

Methods and Strategies for Financing Green Infrastructure

In the City and County of Durham, North
Carolina



October 2014



UNC

ENVIRONMENTAL FINANCE CENTER

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The Environmental Finance Center at the University of North Carolina, Chapel Hill is part of a network of university-based centers that work on environmental issues, including water resources, solid waste management, energy, and land conservation. The EFC at UNC partners with organizations across the United States to assist communities, provide training and policy analysis services, and disseminate tools and research on a variety of environmental finance and policy topics.

The Environmental Finance Center at the University of North Carolina, Chapel Hill is dedicated to enhancing the ability of governments to provide environmental programs and services in fair, effective, and financially sustainable ways.

Acknowledgements

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Thanks to the all the property owners and environmental professional's that were consulted in developing this document. Special thanks to Sandi Wilbur and Lance Fontaine of the City of Durham, Chris Dreps (Ellerbe Creek Watershed Association) and Peter Raabe (American Rivers) for their thoughtful reviews of earlier drafts. Key research assistance provided by Anna McGeehan. Editorial assistance was provided by Alexandra Kay. This report is a product of the Environmental Finance Center at the University of North Carolina School of Government, Chapel Hill. Findings, interpretations, and conclusions included in this report are those of the authors and do not necessarily reflect the views of EFC funders, the University of North Carolina, the School of Government, or those who provided review.

We are grateful to the U.S. Environmental Protection Agency for funding this research.

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Methods and Strategies for Financing Green Infrastructure

IN THE CITY AND COUNTY OF DURHAM, NORTH CAROLINA

BACKGROUND

Durham County, North Carolina is home to approximately 300,000 people and spans across two of the state's most important and at-risk watersheds: the Neuse River Watershed and the Cape Fear Watershed. Approximately 250,000 people live within the boundaries of the City of Durham with the remainder living in the unincorporated area of the county¹. Green Infrastructure has become an important component of the area's overall water quality improvement strategy and is dominated by stormwater management activities. The majority of stormwater and water quality regulations fall under the responsibility of the City of Durham's Stormwater Utility². However, green infrastructure in this region is not limited to stormwater management activities; it also includes past and potential future investments in open space, energy and greenhouse gas reducing tree planting and other sustainability programs under the oversight of a variety of other governmental and non-governmental implementation entities. Under a Cooperative Agreement with the US Environmental Protection Agency, the Environmental Finance Center at the University of North Carolina carried out a series of research and technical assistance activities related to the financing of Green Infrastructure (GI) in the County. This report identifies and describes the key components of financing mechanisms available to support green infrastructure investments in the County.

¹ Several thousand Durham county residents live within the Municipal boundaries of Raleigh and Chapel Hill.

² Administratively, the Stormwater Utility Activities are primarily carried out by the [Stormwater and GIS Services Division of the City's Department of Public Works](#)

GENERAL FINANCING RECOMMENDATIONS

Financing mechanisms should be customized to project based on type of property owner and benefits. Unlike many other types of public benefit infrastructure projects that rely on publicly owned assets on publicly owned land or easements, GI can involve assets owned by different types of organizations on property owned by different types of organizations. There is no one size fits all strategy that is appropriate for all the different asset/property ownership combinations.

Incentivize whenever possible. Incentives come in many shapes and sizes. Many green infrastructure projects are not driven by regulatory requirements and must rely on property owner willingness to invest. If the region wants to see an increase in the willingness to invest in GI across a broad spectrum of property owners, new and expanded financial and social incentives will be needed.

Revise and streamline stormwater credit policy. One of the specific opportunities for increasing incentives lies in stormwater credit policies. Many local governments seen as national leaders in GI have integrated their stormwater fee credit policy into their overall strategy, resulting in policies that have been streamlined and oriented towards promoting green infrastructure. Durham's credit policy as it is currently designed has had relatively little uptake.

Expand pooling. Developing finance and governance systems that increase the numbers of individuals, organizations and properties that are aggregated ("pooled") together will provide a larger resource and benefit base to draw from. Examples of pooling options include continued incorporation of GI costs into existing utilities and tax districts (e.g. Business Improvement District) or the creation of new tax districts (Watershed Improvement District or Special Services Districts).

Continued integration of funding into other local government services. Local government economic development, construction, housing, parking and roadway services are examples of traditional governmental investments that are related to and could include GI Components. An integrated GI finance strategy should include methods of linking GI investments to these services whenever appropriate. For example, many local governments have begun incorporating GI aspects into street construction or repair budgets.

Expand co-funding. In many cases, a single party does not have the financial resources or financial incentives to finance a DGI installation, and successful financing will only occur if multiple agencies and parties can co-fund a project. Durham has exciting examples of co-funding, but more can be done to implement additional projects, even though working with multiple partners can require additional planning and coordination.

Experiment with new mechanisms. Durham has received national attention for its reverse auction program. This is one of multiple types of innovative financing that have been identified. Durham should consider expanding the reverse auction program and pilot other innovative financing strategies such as assessments.

Recognize the non-monetary, non-budget benefits of Green Infrastructure when developing financing plans. While some GI installations result in clear monetary savings to property owners or governmental agencies, relatively few of these installations provide sufficient direct financial benefits to property owners to drive installation without some type of external support. In economic terms, GI benefits

are largely “public goods” rather than “private goods.” Local Government public goods services often require funding from general property or sales tax revenue to flourish.

Elevate some initiatives to capital items in budgets. Expenditures for many types of green infrastructure are often appropriated within operating budgets, and new projects require budget expansion requests and can put the infrastructure in competition with non-project essential operating expenditures. Treating GI exclusively as operating also masks their role as long term infrastructure. For example, tree planting in the Durham budget is generally an operating expense. Other jurisdictions with ambitious tree planting goals include the activity as a capital expense that may be covered by capital finance mechanisms such as debt funding. Some GI will provide benefits for years in the future and using longer term finance mechanisms such as debt allows the costs to be passed on to future beneficiaries. [The EFC at UNC has prepared a guide on GI budgeting that can be found here.](#)

Link Operation and Maintenance to capital costs. Finance strategies for each project should address both capital costs as well as on-going maintenance costs. Green infrastructure efficacy often depends as much on robust operation and maintenance as initial design. Considering operation and maintenance costs when projects may influence technology choice as well as the particular financing strategy.

CHALLENGES TO FINANCING GREEN INFRASTRUCTURE

Diverse regulatory requirements and incentives. Green infrastructure intertwined with regulatory policy and regulations alone will not necessarily effectively drive a comprehensive GI program. Multiple environmental regulatory frameworks with different compliance requirements cover Durham property owners. Green Infrastructure may also be required to meet specific regulatory compliance on new construction or re-development, whereas for existing development, the same installation would only occur on a voluntary basis. The environmental benefit to the community of the installation, whether required by regulations or voluntarily implemented may be exactly the same. In some cases, complying with mandatory requirements may preclude alternative approaches that may cost more but provide much greater environmental benefits or vice versa. Regulatory deadlines for reductions in specific pollutants and limited public resources lead to the prioritization of certain infrastructure improvements that may be more cost effective for those specific pollutants. Other environmental benefits not dictated by current regulations may not be considered as high priority. For example, green roofs are not cost effective for the sole purpose of nutrient reduction and so may not be prioritized as a measure due to regulatory requirement for nutrients.

Many installations occur on private property. Many GI installations or programs that provide substantial public benefits are on private property and/or include privately owned or managed assets. Investing public funds on private property is possible, but poses more problems than if the property was public.

Multiplicity of beneficiaries. Many GI projects and services include multiple attributes and benefits. Benefits include energy savings, water savings, reduced run-off, regulatory compliance, improved aesthetics and improved habitat. While properties hosting GI installations receive some direct benefits, much of the benefits are more community wide than private.

Multiple implementing agencies. Unlike some services that are provided almost exclusively by a single utility or agency, GI services are provided by a range of different organizations with separate budgets, oversight responsibility, regulatory requirements, and purposes. Projects that cut across agencies provide public administration challenges. As highlighted above, having multiple organizations interested in GI is advantageous in terms of co-funding, but can also lead to other coordination challenges.

Operating and Maintenance expense. Some GI financing focuses on capital finance without integrating O&M needs. For example, external grants are available to fund installation costs, but rarely are able to cover on-going O&M needs, which becomes the responsibility of another party. Furthermore, O&M on individual residences can be challenging and costly with oversight needed and property changing hands.

Limited incorporation into capital finance plans. In practical terms, most large ambitious public purpose infrastructure initiatives are included in local government capital budgets and are often funded using debt. GI installations often can be done in smaller phases, and funding for these installations can remain in operating budgets even if the resulting installations are considered assets. This approach can make carrying out very large and ambitious GI programs more difficult compared to large traditional infrastructure projects. There are understandable reasons why small grant programs or distributed improvements do not make it into capital plans, but as a result these services are less likely to be considered for debt financing and may have to compete with other ongoing operation expenditures rather than other types of capital infrastructure.

Weak or non-existent financial incentives. Green infrastructure installations that are voluntary and not driven by regulatory compliance require some type of incentive. Durham, as is the case with most urban areas in the Southeast, provides some limited financial incentives for voluntary GI installations, but these incentives alone are unlikely to drive widespread adoption.

FINANCIAL MECHANISMS

An extremely diverse range of financing mechanisms have been used in the past, or could be used in the future, to fund installations in the region. This paper breaks down the mechanisms into their fundamental building blocks – capital sources and revenue sources. A capital source is where the funds to pay the costs of project come at the time the project is implemented. Revenue sources refer to where the revenue originated from and are linked to who ultimately pays for the project. For example, a bank loan may be a capital source for a project, but the bank itself doesn't really pay for the project – the individuals or organizations that pay back the loan using taxes, fee revenue, or voluntary payments are who really pays. Financial mechanisms are born by creatively matching up different variations of capital sources and revenue sources.

Sources of Capital for Green Infrastructure

Cash on hand. Local governments, organizations, and commercial entities all have access to savings in one form or another and in many cases use this cash on hand to fund a project. Relatively small projects make the most sense, typically.

Local government revolving funds/loan programs. Local governments have the legal authority to appropriate funds that become seed or capitalization funds for loan programs that are used to support

projects serving the public. These funds are commonly created to support economic development and affordable housing, but they could also be created to provide low cost capital to organizations and individuals that may have limited access to commercial debt or who may not be willing to pay commercial rates for a project that they perceive has being largely for public benefit. For example, a conscientious business owner may be reluctant to take out a commercial loan at 8% over 5 to 8 years for a green roof that will reduce run-off along the street, but may be willing to consider using a subsidized loan at 2 to 3% over 10 to 15 years. Orange County offers a local example through its [Small Business Loan Program](#) that supports the growth of local businesses owned by Orange County residents.

A variation of this mechanism referred to as “on-bill financing” has been adopted by utilities as a way to allow utility customers to borrow money for projects and pay them back as a new charge on their bill. Some on-bill programs rely on local government capital as well as bill collection services, while other programs use other sources of capital (see rest of this list), but collect payment using a governmental bill. [The Town of Windsor, CA](#) offers an example of on-bill program used for distributed water improvements:

Clean Water State Revolving Fund (CWSRF) Loan. The North Carolina State Water Infrastructure Authority (SWIA) oversees a number of water and wastewater loan and grant programs. Their largest program is the joint state/federal (EPA) funded Clean Water State Revolving Fund (CWSRF). The CWSRF awarded approximately \$91 million dollars in funds in FY 2013-2014. Local governments can currently obtain loans at rates as low as 0% for 20 years to fund eligible projects including their own stormwater projects, but also for projects with public benefits that they want to support that may be implemented by others on private property. For example, the city could borrow \$500,000 to fund a green roof grant or loan program within their jurisdiction. This is similar to a loan the City of Charlotte has used in the past to fund a toilet retrofit program.

Drinking Water State Revolving Fund (DWSRF) The DWSRF, also managed by SWIA, is similar to the CWSRF in many respects but does have its own unique rules. The most likely use of a DWSRF loan to support green infrastructure project would be to support the purchase of land to create a “green zone” that would directly improve drinking water supply. Given that so much of Durham’s urban streams flow directly into major water supplies, the DWSRF should be considered a viable option as well.

Clean Water Management Trust Fund (CWMTF). In addition to the major State Revolving Funds, other state and federal programs provide capital in the form of loans or grants. These programs have much less capital than the major loan programs, but could be used to support small demonstration projects. The Clean Water Management Trust Fund (CWMTF) is one such program. At one time, the CWMTF had much larger granting resources and had funded stormwater and land conservation projects in many areas. The available resources for this program are greatly reduced and can no longer fund conventional stormwater or wastewater projects, making this a particularly good target for green infrastructure.

Stormwater Utility Grant. Stormwater utilities across the country have begun promoting green infrastructure by using stormwater revenue to fund competitive grant programs. These grant programs such as those operated in Philadelphia, PA and Washington, DC have become an important source of capital for private entities to tap into for projects support. For example, see [Philadelphia’s Stormwater Grants](#) program.

Community Conservation Assistance Program (CCAP) Grant. The [CCAP](#) grant funds green infrastructure installations carried out by the Durham County Soil and Water Conservation District. The

funding program is a cost share program that incorporates state contributions with county and property owner contributions.

Foundation Grants. Many types of foundations and charitable organizations have begun supporting green infrastructure through grant making. Funding green infrastructure strictly through grants generally is not a sustainable financing strategy, but it may be a way to fund some high profile demonstration projects that will attract subsequent sustainable government or property-owner financial support.

Ecosystem Enhancement Program (Mitigation) Funds. Initiatives within Durham, such as the [Third Fork Creek Stream Restoration project](#), have received funds from the state government mitigation program, the [Eco-system Enhancement Program](#). Funding for these projects is a result of another organization or government paying into the fund to offset the environmental damage they caused in other areas of the state.

Stormwater fee backed revenue bonds. Since Durham has a sizable and reliable source of fee revenue, it could also issue stormwater fee backed revenue bonds to fund an ambitious green infrastructure program. Stormwater revenue bonds are fairly common, but have not yet been used by the City of Durham even for traditional stormwater infrastructure.

Water Utility fee backed bonds. The Water Department has a long history of relying on water/wastewater fee backed revenue bonds to fund traditional infrastructure. These vehicles could also be used to fund distributed green infrastructure. For example, the City could use a water utility revenue bond to support the development of institutional-scale water cisterns as an alternative method of investing in water supply.

Assessment backed bonds. Property assessment backed bonds are a relatively new authorized capital source that could be used to fund many types of green infrastructure in Durham. The City or County can develop projects with public benefits that improve private properties and place a tax assessment on the property parcel. The assessment is paid back by the property owner at the time the project is implemented or over time at the discretion of the local government. The stream of assessment payments can be used to repay bonds. These types of bonds are considered revenue bonds and do not require a referendum, but do require property owner petitions. In practice, the City could help fund a massive green infrastructure installation on a commercial or non-profit property, place an assessment on the property equal to the improvement cost, and then use the collected assessments to pay back the bond. This mechanism results in project beneficiaries carrying the full responsibility for the project cost. If assessments are not paid, local governments can foreclose on the property to collect the assessments.

Social impact bonds. Additional creative sources of capital, such as Social Impact Bonds, have not been widely tested but are getting attention. Social Impact Bonds have some similarities to traditional bonds, but there are some very significant differences from the typical local government bond. The design of Social Impact Bonds varies, but the idea is that private investors are provided the opportunity to fund initiatives that provide public benefit and investors are only paid if the project meets established goals. The design allows for creativity, but in a way that manages risk due to the financial implications of supporting projects that don't work. Durham conceivably could issue a green infrastructure impact bond that called for investors to take steps to improve hydrology and manage stormwater as measured by specific metrics, but without specifying the specific technology or approach. See an example of [New York City's Social Impact Bond](#).

General obligation bonds. Durham City or County could issue a general obligation bond that is backed by tax paying capacity of either city or county residents. These bonds do require a referendum, and there are examples of Durham County using general obligation bonds to fund open space and land conservation (a type of green infrastructure). While not common, there is legal authority for the city or county to develop a district within their jurisdiction that would be responsible for paying off the bond rather than the entire jurisdiction. The tax-exempt status of the bond will depend on what the proceeds are used for – if they are used to support improvements on private property the bond is likely not to be tax exempt.

Third party equity linked to public private partnership (P3). Private investors who wish to own assets that generate future revenue may be interested in certain types of green infrastructure. Generally though, most types of green infrastructure promise lower monetary benefits than other types of infrastructure such as toll roads or private water systems, which offer more distinct and reliable revenue streams. However, [Prince George's County, Maryland](#), is currently applying this P3 approach to GI.

Underlying Sources of Revenue for Green Infrastructure

The most important component of any finance strategy is where the underlying revenues originate. These revenue sources are the building blocks for environmental finance strategies and ultimately form the link between the program beneficiary and the service. Durham is fortunate to have a wide menu of potential revenue sources that can be used to repay debt and/or meet on-going operation and maintenance expenditures.

City stormwater fees. The City of Durham has one of the largest stormwater utilities in North Carolina. Under North Carolina law, stormwater fees can be used to cover a full spectrum of stormwater quality and quantity programs. Fees can be used for initiatives that are specifically required by existing water quality regulations, or for initiatives that the city believes will address stormwater quantity and quality programs but which are not regulatory in nature.

New county stormwater fee (unincorporated area). The County Government currently does not have a stormwater fee, but is authorized to create one if so desired. Under North Carolina law, a county fee could only be charged to county property owners who are not currently paying another stormwater fee. So property owners within the City of Durham Corporate limits will be exempt from any stormwater fee that the County develops.

Existing property taxes. Both the City and County have the authority to use revenue from their existing property taxes to cover GI. Both have the authority to informally designate a portion of their property tax, or a proposed property tax increase, as being dedicated to GI.

Sales taxes. Both the City and the County can use existing sales tax revenues to support GI, although neither has the ability to create optional additional sales tax for the purpose of GI.

New municipal service stormwater district tax. The City of Durham has the authority to create districts within its boundaries that are assessed specific district property tax rates based on the services provided in that district. For example, the City of Chapel Hill recently used this authority to create a stormwater municipal service district for a particular area of the city.

Business Improvement District (BID) tax. BIDS are another type of district that can be used to fund initiatives that support downtown areas. Green infrastructure that supports the goal of a business improvement district could be funded using BID taxes.

New County Watershed Improvement District Tax. North Carolina Counties can establish a Watershed Improvement tax. The creation of this tax and how services funded by it may be governed is laid out in the general statutes; however this authority has been infrequently, if at all, used across the state.

New County Special Services District Tax. Like a municipal service district, county governments in North Carolina have the authority to create sub county districts comprised of property owners that benefit from a particular investment.

Watershed Protection Utility Fee. Durham County is already the beneficiary of one of the few specially designated watershed protection fees in the Country. The city of Raleigh has a fee that generates revenue from their customers to support initiatives that improve their water supply, which could include GI installations in Durham County.

Non-designated water or wastewater utility customer charges. Utilities do not need to have a specific separately designated GI fee to direct some of their revenue toward GI. Given the benefits GI can have on water quality and quantity, this revenue from the “basic” water/wastewater utility charge can become a source of funding for GI.

Utility collected donation. Utilities also provide a collection mechanism that can be used to solicit volunteer contributions. Durham has an ongoing *Water to Trees* program that is designed to allow water customers to voluntarily add to their water bill payments to fund tree planting.

Non-profit collected donation. Durham has numerous non-profit environmental organizations that have a history of successfully collecting donations to support environmental initiatives including GI.

Property assessments. Property assessments are one of the most powerful and least used revenue sources for stormwater improvements in Durham and the State. Cities currently have authority to invest in infrastructure on public and private land and attach the cost of the infrastructure to the property through a tax assessment. The city can allow property owners to pay back the assessments over a period of years.

Private property owner direct payments. While this report has focused on governmental finance mechanisms, GI revenues do not need to go through governmental channels. In many cases, direct investments by property owners themselves are the most effective and efficient revenue source. This source can also be leveraged with government-collected revenues.

Impact fees. The public enterprise statutes have been interpreted to allow local governments to collect one-time upfront fees to offset past (or planned future) investments in capital. These fees are collected at the time new construction occurs, and the revenue from these fees can be directed to GI projects that are directly related to the impact of the new development.

Crowd source payments/donations. There has been increased attention in methods of collecting funds from “crowds” through IT applications for specific initiatives. Crowd source platforms such as Kickstarter

have begun to be used to raise funds for specific projects either as low interest loans or direct contributions.

ON-GOING SOURCE OF OPERATION AND MAINTENANCE FUNDS

No infrastructure finance strategy is complete without considering how the operation and maintenance of the infrastructure will be funded. Many of the mechanisms and revenues described above can be used to support operation and maintenance with the major exception that in North Carolina, debt proceeds, regardless of how they are backed, cannot be used to fund operation and maintenance costs. In addition, very few external grant programs are available to fund these costs, making it even more important that projects funded by debt or grants have identified different sources of on-going maintenance funds. In practical terms, the key sources of on-going funds for green infrastructure will include the following:

- Stormwater utility budget (stormwater fees).
- Water utility budget (water and wastewater charges)
- City of Durham General Fund Departmental budget (property taxes, sale taxes and other misc. revenue)
- Durham County General Fund Departmental budget (property taxes, sale taxes and other misc. revenue)
- Private land owner direct payments – “off the book” of the local government budget. One of the defining characteristics of many green infrastructure projects is that they are owned and operated by non-governmental entities. As long as these non-governmental entities follow through on their responsibilities, the costs of operation can be effectively shifted from a governmental budget to a non-governmental budget.

FINANCIAL INCENTIVES

Financial incentives also play a critical role in an overall financing strategy. Many property owners require financial incentives to justify implementing green infrastructure projects. These incentives can range widely from market-based mechanisms to traditional tax incentives. Durham City and County should consider as part of an overall strategy the following examples of more common financial incentives that can increase a property owner’s willingness to support investments in GI:

Reduced stormwater fee payment. Durham currently does not offer GI credits for residential customers. Given the current size of the residential stormwater fee in Durham, it is unlikely that stormwater fee credits alone will drive GI installation. However, even a small symbolic financial incentive may be enough to attract the attention of some homeowners. Non-residential customers including large governmental institutions (e.g. schools) and commercial entities (shopping centers with parking lots) do have an avenue for fee credit and pay considerably more in stormwater fees. Providing a more substantial incentive for these types of customers is more effective, although the discount itself would not provide sufficient funds to support GI installation.

Reduced water purchase. Some GI such as landscaped rain gardens and rain cisterns can reduce a property owner's potable water needs and lead to increased savings.

Reduced energy bills. Some green roofs or vegetation/tree planting on southern exposure can reduce cooling loads that translate to reduce energy bills.

Increased property value. Green infrastructure installations that bring aesthetic improvements and reduced utility bills (energy, stormwater) can make a property more desirable and lead to increased property value.

Increased commercial value. Some business have begun branding themselves as "green" as way to attract clients with environmental interests.

Other development incentives. Other incentives that ultimately have a financial benefit, like density bonuses for green Low Impact Design, have been used to incentivize the integration of GI into new development or re-development efforts. Tax incentives are also a possibility that some states are exploring for encouraging private investment in DGI.

CONCLUSION

Durham County has many options for financing GI. The strong financial position of The County and City (both triple A rated governments) provides a starting point for many local government finance mechanisms, but ultimately the success of any finance mechanism depends on widespread community support. If GI becomes a community wide priority that individuals and governments are willing to pay for, the toolbox will be full. No finance strategy, regardless of how creative, can support infrastructure that is founded solely on an interest without a willingness to pay.