

# ENVIRONMENTAL IMPACT BONDS:

## Lessons Learned in the Chesapeake Bay



CHESAPEAKE BAY  
FOUNDATION

Saving a National Treasure

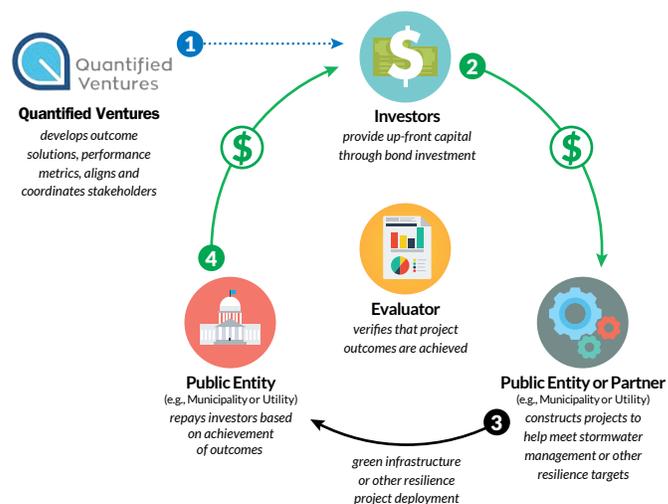
### Investing in Green Infrastructure to Save the Bay

Stormwater is a growing source of pollution in the Chesapeake Bay watershed and represents a significant challenge to meeting Bay cleanup goals by 2025.

To help local governments tackle this pollution, the Chesapeake Bay Foundation (CBF) partnered with outcomes-based capital firm Quantified Ventures (QV). The idea was to structure Environmental Impact Bonds (EIBs) to finance green infrastructure projects in cities in the Chesapeake Bay Watershed. These projects can include bioswales, rain gardens, constructed wetlands, pervious pavement, and green roofs that naturally slow the flow of stormwater from urban landscapes.

**The bonds use a Pay for Success financing model to support projects that achieve environmental and socio-economic goals in Bay communities.**

### The Pay for Success Model



In other words, cities pay for what they get. If a project is extremely successful and overachieves its goals, repayments are higher to reflect the higher value of the project to the city. But if a project falls short of its goals, repayments are lower. EIBs therefore allow local governments to share project risks with investors who care about environmental and social outcomes. They also provide a way for both investors and cities to measure a project's impacts and highlight those impacts to constituents.

## Current Projects

QV worked with the DC Water and Sewer Authority to issue the first-ever EIB in 2016, which financed green infrastructure to address stormwater-induced sewage overflows into local rivers during heavy rainstorms. Following this model, CBF and QV set out to expand the use of EIBs for green infrastructure in the Chesapeake Bay Watershed.

CBF and QV made about 45 presentations on EIBs to municipalities, universities, and utilities in Maryland, Pennsylvania, and Virginia, resulting in partnerships with the cities of Baltimore and Hampton.



## Hampton, Virginia

The City of Hampton is exploring the use of EIBs to finance several pilot projects from its Resilient Hampton initiative, which focuses on strengthening the city's ability to cope with the effects of climate change. The city is identifying and will be designing green infrastructure projects that reduce localized flooding in Newmarket Creek, an area that includes Hampton's central business district, Langley Air Force Base, and several residential neighborhoods.

CBF and QV are providing technical assistance to Hampton as it moves proposed projects through the city's regular capital-planning and budgeting process. Once projects have been adequately identified and profiled, CBF and QV will work with Hampton to identify an appropriate outcome metric and bond structure.

## Baltimore, Maryland

Baltimore will use EIB financing to construct 115 bioretention facilities, remove impervious surfaces, and restore streams to help meet its stormwater permit requirements. These projects represent a significant increase from the handful of green infrastructure pilot projects installed in the city to date.

The bioretention facilities—areas designed to trap and filter stormwater runoff with plants—will be installed on city-owned residential streets, public school grounds, and neighborhood parks. In addition to improving water quality, these areas can beautify neighborhoods and public spaces and can even increase property values, according to the Environmental Finance Center at University of Maryland.

Total project costs are estimated at \$17.8 million. The proposed EIB is expected to fund \$6.2 million for construction. The city will use Maryland State Revolving Funds (SRF) to pay the remaining balance.

## OUTCOME METRIC

Baltimore chose “plant survival” as the outcome metric that measures project performance and determines how much the city repays investors. Plants are a key element of bioretention facilities because they clean pollutants, slow stormwater overflows into waterways, and improve filtration of water into the soil, leading to better water quality. Greater plant survival is therefore indicative of greater efficacy of the green infrastructure.

Replacing dead plant materials also increases the city's ongoing operation and maintenance costs. Baltimore designed its EIB to share the risk of these operation and maintenance costs with investors. The city also wanted to learn how to best manage operation and maintenance costs for small-scale green infrastructure practices in advance of implementing its Green Network Plan, which aims to create interconnected green spaces throughout Baltimore.



## Outreach and Lessons Learned

Many communities were not able to participate in our EIB initiative because they did not have shovel-ready green infrastructure projects. We required shovel-ready projects due to our goal of financing the projects within one to two years of starting work with a community. Additionally, some cities had already planned how to finance their green infrastructure projects and did not have the flexibility to change their approach.

The discussions nonetheless proved fruitful. A number of cities indicated initial interest and saw the advantage of utilizing an EIB to link payments to project performance. Our outreach efforts also allowed us to collect information on the readiness and ability of municipalities to engage with this new financing tool and provided key lessons, described below.

### LIMITED EIB EXAMPLES

**Challenge:** At the start of this project, only a single EIB (DC Water in 2016) had been issued.

DC Water used the EIB to meet regulatory requirements (e.g. combined sewer overflows) that were not applicable to most municipalities we contacted. Understandably, municipalities fixated on these differences and were often unable to imagine a model that would apply to their local priorities.

**Takeaways:** With the issuance of a green infrastructure EIB in Atlanta, Georgia, and pending issuances by Baltimore and Hampton, municipalities will soon have more models to use to gauge whether an EIB is appropriate for their own situations.

## FOCUS ON MORE THAN REGULATORY COMPLIANCE

**Challenge:** In the Chesapeake Bay, local governments do not receive more “credit” for better-performing stormwater management practices.

The Chesapeake Clean Water Blueprint, the federal-state plan to clean up the Bay, sets enforceable pollution reduction goals by 2025. Municipalities must comply with stormwater permits, creating a strong regulatory incentive for infrastructure projects that improve stormwater management. However, municipalities get pollution reduction credit based on the completion of a stormwater project—not how well that project performs. This removes an incentive to participate in EIBs, which reward projects for performance.

**Takeaways:** Because the regulatory framework does not reward performance, cities must identify and value other green infrastructure benefits when selecting projects for EIB financing. Baltimore and Hampton were not only focused on meeting permit requirements, but also valued risk transfer and green infrastructure co-benefits. An EIB can allow government leaders to manage variability in attainment of these additional outcomes.

## PLANNING AND BUDGET CYCLES

**Challenge:** By the time projects are shovel-ready, municipalities have generally also planned how they will pay for them.

CBF initially considered only cities with “shovel-ready” green infrastructure projects. However, municipalities plan infrastructure projects in tandem with budgeting and financing, often as part of their annual Capital Improvement Plan. Large cities with larger budgets may have an easier time changing how they finance projects mid-process, but this is not the case for small cities.

**Takeaways:** Engaging municipalities in earlier stages of the project planning and budgeting process might increase use of EIBs.

## MUNICIPAL CAPACITY AND FINANCING NEEDS

**Challenge:** An EIB issuance generally requires about a \$3 million minimum project size, which many municipalities in the watershed could not meet.

Because most municipalities in the Chesapeake Bay watershed are small, their stormwater budgets and financing needs are also relatively small. The EIB model is still a new tool for financing green infrastructure; at this point in its development, it may not yet be an efficient fit for this type of local government.

**Challenge:** The municipalities we approached have not traditionally relied on outside financing for their stormwater infrastructure.



Instead, the municipalities prefer to use their general fund, stormwater fees, or grants to meet stormwater permit requirements. However, stormwater management costs will grow under future permit requirements, and we believe that municipalities will not be able to solely rely on these sources of funds. It is helpful to develop alternative models of financing now, that other municipalities can reference in the future.

**Takeaways:** While municipalities can meet current stormwater requirements “out of pocket,” as requirements become more stringent and costlier over time, municipalities will increasingly require outside financing and may benefit from financing tools that link payments to project performance.

## OTHER FINANCING OPTIONS

**Challenge: Municipalities have access to State Revolving Funds (SRF) and other sources of low-cost capital for stormwater management and green infrastructure.**

In Virginia, Maryland, and Pennsylvania, municipalities can borrow money for stormwater infrastructure through SRF loans at 0-1% interest. Cities strongly favored the lowest cost of capital in the short-term. Nonetheless, these loans are not always available and are not used as widely as might be expected due to a sometimes-cumbersome application process. Further, unlike EIBs, payments on SRF loans are not tied to project performance, giving EIBs a possible cost advantage over a longer time frame.

**Takeaways:** Cost advantages from EIBs result from sharing the risk of project performance with investors and compound in the long term, after municipalities apply

lessons learned to future projects and accrue cost savings over time. Municipalities may or may not value the longer-term benefits over the short-term savings from state low-interest loan programs.

Further, SRF administrators in some states are open to a blended financing approach, creating opportunities to combine an EIB with SRF funds to bring down the cost of capital while linking payments to outcomes, as Baltimore is doing.

## Moving Forward

EIBs have provided a visible way for governments to communicate to the general public their work on environmental priorities. We found that EIBs have the most impact when they accelerate work that was earlier initiated on a small scale at the local level, such as DC Water and Baltimore’s push to scale up green infrastructure practices or Hampton’s efforts to develop and implement a climate change adaptation plan. In short, timing is critical to EIB adoption.

Innovative financing tools like EIBs can make it easier for municipalities to move forward with green infrastructure projects and justify more investment in creating a “pipeline” of ready projects, which is essential for meeting challenging stormwater management goals. More resources should therefore go toward improved up-front planning for stormwater management projects that incorporate green infrastructure, so cities are better able to take advantage of whatever funding opportunities best fit their needs.



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