2013-16

Green Infrastructure Center

[STRATEGIC PLAN]

The Green Infrastructure Center created its second strategic plan in 2013. The GIC is now expanding to new regions and developing new methods to advance the field of green infrastructure planning! Learn more....

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Introduction: 2013- 2016 Strategic Plan

The Green Infrastructure Center was founded in 2006. It employs four staff who work across multiple states to help evaluate and conserve green infrastructure assets. This strategic plan updates GIC's prior plan and sets the course for GIC in the next several years. The GIC's first strategic plan (2007-2012) identified three main goals:

- Goal A: To facilitate the use of green infrastructure planning at the local level.
- Goal B: To build awareness of green infrastructure planning within localities, agencies and organizations.
- Goal C: To demonstrate that green infrastructure contributes to community health and economic vitality.

The GIC research the methods to achieve these goals though its field test projects over the past six years. While these goals will continue to remain throughout the life of the GIC, the organization has defined key emerging issues and enterprise projects to address them described on page four under GIC's 'Growth Sectors.'

Why Focus on Green Infrastructure?

While planning for infrastructure -- roads, railroads, bridges, power lines, and storm sewers -- is recognized as a vital element of land and community planning, planning for natural elements is often an afterthought. The GIC helps communities to recognize that natural elements are also part of our infrastructure and should be recognized and included in everyday planning.

We should think of our natural elements as our *Green infrastructure*. Green Infrastructure includes the interconnected natural systems in a landscape, such as intact forests, woodlands, wetlands, parks, rivers and agricultural soils that provide clean water, good air quality, excellent wildlife habitat and prime agricultural soils for growing food. Just as we need roads to transport our food to markets, we also need high quality agricultural soils in which to grow it.

Thinking about environmental resources as green infrastructure is a way to recognize that they have value to people. The benefits provided by our natural resources are also known as *ecosystem services*. These services are provided largely for free, but we must actively seek to conserve the landscape features that support them. The GIC seeks to help conserve these life-sustaining resources by providing communities with tools to identify these resources and they services they provide and then to develop conservation strategies to preserve or restore them.

In addition to recognizing our natural systems we also need to understand how they are connected. A key aspect of green infrastructure planning entails thinking about the landscape as a connected network. Mapping and protecting intact habitats and the connecting corridors is critical to ensuring species diversity. Many species need intact areas that are not bisected by roads, power lines, or other divisions. Often referred to as ‘hubs’ or ‘cores,’ these intact zones are required by some species, such as the Louisiana water thrush, which prefers interior forest and requires clear, clean streams. When habitats are fragmented, other species can invade fragmented areas and compete with native species. For example, brown-headed cow birds invade fragmented areas and place their eggs in the nests of other birds, out competing them for food and resources. Green infrastructure planning seeks to protect and connect intact areas, so that threats to species can be avoided and genetic diversity can be maintained.

Who Does GIC Serve?

The GIC's mission is to assist communities in developing strategies to protect and conserve their ecological and cultural assets through environmentally-sensitive decisions, lifestyles and planning. The GIC addresses land conservation at the local level, where the majority of land decisions are made.

In the United States, more than 39,000 local government entities – counties, municipalities and townships – regulate the use of 70 percent of the country's land base. Thus, local governments are a key audience for GIC's work. There are also many non-government entities focused on land management such as land trusts, land conservancies, developers and others. Thus, local governments as well as private sector land developers and managers have a tremendous influence on the health of our landscapes.

If we fail to help these decision-makers arrive at a comprehensive understanding of the interconnectedness of our air, water and land systems, we may inadvertently compromise the health of our environment. Until we see natural resources as part of a connected infrastructure that supports our everyday lives by providing clean air, clean air, water and soil, we may not recognize the need to actively conserve these natural resources. The GIC was founded to reach out to these decision makers and the communities they represent.

The GIC's primary clients and partners are state natural resource agencies, local governments, land trusts and other land conservation and watershed stewardship organizations. It began its first pilot projects in Virginia but has done projects in North Carolina, Arkansas, New York, South Carolina and across the Southern Region of the United States. The GIC has also provided guidance to counties in Maryland and Michigan.

The GIC provides localities with the vital conservation planning tools to help them make better informed decisions about whether, when, where and how to grow. In short, the GIC seeks to make green infrastructure planning the basis for local land use planning. By better managing our natural assets as part of local land use planning process, we can:

- Preserve biodiversity and wildlife habitat.
- Address global warming (carbon sequestration) and improve air quality.
- Protect and preserve local water quality and supply.
- Provide cost-effective stormwater management and hazard mitigation.
- Improve public health, quality of life and recreation networks.
- Ensure food security by conserving good agricultural soils and preserving local farms.
- Preserve cultural resources such as historic landscapes and scenic vistas.
- Create resilient local economies by protecting forests and fisheries.

GIC Advocates the Use of Sound Data for Decision Making

The GIC seeks to ensure that land-use decisions about what to conserve and how to do it are well informed by the best possible data and objective information about the location and condition of natural resources. The purpose of using the best possible data is to facilitate development patterns that maximize resource conservation and economic efficiency.

Furthermore, these natural resources can be thought of as natural assets. Usually, people think of their 'assets' in terms of financial holdings – bank accounts, savings bonds, stocks, personal property and real estate. Values are assigned to them and this is helpful in deciding what to keep or to sell. We should also assign values to those natural resources that sustain us.

In addition, these natural resources are valuable to us in social terms – terms that are difficult to quantify, but include the social and emotional benefits provided by natural beauty and the open, unspoiled vistas that many of us appreciate.

The recognition of the need to plan for conserving our natural assets has led to the field of green infrastructure planning, in which local communities, landowners and organizations work together to identify, design and conserve their local land network to maintain healthy ecological functioning. In short, it is an organizing construct that enables us to think about our natural resources as a critical part of our life support system. They are 'green' because they are part of the natural environment, and they are 'infrastructure' because they provide those basic services that we all need for healthful and restorative living.

Green infrastructure planning evaluates the types of natural and cultural resources available today and prioritizes those assets that are most important to us, or that best meet our current and future needs. In other words, a green infrastructure strategy includes the process of identifying, evaluating and prioritizing those areas we deem critical to preserving a healthy community for the future. Most importantly, we need to not only prioritize them; we need to take action to ensure their conservation over the long term.

GIC's Accomplishments in Its First Six Years

Over the last six years, the GIC has developed a number of field test projects, in order to create the best methodologies to conserve natural assets while also meeting community goals. Once they were completed, the GIC published a how-to guide, *Evaluating and Conserving Green Infrastructure Across the Landscape: A Practitioner's Guide*. The guide details the steps that communities can follow to create their own green infrastructure plans, based on the lessons GIC has learned from its field tests (see box at right).

The GIC has achieved many accolades and independent recognition for its work. In its first two years, it was singled out in an independent report to the Chesapeake Bay Funders Network as one of the most strategic organizations for restoring the Bay – specifically because of the GIC's unique and practical approach to working with local governments to achieve resource conservation.

The GIC has also won other awards for its work and it has already implemented green infrastructure into several local planning policies. It is regarded as nonpartisan, fair, objective, science-based and innovative in its approach to land planning.

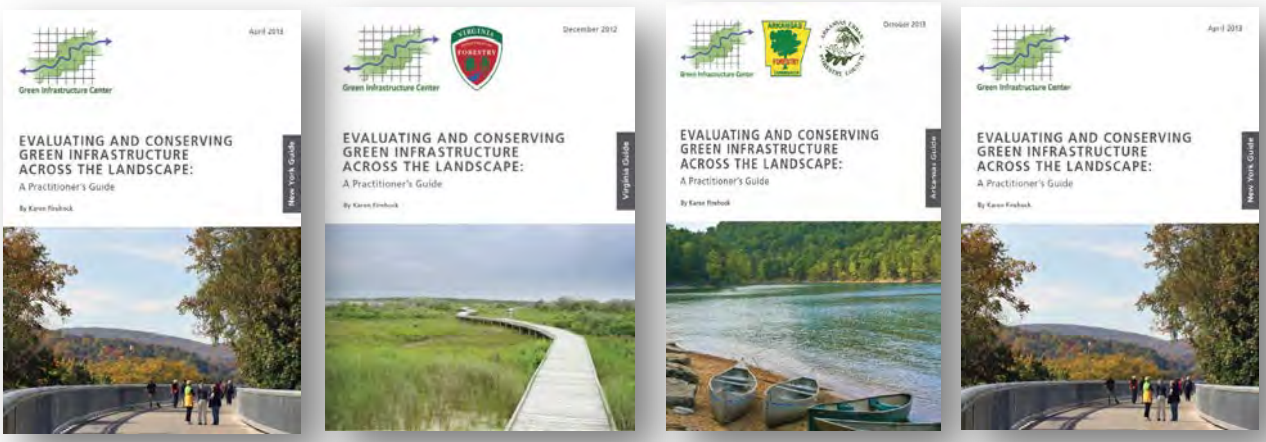
GIC's Field Tests

- Charlottesville City (2007)
- Madison County (2008)
- Lynchburg City(2008)
- New Kent County (2009)
- Staunton City (2009)
- Accomack County (2010)
- Nelson County (2011)
- City of Richmond (2010-11)
- Five Planning District Commissions (2007-12)
- Ulster County, NY (2013)
- Richmond Bellemeade Walkable Watershed (2011-12)
- Richmond Upper Goode's Creek Watershed Coalition (2012- on-going)
- South Carolina (2014-on-going)

Six Year Summary of Accomplishments:

- Implementation of 15 pilot projects in Virginia's regions, counties and towns.
- Consultation to Five Planning Districts that wished to develop regional plans: Richmond, Crater, Rappahannock, Northern Virginia and New River.
- Consultation on strategic land acquisition for several land trusts, such as the New River Valley, Capital Region Land Conservancy and the Northern Virginia Conservation Trust.

- Training and planning guidance to the Virginia Dept of Forestry, the Coastal Zone Program for their *Blue and Green Infrastructure* program and to the National Estuarine Research Reserves.
- Consultation to other states, such as New York, Maryland, Arkansas, and Michigan.
- Featured work in other planning guides and text books, such as *Better Models for Development in the Shenandoah Valley* and *Environmental Land Use Planning and Management*.
- Watershed and planning implementation, such as the Bellemeade Walkable Watersheds project and the Staunton Queen City Green City project, both of which restored riparian corridors, day lighted creeks, created new greenways and implemented low-impact development solutions to stormwater management.
- A two day and a one-day training program for green infrastructure mapping and planning for planners, agencies, land trusts, conservation groups, developers, realtors, foresters and others implemented across Virginia and soon to be in other states.
- A 130-page how-to practitioner's guide for conducting a green infrastructure assessment with completed chapters for Virginia, New York, Arkansas and North Carolina.



GIC Growth Sectors

While the GIC maintains its three primary goals outlined in its first strategic plan, we have refined them and developed new focal areas and projects to achieve them.

The GIC's three main goals:

- Goal A: To facilitate the use of green infrastructure planning at the local level.
- Goal B: To build awareness of green infrastructure planning within localities, agencies and organizations.
- Goal C: To demonstrate that green infrastructure contributes to community health and economic vitality.

Despite GIC's success in field testing its work and implementing GI plans at multiple scales, much remains to be done to ensure broad-scale awareness and implementation of green infrastructure planning.

The GIC's board met in December 2012 and May 2013 to chart the organization's course for the future. Based on an analysis of key emerging trends, the GIC has developed a number of growth sectors for its strategic direction.

An overview of these sectors follows along with a more detailed description of the issues and opportunities they present.

Overview

A network of healthy, well-functioning green infrastructure provides multiple economic, social and environmental benefits to human communities. Designing a network of natural areas helps protect and maintain those benefits and can meet multiple management goals, such as climate change adaptation, natural resource management and hazard mitigation. For example, a well-functioning network of healthy natural infrastructure can absorb storm surge and flood waters, reduce erosion, stabilize shorelines, and reduce overall impacts of natural disasters. Protecting natural areas can also provide access to fitness opportunities to local residents and options to attract companies that place a high value on the green of the local environment.

Encouraging Resilience in a Changing Climate: A green infrastructure approach can create a more resilient ecosystem. Here, *resilience* refers to the amount of change a system can undergo and still retain the same controls on its function and structure (Holling, 1973). And a resilient ecosystem is better able to maintain its core functions while withstanding impacts, such as storm damage. In order to maintain resilience, it is critical to protect the natural state of an ecosystem as much as possible. As climate change begins to introduce more erratic and difficult to predict weather patterns -- more severe storms, prolonged droughts or wildfires -- ensuring healthy, resilient ecosystems is critical to allowing for the continued function of that system.

Greening our Cities, Towns and Suburbs: Re-greening already developed areas is another key trend of concern. As cities and towns reinvent themselves and residents trend toward lifestyles of aging in place (instead of moving to a retirement community), the green areas within the local urban environment becomes an important lifestyle element. Green open spaces and corridors in developed areas provide access to local food, natural beauty and recreation where people live.

Providing Equal Access to Green Spaces: Greening urban areas is also a social justice area as low income neighborhoods populated primarily by Hispanic, African American or Asian races often have less access to green spaces than higher income areas. While this statistic is not surprising, it has other ramifications when considering that issues such as obesity and Type II Diabetes are linked to a sedentary lifestyle. Green space needs to not only exist in these communities; it must also be safe and accessible.

Below are the GIC's focal area issues for the next three years and enterprise projects to address them.

Issue 1: Resilience Planning

As communities experience the impacts wrought by climate change -- changes to species composition, flooding, temperature variations etc -- new plans are needed to enable communities to respond and adapt to changing conditions on the ground and to quickly recover from harm. There may also be permanent changes needed such as moving coastal communities to higher ground or rethinking water supply avenues as prolonged droughts become the norm. There are impacts to be felt to both communities of people and ecological communities as water inundates areas leading to flooding and to changes in habitat dynamics. Ecosystems will also undergo changes from differences in moisture and temperature and this will affect the species that depend on them.

Both communities of people and plants and animals will need to relocate or adapt to these changing environments. For example, the Chincoteague National Wildlife Refuge on Virginia's Eastern Shore now has tree species that were not previously found north of the Carolinas. This affects the refuge's plans for selecting future plantings, as well as whether it can continue to serve the public with beach access, as storms become more severe. And planners recognize the urgency of these issues. The American Planning Association's 2011 survey of

687 coastal planners, which had a 72% response rate, identified land conservation as a very high or high priority issue.

Inland communities are seeing other impacts from climate change, and even more of them will be affected as changes become more apparent. This may include changes in weather (more wet or more dry), as well as changes in the ranges of those species that move to adapt to a warming climate.

Enterprise Project: Coastal Resiliency Planning. Planners need new tools to do their work in a changing environment. The GIC will develop training in coastal resiliency planning in cooperation with NOAA and the National Estuarine Research Reserves. The training can be delivered in a workshop format but the preferred approach is to create an on-line training tool that can be completed by staff, similar to those in-house tutorials that use scenarios built by GIC and NOAA. This will deliver efficient training to those coastal communities that cannot afford to travel to training sessions or take entire days away from the office.

Issue 2: Healthful and Healthy Communities:

Across the United States, populations are aging. And they are trending towards staying in their homes. A national survey found that 80 percent of 'baby boomers' aged 45 and older want to stay in their current homes for as long as possible. In workshops conducted by the GIC, a key theme that emerged from residents and realtors is people's desire to access natural areas and green walks closer to where they live.

There are other demographic trends that also support greener communities, such as the local and healthy food movement (locavores), walk scores, and so on. For the past few years, the American Planning Association (APA) has been promoting Healthy Communities Comprehensive Planning. Interest in healthful, green communities will continue to expand.

Enterprise Project: Healthy Walkable Communities. The GIC has piloted and promoted its Walkable Watersheds Project in Richmond beginning in 2011. The project links healthy communities with clean water; communities can be clean, green, safe and enjoyable. The project includes both planning and installation of environmental remediation and awareness building projects. It functions as a partnership amongst city agencies, nonprofit conservation groups, schools and community members and is funded by federal agencies, the City of Richmond, volunteer labor and corporate donations.

To expand this approach, the Walkable Watersheds pilot will be packaged as a how-to guide for other communities that want to link clean, green and healthy watersheds to healthy, accessible communities. This guide can then be more easily shared as a packaged module for other communities to pilot.

As part of this, the GIC will create its own guide to Walkable Watersheds for healthy communities. The guide will include a score for determining whether a community is healthy ecologically and socially for all ages. This will be similar to other scorecards that have been developed, such as the IPAQ's (International Physical Activity Questionnaire) Survey, but will also include the healthfulness of the surrounding environment.

Issue 3: Integrating GI into Regulatory Programs

In addition to making communities more resilient, the conservation and restoration of green infrastructure can help to mitigate or prevent the impacts of stormwater runoff. Cities such as Chicago, Portland and Richmond have utilized large tunnels to contain their stormwater at a cost of billions of dollars. However, Portland, Oregon, successfully pioneered the surface management of stormwater through low-impact development (LID), which enabled it to avoid the need for large stormwater storage facilities, and led to the EPA endorsing its strategy. Regional stormwater utilities spend a great deal on LID and 'green' streets. However, they may not be

linking these efforts to the retention of existing natural features that address stormwater problems. Some cities are beginning to explore how to use their urban forests to meet regulatory requirements for stormwater reductions. In addition, the way these green spaces are interconnected is not being addressed holistically.

The preservation of natural infrastructure helps avoid future expenditures. Forest cover protects surface water sources and aquifer recharge zones and reduces the cost of drinking water treatment. The American Water Works Association found that a 10% increase in forest cover reduced chemical and treatment costs for drinking water by 20% (Ernst et al. 2004). For rural areas dependent on well water, forests cover helps recharge aquifers by holding water, filtering it and allowing it to slowly infiltrate instead of running off. This means a well is less likely to go dry or need relocation.

Enterprise Project: Green Doctor Checkup. Develop a GI assessment tool or 'checkup' – the Green Doctor – to help localities determine whether they have fully utilized their green infrastructure in meeting such regulatory requirements as open space preservation, stormwater management, clean air goals, TMDLs and other needs. The tool will include an assessment protocol and metrics to help localities and communities identify the next steps to take. It will also help them identify how to better integrate green infrastructure assessments into everyday decisions, such as site plan approvals or comprehensive planning.

In addition to an assessment tool, the GIC will create more interactive tools for decision-makers to utilize green infrastructure data. Increases in coverage and the resolution of data will improve the GIC's ability to perform relevant analyses. For example, as imagery resolution improves, GIC can pilot highly scalable projects that can be utilized for both site planning and regional planning.

In addition, as desktop and web-based platforms improve, the GIC can develop more graphic interface tools so that untrained users can utilize and manipulate GI data. Oftentimes, planning commissioners and boards of supervisors are not trained in using GIS. Having tools that allow anyone, including those with limited computer skills, to understand and utilize GI data for decision making will help to expand green infrastructure planning. There may also be options to create mobile device applications (apps) to allow people in the field to learn about their local GI in real time. The GIC will also investigate other options for utilizing Google Earth/Maps.

The GIC's On-Going Operations

The GIC's On-Going Operations include the following projects:

- Technical Assistance: Providing technical coaching for localities to develop their own GI plans.
- Development of the Profession: Offering university and continuing education credits.
- Awareness Building: Presentations and workshops at professional conferences and workshops.
- State Networks: Building GI models for all states who would like a model (in addition to the four the GIC has already worked on for VA, NY, AR and NC).
- Pilot Demonstrations: Demonstration projects to install new and revitalized green infrastructure in urban communities such as strategic tree canopy planning and restoration, site scale restoration such as bioswales and day lighting and restoring urban waters, new community parks and pathways and urban habitat networks.

Contact Us to Learn More

The GIC is a young organization, formed to fill a gap not currently met by most conservation groups. The GIC's staff are at the cutting edge of new research, innovative design, habitat model building and community planning. We work in all types of environments from wildlands to suburbs to towns and inner cities

As a non-partisan organization, the GIC is able to offer neutral, fact-based decision making tools for any audience. Staff have skills in land planning, geospatial analysis, graphic design, facilitation, ecological restoration, environmental education and consensus building.

The GIC does a great deal of its work in collaboration with other organizations and institutions. Agencies include the US Forest Service, the U.S. Environmental Protection Agency, the National Atmospheric and Oceanic Administration, state agencies in New York, Virginia, Arkansas and North Carolina, and local counties, town and cities.

Contact the GIC to learn more about its emerging research and projects or to propose a new partnership. Visit us on line to learn more about our work at www.gicinc.org or contact us at: Green Infrastructure Center Inc., P.O. Box 317, Charlottesville, Virginia, 22902, (T :) 434-244-0332.