natural management of floods, critical wildlife habitat, crop pollinator habitat, and carbon sequestration. These lands also can provide recreation and tourism opportunities, support natural resource-based industries, and play a critical role in shaping regional development patterns. Importantly, residents place great value on efforts to protect the scenic beauty of the natural areas of their states.

Natural lands often are protected in an uncoordinated and fragmented fashion, if at all. This can make it difficult to realize the full environmental benefits of preservation and also can reduce the effectiveness of using land preservation to shape growth patterns and direct development to existing communities. A more systematic approach can help focus and coordinate conservation, planning, and investment efforts at the state and local levels to achieve statewide land preservation goals and objectives.

PROCESS

The Department of Natural Resources (or similar department) can pursue a more strategic and systematic approach to land preservation by working with local officials, stakeholders, and citizens to identify, prioritize, and map highly valued natural areas and open space that should be targeted for land conservation. Lands targeted for conservation should be identified through a criterion driven approach. To maximize environmental benefits, emphasis should be placed on defining contiguous corridors and hubs that link or restore high value areas of the natural landscape. The Department of Natural Resources can coordinate available GIS data across departments (e.g. natural resources, transportation, planning, historic resources, health and human resources) to assist in the inventorying effort.

Citizen and stakeholder involvement and support is important in this process and can help build support for subsequent acquisition and preservation of lands identified through the inventory process, and for selling the concept of conservation. In order to build a broad constituency for land preservation, states should develop public involvement, communications, and marketing strategies that target a wide range of interest groups and create a shared vision of what lands to protect. It is important that involvement activities reach environmental groups, land trusts, hunting and fishing interests, outdoor recreation groups, other natural supporters of land preservation, and other stakeholder groups, including potential opponents.

EXAMPLES

Maryland's Rural Legacy and GreenPrint Programs

The Maryland Rural Legacy Program was enacted in 1997 as the rural counterpart to the urban-focused portion of Maryland's then-new Smart Growth initiative. The program, designed to protect the state's remaining "rural

legacy," invites willing landowners, private land trusts and local governments to identify large, contiguous tracts of undeveloped (or relatively undeveloped) land that could be designated for permanent protection. Proposals from various parts of the state then compete against each other for a share of state funds that can be used to purchase development rights on properties within designated Rural Legacy Areas or, in rare circumstances, to purchase the properties outright.

In 2001, the State of Maryland created a companion land preservation program called GreenPrint. It was specifically designed to protect lands critical to the long-term ecological health of the state – the state's "green infrastructure." It was based on an extensive, comprehensive inventory of the most ecologically significant lands still remaining in the state. This effort attempted to identify larger "hubs" of environmentally important lands and more linear corridors – so-called "habitat highways" – that connected the hubs. The program identified more than 2 million acres of critical lands in Maryland (nearly one-third of the land mass of the state), of which about 75 percent was unprotected.

Maryland's GreenPrint Program: <http://www.greenprint.maryland.gov/>

Maryland's Rural Legacy Program: <http://www.dnr.state.md.us/land/rurallegacy/index.asp>

Arizona's Sonoran Desert Conservation Plan

The Sonoran Desert Conservation Plan, developed under the leadership of the Pima County (Arizona) Board of Supervisors, combined science-based planning with extensive public involvement and education. Information gathered at more than 400 public meetings contributed to the plan, as did a series of educational workshops, a citizens' steering committee with more than 80 members, and numerous advisory and technical teams. The resulting plan integrates natural resource protection with all county land use planning.

Sonoran Desert Conservation Plan: <http://www.pima.gov/cmolsdcp/>

3

Establish dedicated state funding for land conservation

ACTION

One way of assuring that a state's natural resources are protected is to create programs that provide dedicated, continuous funding for land conservation. The State can do this by creating a funding source for land preservation and restoration, providing matching funds to local governments that create their own conservation funds, and giving matching grants to non-profit land conservation organizations. To ensure both action and commitment and to leverage scarce resources, states can require a match, implement a funding sunset provision, and require that all purchases be targeted to high-priority lands and linked to local smart growth plans.

PROCESS

States can provide funding to conserve, protect, and restore important natural and working lands through a variety of mechanisms. Some of the funding strategies used by states include:

- bonds (New Jersey, California, Florida);
- general fund appropriations (Arizona, Indiana, Georgia);
- environmental license plate sales (Connecticut, Mississippi, Pennsylvania);
- real estate transfer taxes (Washington, Illinois, Delaware, Maryland);
- cigarette taxes (Minnesota, Texas, Nebraska);
- sales taxes (Missouri, New Jersey, Arkansas);
- gas taxes (Idaho, California);
- lotteries (Maine, Oregon, Colorado);
- environmental penalty money (Alaska, Utah, Kentucky); and,
- state statutes (Massachusetts).

While there are numerous ways for states to dedicate money for conservation, there are best practices that allow states to leverage their investment. Local governments are important partners in successful conservation efforts. State conservation programs should have incentives to encourage good land conservation practices at the local level, such as matching grants. Local governments should be encouraged to conduct comprehensive planning that incorporates the results of a green infrastructure inventory and clearly defines high-priority areas for conservation and restoration, as well as areas for development. In order to assure that

state investment in land conservation is used effectively, the State should require local governments to institute strong conservation zoning as a condition before they may receive state funds.

EXAMPLE

North Carolina's Natural Heritage Fund

North Carolina supports land conservation through three separate trust funds: The Natural Heritage Trust Fund, The Parks and Recreation Trust Fund, and the Clean Water Management Trust Fund. Two of these funds draw upon a real estate transfer tax, one also relies on the sale of personalized license plates, and another relies on general appropriations.

North Carolina's Natural Heritage Fund: <http://www.ncnhhf.org/>

4

Help localities set and achieve land conservation goals

ACTION

Local land preservation efforts are critical to meeting statewide land preservation goals. Local efforts can benefit from both technical and financial support from the State. The State can support local efforts by inventorying open space and natural areas, providing mapping support, technical information and assistance, training, and matching funds that are contingent on demonstrated local leadership and commitment to land conservation.

PROCESS

States can provide a variety of technical and financial assistance to local preservation efforts.

- The state can provide localities with the technical information and maps generated by an open space inventory (*as discussed above in Policy #2, Identify natural lands and open space for preservation, in this section*) in order to help localities make informed decisions about which lands should be preserved and which might be targeted for development.
- The State can create a public-private partnership to coordinate, market, and deliver training and technical assistance to help municipalities plan for and fund conservation.

- The State can provide training and matching funds to local governments to support environmental restoration of degraded lands that have been identified as a high priority for establishing a functional green infrastructure network.
- The State could encourage counties to work with non-profit organizations, private industries, and citizen groups on land conservation initiatives. The State could provide technical assistance and financial support (contingent on a local match) to help every county establish a land trust.
- The State can make state financial assistance to local governments contingent on demonstrated smart growth commitments by localities through zoning that supports smart growth, local funding that is directed toward it, and so forth (*see Action #8, Integrate the state's growth criteria into discretionary funding decisions, in the Comprehensive Approaches section*).

EXAMPLE

New Jersey's Green Acres Program

New Jersey's Green Acres program provides grants and loans to local governments that have an open space plan and have enacted an open space tax. The program also gives grants to non-profit organizations to acquire land for public recreation and conservation.

New Jersey's Green Acres Program: <http://www.state.nj.us/depl/greenacres/trust.htm>

5

Increase funding and support for urban forestry and park access

ACTION

Urban street trees, parks, and gardens can reduce stormwater runoff, air pollution, energy use in buildings, and noise levels. They also can increase the value of nearby residences, support physical activity, and improve public health. When urban parks are designed and maintained as an interconnected system, their ability to support biodiversity, manage stormwater runoff, provide recreational opportunities, and expand available transportation options through trail networks increases. The State can support urban forestry and park access by increasing funding and providing technical support.

PROCESS

States can designate an office to focus on urban forestry that can act as both a resource and advocate for urban forestry issues. This office, in turn, can partner with other state agencies, and draw on the experience and assistance of national organizations such as the National Urban and Community Forestry Advisory Council.

The State can work with the parks departments of the state's major urban areas to conduct tree inventories and assess tree canopy status and trends. This effort can be coupled with broader assistance to urban park departments to assess the condition of current parks and the need for additional ones. The latter activity might include inventorying vacant land or abandoned properties, some of which may be appropriate for redevelopment, but some of which may be appropriate for (and already used as) neighborhood gardens or public green space.

The State can create a competitive grant process for urban park, forestry, and garden projects. Criteria for funding could include how well the project provides a wide range of urban green space benefits. For example, emphasis might be placed on ensuring all residents (including under-served communities) have access to green space; promoting connectivity across urban green spaces; protecting drinking water sources; or encouraging management approaches that emphasize native trees and plants, or hybrids adapted to local conditions (thereby promoting green infrastructure function and restoration).

The State can pool grant funds across state agencies with related interests. This might include non-environmental agencies, such as housing and urban development, since the amenities from the urban forest can increase home values and nurture a strong sense of community.

The State can strengthen or help coordinate local agricultural extension services to community gardeners and others seeking to restore or maintain native trees and plants on their property.

EXAMPLE

Michigan's Detroit Urban Ecosystem Analysis

Michigan's Department of Natural Resources joined with the U.S. Department of Agriculture and American Forests, a non-profit group, to study the infrastructure benefits of trees and natural land cover in southeast Michigan, a nine-county area that includes Detroit, its suburbs, and the city of Ann Arbor. The study

illustrated and quantified the financial and environmental management benefits that could be achieved by protecting and restoring the area's urban forests.

Michigan Department of Natural Resources:

<http://www.michigan.gov/dnr>

Study of Southeast Michigan's Land Reveals Tree Canopy Acts as a Public Utility, American Forests: <http://www.americanforests.org/news/display.php?id=154>

National Urban and Community Forestry Advisory Council: <http://www.treelink.org/nucfac>

6

Integrate smart growth into the state stormwater program

ACTION

The federal Clean Water Act directs states to implement stormwater management programs that prevent and reduce stormwater runoff impacts related to both water quality and quantity. Stormwater washes pollutants from roads and other impervious surfaces, such as parking lots, into streams, rivers, and other bodies of water. As more land is converted to impervious surfaces, or when agricultural lands are not properly buffered with trees, stormwater runs off faster and in greater quantities. This can cause erosion and sedimentation and contamination, and make flooding more likely.

Stormwater outcomes are affected by development decisions at every level: regional, neighborhood, and site. Stormwater is best understood at the site level, where conventional drainage practices basically divert runoff to the nearest local waterway. The cumulative impact of connected drainage has been detrimental to streams, where collected pollutants, excess volume, and fast-flowing water have altered habitat, drinking water quality, and flood plains. At the larger watershed scale, land alteration, grading and loss of natural cover affect aquifer recharge, stream flows, and floodplain management. Many state costs related to property damage, inter-basin water transfers, and regional detention can often be traced back to poor land development practices.

State stormwater programs and permits could provide cheaper, more effective, and more flexible alternatives for communities by recognizing the role that more

sustainable development practices can play in helping to achieve clean water. In October 2008, the National Academy of Sciences released a report urging transition from the current permitting structure to one that is watershed based. This approach would look at broad land conservation and green infrastructure as a first step in managing water resources (including stormwater). For new development, requirements would be shaped by location in the watershed, but at a minimum emphasize low-impact techniques. Infill and redevelopment come with very different stormwater needs, in part because redevelopment and brownfield sites require carefully selected combinations of best management practices to address urban pollutants and overcome site constraints.

PROCESS

The main program elements that states administer for stormwater programs include (1) the permit, (2) lists of accepted practices and performance standards, (3) guidance or design manuals, and (4) outreach and education materials. States can rewrite their stormwater permits, associated manuals, and guidance to recognize the effectiveness of smart growth development approaches in preventing and reducing stormwater runoff. Depending on the existing environmental and economic conditions, this may include:

- separating the National Pollutant Discharge Elimination System (NPDES) and program elements for new development, redevelopment and infill;
- establishing a credit system to account for “imperviousness avoided” through redevelopment, compact development and/or vertical development; or
- developing stormwater projects, through an economic development fund, tied to NPDES compliance as an incentive within identified growth and redevelopment areas.

For example, states can provide a methodology for determining the runoff prevention of reusing a brownfield site versus the same level of development as built under conventional zoning on a greenfield site. This type of analysis would move away from conventional engineering assessments that only consider runoff from individual sites, to a more robust evaluation of watershed-level impacts, improvements, and trade-offs.

Brownfield redevelopment reveals a level of stormwater planning that is often overlooked: planning at the district level. Most permits present requirements for large-scale watershed planning and detailed site design.

However, one of the most powerful tools for shrinking the environmental impacts of new development and redevelopment comes from coordinating development within a district. This coordination results in shared impervious cover, such as parking and loading, support for higher density and mixed-use development, and low-impact transportation choices. The stormwater benefits are two-fold: (1) advanced planning to control runoff within the district; and (2) a smaller overall development footprint. In addition to watershed plans and low impact site design, states can develop permits, performance standards, and design manuals for districts. In fact, states may have prepared the groundwork in manuals directing transit-oriented development, traditional neighborhood design, and downtown redevelopment.

EXAMPLES

California's Regional Water Quality Control Boards

California has divided the state into nine Regional Water Quality Control Boards to address regional differences in rainfall, flooding, and restoration. The Los Angeles Regional Water Quality Control Board has issued several draft permits with innovative approaches to district level stormwater management. The draft Ventura County permit establishes the “Redevelopment Plan Area Management Plan,” which can serve in part or whole to control stormwater runoff from the developed area. The premise of such a district is that the rigorous performance standards established for individual development projects may not be feasible in areas struggling to attract investment, or favor building rehabilitation instead of redevelopment to circumvent permit requirements. By pursuing both site improvements and district-wide approaches, cities have expanded options to leverage capital investment, economic development funds, and shared solutions to stormwater runoff management. Several cities in Ventura County are exploring use of this, or some similar approach, to control stormwater.

California State Resources Control Board: <http://www.waterboards.ca.gov/>

Michigan's Water Program

The State of Michigan is recognized as a national leader in supporting flexible and innovative water programs, such as the Rouge River demonstration project and the alternative watershed-based stormwater permit. Michigan has worked closely with towns wishing to

pursue innovative use of permitting flexibility. One of the more recent examples of innovation comes from Grand Rapids, Michigan. The city, in seeking to direct growth downtown, formulated a credit system for high-density development locating to the core. This system compares the footprint and runoff of a multi-story building to the footprint of the same amount of development if constructed under conventional zoning. For example, a five-story building with 20 units may produce x gallons of runoff, but the runoff from 20 individual units as single-story, single-family homes would be a multiple of x with the additional rooftops, roads, and driveways. Grand Rapids surveyed where growth might go to determine the runoff factors for typical single-family homes in growth areas. The City also determined that the receiving body of water could accept the runoff volume since the buildings were replacing impervious cover.

Presentation on Grand Rapids' program: <http://www.smartgrowthonlineaudio.org/Inp2008/223-c.pdf>

7

Change the criteria for water and wastewater infrastructure

ACTION

States should mandate that water and wastewater infrastructure project approvals be prioritized to support smart growth development ahead of more conventional development. This is important because where and how drinking water and wastewater infrastructure is designed, approved, and built largely governs where and how growth occurs. In fact, some states inadvertently penalize more desirable development projects by limiting public funding for the sewer expansion that is often needed to support infill development. States can have enormous influence on growth patterns by harnessing the approval mechanisms for these types of built infrastructure.

PROCESS

For public water and wastewater infrastructure, preferences for approval can be given to higher-density growth located in or near existing developed areas, near public transportation, and separated from critical environmental resources. Preference can be given to public infrastructure for projects that are pedestrian

friendly, include mixed uses, offer affordable housing, and provide multiple transportation options.

For on-site water and wastewater, approval can be contingent on strict ecological analysis of the site's carrying capacity; rigorous review for impacts on water quality, water quantity, and important wildlife habitat; and consistency with regional and local land use plans. The cumulative impacts from multiple applications also should be considered during the approval process rather than reviewing individual projects in isolation.

Once a statewide regulatory approach is established, decisions on infrastructure projects for designated growth areas can be expedited. Decisions for infrastructure outside of areas designated for public service can be subject to strict – and slower – review. Designated growth areas selected for improved or extended infrastructure can receive priority for non-point source or stormwater funding to reduce water quality impairments associated with the new development.

EXAMPLES

Wisconsin's Area-Wide Water Quality Management Planning

Wisconsin uses planned sewer service areas to encourage integration of wastewater infrastructure with local planning. The State excludes environmentally sensitive areas from consideration for service and requires that wastewater infrastructure plans correspond with local comprehensive plans and ordinances.

Wisconsin's Area-Wide Water Quality Management Planning: <http://www.govinstitute.org/policyguide/NaturalResourcesEnvironment/www.dnr.state.wi.us/org/water/wm/lwsp/lssaplan>

Massachusetts' State Drinking Water State Revolving Loan Fund

The Commonwealth of Massachusetts actively limits the use of state wastewater infrastructure dollars to support new growth. Under their Drinking Water State Revolving Loan program, the Commonwealth evaluates proposals on the extent to which the project is consistent with the Commonwealth's Sustainable Development Principles, local watershed management plans, and/or local and regional growth or infrastructure plans. The Commonwealth Sustainable Development Principles direct state agencies to use public infrastructure investments to encourage reuse and rehabilitation of

existing infrastructure rather than the construction of new infrastructure in undeveloped areas.

Massachusetts' State Drinking Water State Revolving Loan Fund: <http://www.mass.gov/depl/water/wastewater/dwsrffs.htm>

8

Align the state Total Maximum Daily Loads program with local plans for smart growth

ACTION

Under Section 303(d) of the federal Clean Water Act, states are responsible for establishing water quality standards for their rivers, lakes, and other waterways. This includes developing and implementing plans to meet those standards, called Total Maximum Daily Loads (TMDL). Waterways that do not meet standards are typically located in developed areas. Directing development to existing communities and on already degraded land is a key smart growth principle and offers watershed benefits in several ways. First, developed land, such as parking lots, can accommodate new development without increasing impervious surface. When built at higher densities, each extra story of development is built under the same roof. Second, when a vacant site is passed over for a greenfield option, the watershed faces runoff from two sites, not one. Finally, even with new green practices, removing forest cover to install green pavers is still a net negative loss for the watershed when off-site roads and access to support the new development are included in the watershed calculation. Most importantly, when redeveloped with “green infrastructure” stormwater techniques (such as green roofs), the volume of stormwater runoff and pollutant loadings from these sites often decreases.

PROCESS

As in the area of stormwater management, a great deal of innovation is occurring with regard to smart growth and TMDLs, as a result of joint state and local efforts. Integration of smarter growth practices into TMDL programs can be regarded as not just low impact, but “positive impact” solutions because impaired waterways are improved as each project or retrofit removes targeted pollutants. States can position programs that

reuse impervious cover, direct growth to higher-density districts, and retrofit urban areas as part of a “positive impact” campaign. Because redevelopment and higher-density development can be more difficult to undertake, states can emphasize and encourage “fee in lieu of programs” in instances where on-site practices are impractical.

When developing a TMDL, states can take into account future growth projections and establish a TMDL that accommodates new development activity in areas that already have impaired water quality. According to the Water Environment Federation, few states explicitly account for impacts from future growth. As such, their guidance documents represent an opportunity to include current and future land use decisions within the TMDL process. For example, communities that take steps to mitigate the water quality impacts—both at the site and regional level—of their growth decisions would go a long way toward achieving target loadings of some TMDLs. States could detail what land use changes they would like to see implemented, such as more compact site designs, transit-oriented development, larger riparian corridors, or larger areas of open space incorporated into the urban and suburban fabric. To encourage communities to act, states could offer these communities “bonus” points on any applications for Clean Water Act Section 319 or State Revolving Fund (SRF) funding, or other state-allocated funding sources. Although the bonus points would not guarantee a successful application, they would give an advantage to those communities that implemented the land use mitigation measures over those communities that did not.

EXAMPLE

Georgia's TMDL Process

Georgia, as part of its TMDL process, requires any locality asking the State for an environmental permit that facilitates growth and development (e.g., wastewater or water withdrawal permit) to conduct a watershed assessment. These assessments provide additional information on point and non-point pollution sources. Applicants must identify pollution sources, model future land use scenarios, and provide solutions to water quality problems.

Georgia Department of Natural Resources, Environmental Protection Division: http://www.gaepd.org/Documents/techguide_wpb.html#tmdl

9

Encourage zoning code and business licensing to protect and preserve sources of drinking water

ACTION

Under the Safe Drinking Water Act, public water systems must meet federal drinking water safety standards. If the source water does not meet these standards, consumers must pay for drinking water treatment. But anthropogenic contamination can be prevented through state and local zoning code and business licensing. That is, governments can prohibit the siting of certain facilities or the conduct of certain activities within sensitive aquifer recharge areas or near surface waters used as drinking water supplies. State and local authorities can also be used to require more efficient use of water resources, such as recycling and use of water-efficient household items and irrigation devices. Since many activities, particularly of small businesses, fall outside the jurisdiction of federal environmental programs, state and local authorities must assume the responsibility to fill in the gaps if they do not wish to leave drinking water sources unprotected.

PROCESS

Local governments, water system managers, and other community leaders should identify and map all sensitive source water locations and delineate the land areas that can affect them. This information should then be used during master plan reviews and general business licensing updates. Governments should calculate the cost of treating contaminated source waters that is likely to occur from current and prospective business practices, including agricultural practices. They should also assess the sustainability of existing sources of drinking water, determining how much water there is, how fast it is being used, and how long it will last. They should then provide these analyses to elected leaders, land use decision makers, and stakeholder groups for use in reviewing master plans or developing business licensing procedures.

10

Take credit for land use change under the State Implementation Plan

ACTION

Under the federal Clean Air Act, states must meet national ambient air quality standards. Every three years, states are required to develop a State Implementation Plan (SIP) that describes how they will accomplish that goal. Typically, states develop SIPs for areas within the state that are out of compliance with air quality standards rather than for the whole state. Inability to meet air quality standards can result in a loss of federal transportation dollars.

In 2001, the Environmental Protection Agency issued guidance that made it possible for states to receive credit for land use activities that increase transportation choices. Under this guidance, states can receive credit for a range of smart growth land use activities, including transit-oriented development, infill and brownfield development, mixed-use development, traditional neighborhood design, development of activity centers, strengthening of downtowns, and improvements to the regional jobs/housing balance.

PROCESS

When developing their SIPs, states must project the anticipated emissions that will result if current conditions persist. The resulting projection is called the baseline emissions budget. Smart growth strategies are expected to lower anticipated emissions by increasing regional transportation choices. Thus, when estimating a baseline emissions budget, states should modify the baseline to reflect expected reductions from smart growth development projects and policies that are planned or already in place.

States can identify smart growth projects as traditional control strategies within the SIP. In doing so, states indicate that such projects will help reduce future emissions and thus aid in compliance with air quality standards. States can also take credit for financial incentives, such as tax breaks for brownfield cleanup and redevelopment, or voluntary approaches, such as a developer's intent to build a neighborhood according to smart growth principles under the SIP.

EXAMPLE

Atlantic Station

Atlantic Station, a \$2 billion smart growth project on a 138-acre brownfield site in the heart of midtown Atlanta, is an example of an innovative approach to traditional control strategies. For adequate access to roads and transit, a bridge needed to be built. Because Atlanta had not meet Clean Air Act standards, the bridge was prohibited under a standard interpretation of EPA regulations. After demonstrating the air pollution reductions that would be achieved through smart growth redevelopment of the site, EPA used available regulatory flexibility to allow the development to proceed, categorizing the redevelopment as a transportation control measure (i.e., a traditional control strategy).

Atlantic Steel Redevelopment Project: http://www.epa.gov/smartgrowth/topics/atlantic_steel.htm

11

Utilize flexibility in federal water and coastal funding programs

ACTION

The U.S. EPA and the National Oceanic and Atmospheric Administration (NOAA) provide funding to states for projects that help reduce non-point source pollution. States often use federal dollars to construct and upgrade wastewater treatment facilities, and to fulfill other capital needs to meet water quality protection goals. Federal dollars, particularly under EPA's state revolving fund program, EPA's Clean Water Act Section 319 grants, and NOAA's coastal zone protection program, can be used for land use and development practices, such as land conservation or infill development, that help reduce non-point source pollution. Additionally, states can add funding criteria to these programs that align capital and infrastructure investments and actions with smart growth objectives.

PROCESS

State Revolving Loan Fund

EPA offers two state revolving loan fund programs, the Safe Drinking Water State Revolving Fund and the Clean Water State Revolving Loan Fund. The Safe Drinking Water State Revolving Fund primarily provides low-interest loans to community and public water suppliers for improvements to wastewater treatment infrastructure. The program requires priority to be given to projects that: (1) address the most serious human health risks, (2) are necessary to ensure safe drinking water, and (3) serve systems that are most in need. Once these criteria are met, states can use additional criteria to align infrastructure investments with smart growth goals. For example, states can develop criteria for a fix-it first strategy that targets investments to existing wastewater treatment facilities rather than constructing new facilities. (see Policy #7, *Change criteria for water and wastewater infrastructure*, in this section). States can leverage smart growth benefits out of existing State Revolving Fund resources by granting additional funds for smart growth enhancements to traditional projects or providing technical assistance on smart growth to project applicants. States could also require long-term comprehensive growth plans, or encourage limits on sewer connections or capacity for new growth in designated areas. Funds also could be used to support and create incentives for comprehensive planning and maintenance of existing water infrastructure.

Both the Safe Drinking Water State Revolving Fund and the Clean Water State Revolving Fund can be used to purchase undeveloped land or conservation easements to protect source water. In addition, Clean Water State Revolving Fund resources can be used to clean up and reuse brownfields.

Section 319 (h) grants

Typically administered by the states, section 319(h) of the Clean Water Act is one of the primary funding mechanisms for addressing non-point sources of pollution. Under Section 319(h), States can use 319(h) funds to support a range of activities, including technical and financial assistance, training, demonstration projects, and monitoring the results of nonpoint source implementation projects.

Non-point source pollution associated with development can be a major cause of water quality impairment. The State should develop and implement selection criteria for the 319(h) funds to favor projects that achieve the dual objectives of reducing non-point source pollution and supporting smart growth outcomes. This might include:

- street and road design guidelines that minimize non-point source runoff;
- audits of parking requirements for new development, redevelopment, and infill;
- audits of zoning, subdivision ordinances, and building codes to remove barriers and provide incentives for infill and redevelopment; and
- other pollution-reduction strategies for infill projects.

Coastal Zone Grant Programs

The NOAA gives states funds to protect coastal resources and address non-point sources of pollution under their coastal zone management program. The state develops the project selection criteria and establishes the program areas for which funds are provided. This provides flexibility for the programs to be used to support projects that achieve reductions in non-point source pollution to coastal waters and are consistent with smart growth outcomes. For instance, coastal zone grant program funds can be used to support brownfield redevelopment or fund community planning activities, such as code audits, community visioning efforts and design charettes, and public awareness and education programs.

EXAMPLES

Maryland's Water Quality Revolving Loan Fund

Maryland's Water Quality Revolving Loan Fund provides financial assistance for projects that protect or improve the quality of the state's rivers, streams, lakes, estuaries, and other water resources. The State prohibits the use of revolving loan funds for projects outside urban growth boundaries established by the counties. Exceptions will be made if serious health conditions exist.

Maryland Department of Environment Water Quality Revolving Loan Fund: http://www.mde.state.md.us/Programs/WaterPrograms/Water_Quality_Finance/Water_Quality_FundIndex.asp

Iowa's Clean Water Revolving Loan Fund

In 2002, Iowa created the Smart State Revolving Fund for Iowa Clean Water program. This program allows the use of the state's drinking water SRFs for smart growth initiatives, including brownfields cleanup, watershed

management, low-impact development practices, and riparian land conservation. The Iowa Finance Authority and the Iowa Department of Natural Resources launched the initiative to change the state's non-point source protection plan and the SRF statute to allow the use of SRF funding for smart growth projects.

Iowa Department of Natural Resources Clean Water State Revolving Fund Loan Program: <http://www.iowadnr.gov/water/wastewater/cwsrf.html>

12

Use smart growth and watershed planning as key features in flood prevention and management programs

ACTION

Although flooding is often referred to as a natural disaster, states, local officials, and water resource organizations are increasingly recognizing that some flooding is the result of man-made actions arising from poor land use planning and resource management decisions.

The relationship between poor land development patterns and flooding is largely the result of increased amounts of impervious surface coverage and the loss of water storage areas. As forests and fields are converted to development or other uses, rainwater that previously soaked into soils instead runs with increased velocity over hardened surfaces. Models show that the more extensive and connected the new development, the higher the risk of flooding. While most flood codes are directed at regulating individual building sites, prevention can be enhanced by steering redevelopment to less flood-prone areas, strengthening low-lying cities, and minimizing loss of forest cover, wetlands, and open space.

There are several ways states can improve flood prevention and mitigation policies. First, the American Association of Floodplain Managers advocates the adoption of a "No Adverse Impact" floodplain management framework. "No Adverse Impact" floodplain management rests on the concept that the actions of a property owner should not be allowed to adversely affect the rights of other property owners. While applied routinely at the individual site level, this

concept is increasingly being considered for a larger community scale to address downstream impacts caused by decisions made elsewhere in the watershed. "No Adverse Impact" is not a "no development" stance, but rather a sharper focus on the ramifications of various development scenarios and assignment of mitigation. Floodplain managers speak of this as "protecting property rights on both sides of the fence." Projected impacts are matched with mitigation early in the planning stage. This larger planning framework also allows planners to anticipate changes likely to come as a result of climate change.

States also have a role in bridging the Federal Flood Insurance program and the Community Rating System, which establishes lower flood insurance rates for communities based on implementation of flood mitigation measures, such as revised zoning and building codes. FEMA also supplies planning funds through the Flood Mitigation Fund, which are targeted at lowering risks through comprehensive planning.

PROCESS

A comprehensive State Flood Management program consists of measures addressing both prevention and mitigation. States will likely retain traditional emergency response and natural resource management responsibilities, but as issues related to build-out, liability, and climate change increase, states are in a unique role to broker solutions. These solutions will require sophisticated modeling and quantification, and as such, are best executed in conjunction with a green infrastructure or other mapping/modeling effort. Other avenues include the state's stormwater management programs, where low- or no-impact policies for new development are key.

Second, states can integrate ongoing smart growth efforts into the Community Rating System. FEMA assigns points for various activities related to smart growth, such as comprehensive planning. Where older cities with existing infrastructure also lie in flood and hazard zones, states will increasingly be called upon to work with communities on risk reduction, which will include acquisition of open space and infrastructure upgrades.

EXAMPLES

California's Flood Management Program No other state illustrates the changing landscape in flood-related accountability and liability better than California. In 2007,

Governor Arnold Schwarzenegger signed a package of five interrelated bills targeting flood management in the state's Central Valley. The original legislation addressed aging levees, but legislators realized that levee repair was only one of many comprehensive reforms needed to prevent harm and protect property. The package, which included a new Flood Management administrative framework, focused on land use and flood protection by:

- requiring an enhanced flood protection plan for the entire valley, on the basis of which cities then prepare and/or update general plans and land development regulations;
- requiring shared contribution to flood damage costs between the state and local governments when local governments approve new developments in previously undeveloped areas; and
- instituting building restrictions in areas that do not have 200-year flood protection (i.e., the flooding associated with a storm that with a 0.5 percent chance of occurring in any year) unless adequate progress is being made to achieve that level of protection. All areas of new development must have 200-year protection by 2025.

California Department of Water Resources: <http://www.water.ca.gov/>

Texas' Mitigation Program

The State of Texas estimates that 91 percent of disaster funding is directed to flood-related damage throughout the state. As such, Texas has launched an aggressive program that includes acquisition of repetitive-loss structures, strict building codes, and planning. The State launched an outreach program to assist localities through technical assistance and identification of funding opportunities. In 2007, the State added "No Adverse Impact" to its list of management activities.

The smart growth link lies within the Texas Mitigation Handbook, issued in 2002. The Handbook's "Mitigation Goals and Strategies" section links local comprehensive and capital improvement plans to state mitigation goals by seeking to limit new development in hazard-prone areas and by encouraging disaster-resistant practices.

The Handbook provides examples of how to achieve these goals, including:

- Use economic development funds to improve low-hazard areas and attract businesses to those areas and away from hazardous sites.

- Solicit donations of hazard prone land for recreational or open space use.
- Swap publicly owned low-hazard areas for privately owned high-hazard land.
- Develop public/private partnerships that include business, engineering, and government organizations and universities that work to develop and promote mitigation.
- Establish tax increment financing districts, as in El Paso, Houston, and Dallas, to assist the private sector to abate environmental hazards and revitalize older buildings.
- Initiate local redevelopment initiatives, as in Dallas, Galveston, Fort Worth, and San Antonio, to attract new residents and businesses into downtown areas and so reduce urban sprawl.

Texas Mitigation Handbook: ftp://ftp.txdps.state.tx.us/dem/mitigation/mit_dem_21_060502.pdf

Help Desk

The following resources are available on our Web site at <http://www.govinstitute.org/policyguide/NaturalResourcesEnvironment/helpdesk.html>

Reports

Advice Worth Drinking, Sourcewater Collaborative; Benedict, Mark A. and Edward T. McMahon. 2006. *Green Infrastructure: Linking Landscapes and Communities*, Island Press and The Conservation Fund; McQueen, Mike and Ed McMahon. 2003. *Land Conservation Financing*, Island Press and The Conservation Fund; *City Parks Forum Briefing Paper #5: How Cities Use Parks for Green Infrastructure*, American Planning Association; Ernst, Caryn. 2004. *Protecting the Source*, Trust for Public Land and American Water Works Association; EPA Guidance: *Improving Air Quality Through Land Use Activities*; EPA Guidance Document: *Applying for and Administering CWA Section 319 Grants: A Guide for State Nonpoint Source Agencies*; *10,000 Friends of Pennsylvania, Water and Sewerage Report*

Organizations

The Conservation Fund; Trust for Public Land; The National Urban and Community Forestry Advisory Council; American Forests; USDA's Urban and Community Forestry Program; Biodiversity Partnership; NatureServe

Websites

US EPA Smart Growth and Water Publications; Green Infrastructure; National Floodplain Association: No Adverse Impact, a Toolkit for Commonsense Floodplain Management; The Trust for Public Land (TPL) on-line conservation finance course; EPA Innovative Air Connections page; EPA SIP Policy and Guidance; Guidance on Incorporating Bundled Measures in a State Implementation Plan; Land Use and Transportation page for Sacramento, CA Air Quality Management District