



Bourne, MA Coastal Resilience Financing Assessment

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Executive Summary. In 2019, the US Environmental Protection Agency awarded a five-year cooperative agreement to the New England Environmental Finance Center (New England EFC) at the University of Southern Maine to establish a technical assistance network to support the work of multiple partner organizations that provide training and assistance to municipalities, organizations, and tribes across the region. The purpose of the network is to advance stormwater management, ecological restoration, and climate resilience within Rhode Island and southeastern Massachusetts. An important overarching component of the network is to create sustainable revenue streams and financing processes in support of local implementation efforts into the future.

The Southeast New England Program (SNEP) Technical Assistance Network is comprised of over 15 different partner organizations from across the region, thereby offering a full complement of technical and financial services to communities in support of leadership development and peer-to-peer learning. The Network's collective goal is to bring about a broader understanding of the impacts of stormwater facing the community, and to overcome implementation barriers through capacity building and innovative financing systems.

Background. The anticipated impacts of climate change are well documented, and the implications for coastal communities like Bourne, MA are significant. The increased infrastructure requirements that will be necessary for Bourne to adapt and thrive in increasingly difficult conditions will require financial investments well beyond the town's current fiscal capacity; and Bourne, as well as the entire Cape Cod region, is not alone. The 2018 National Climate Assessment notes that coastal zone communities account for nearly half of the nation's population and economic activity, and that cumulative damage to property in those areas could reach \$3.5 trillion by 2060.¹ The good news is that investing in adaptation and resilience can be highly cost effective. The challenge of course is to establish a funding and financing system capable of supporting infrastructure investments. The purpose of this financing assessment tool is to provide local leaders with a clear understanding of resilience financing needs and to expand capacity to address those needs.

Assessment Overview. Through the support of SNEP and US EPA, the Climate Resilience Financing Assessment project team worked in direct partnership with Bourne, MA leaders to address stormwater impacts within the context of a changing climate. The goal of the project is to provide local leaders with a financing plan of action to address civic and stormwater infrastructure needs into the future. This assessment was designed to enable communities like Bourne to identify the conditions necessary for effectively financing critical infrastructure needs. The assessment is structured within two broad categories:

- Defining resilience, assessing risk, and planning for the future; and,
- Creating a resilient financing system.

Within each of these two categories, the project team created a series of assessment questions designed to create a more thorough understanding of local capacity to move

¹ <https://phys.org/news/2018-12-climate-resilience-trillions-runbut-billions.html>. Last accessed on 11/27/19.

infrastructure projects through the financing system. The result will be financing action plans that are scalable, sustainable, and adaptive over time.

A unique aspect of resilience is that the impacts—especially stormwater impacts—associated with climate change will evolve and intensify over time. As a result, the risks to community infrastructure, as well as the services necessary to mitigate those risks, will need to evolve also. This of course means that the resilience systems and processes, including financing processes must be dynamic. To that end, this assessment considers three different time horizons: short-, mid-, and long-term:

Short-term risks and infrastructure need. Short-term risks and infrastructure need are those present in 0-3 years. Essentially, these represent immediate infrastructure and financing needs. The assumption is that infrastructure and programmatic needs that fall within the time horizon have been identified and addressed in existing planning documents and processes. The financing components necessary for addressing short-term infrastructure needs include:

- Codified, stable funding streams, whether they be supported by general obligation bonds and general funds or through enterprise programs and dedicated fees; and,
- A clear understanding of the project's useful life, i.e., how long the project will sufficiently address changing resilience needs.

Mid-term risks and infrastructure needs. Mid-term risks and infrastructure needs are associated with impacts that will occur within 3-15 years. These are the infrastructure systems that will replace or augment existing short-term infrastructure. Given the increase in climate change impacts over time, it is likely that the scale of infrastructure needs and financing resources necessary to meet those needs will grow over time. Revenue streams in support of mid-term infrastructure needs are not necessarily required immediately, but efforts should be made to establish the processes necessary for generating revenue and investment in the future.

Long-term risks and infrastructure needs. Long-term risks and infrastructure needs, i.e., those that will occur 15 years and beyond, will be required to address the most significant impacts associated with climate change. This includes major infrastructure projects required to address sea level rise, changes in temperature and precipitation patterns, and catastrophic storm events. Given the anticipated scale of the need, it is important for community leaders to begin establishing the necessary financing systems and processes in the short-term with a vision towards long-term. This includes establishing the conditions necessary for investment, identifying anticipated revenue streams, and building capacity by establishing appropriate financing institutions.

ASSESSMENT PART I: DEFINING RESILIENCE, ASSESSING RISK, AND PLANNING FOR THE FUTURE

The resilience financing process begins with a clear vision for the future. A comprehensive, consensus-driven resilience vision and implementation strategy provides a framework for financing and investment. Local and regional leadership is essential to attract and deploy investments in resilience efforts. Advancing resilience priorities, including embedding those priorities into the economic fabric of the community will require engaging and informing community leaders charged with moving resilience initiatives forward. The first step in the resilience assessment process is to understand what resilience is, what the threats to the community are, and the appropriateness of plans for becoming more resilient in the future.²

DEFINING RESILIENCE. A critical step in the planning process is to define resilience in a way that is community-specific and reflects the anticipated risks, future goals, and expected outcomes of its citizens. This process focuses on three key questions: what is needed, what is valued, and what are the necessary systems.

Community Assessment:

Is there a clear existing community-based definition of and vision for resilience that considers environmental, economic, and social resiliency? Bourne does not yet have a single, clear, community-based definition for resilience. While Bourne’s recently completed Hazard Mitigation Plan (HMP) and Local Comprehensive Plan (LCP) certainly address resiliency, these plans do not define it in a uniform and community-specific way. The LCP description aligns most closely with Bourne’s vision for resilience, stating, “the coastal resiliency goal of the Town of Bourne is to minimize and mitigate the effect of sea level rise, increasingly frequent and severe storms, and other climate-related hazards on the town’s residents, economy, and infrastructure” (LCP 41). The community has noted that the Town would welcome a clear definition for resilience that reflects its vision, and the Select Board has expressed openness to developing one internally.

ASSESSING RISK. Key to the resilience planning process is assessing the risks the community will face into the future. A major component of this project is to enable communities to be more resilient to the impacts of climate change. However, resilience requires addressing risk and potential impacts across multiple media and potential community needs, including:

Climate change impacts: The impacts of climate change will be varied. In coastal communities these changes will likely include coastal flooding; sea-level rise; intensified storms; drought; heat waves; changes in distribution of disease vectors; and displacement and migration.

Other environmental crises: Part of the financing challenge facing coastal communities is the interaction between climate change adaptation and other environmental needs, specifically as it relates to water quality restoration and protection. For example,

² Island Press and The Kresge Foundation. 2015. Bounce Forward: Urban Resilience in the Era of Climate Change. <https://kresge.org/sites/default/files/Bounce-Forward-Urban-Resilience-in-Era-of-Climate-Change-2015.pdf>.

stormwater management in Bourne will have tremendous impacts on the community in the future, both physically and financially. In turn, climate change will have a tremendous impact on stormwater management efforts. **This means the two issues must be addressed collectively.**

Economic changes: Much of the focus on mitigating the impacts of climate change has focused on the infrastructure necessary to address physical threats to coastal and urban communities. The potential economic changes— good and bad—must also be understood and addressed. For example, the rise or collapse of key industries; changes in financial or regulatory systems; and changes in wealth distribution can have tremendous impacts on local economies. While these impacts will often occur outside the framework of climate change, the reality of a changing climate will almost certainly be an influencing factor.

Social risks: In addition to complex and interwoven environmental and economic challenges, there are also social challenges. Environmental and economic crises introduce new or exacerbate ongoing social issues, putting already marginalized populations at further disproportionate risk. In order to truly address resilience, communities must consider how they will ensure their most at-risk populations are protected and strengthened.

Community Assessment Questions:

- ***Has the community completed a comprehensive risk assessment? Are the potential impacts of climate change on cultural, economic, social, environmental, and physical infrastructure assets well understood?*** Bourne has a good understanding of the hazards the community is facing. The Town completed an assessment (HMP Ch. 2) of the natural hazards that the community is currently facing -- these hazards are coastal erosion and shoreline change, flooding, hurricanes and tropical storms, nor'easters, high winds, severe winter weather, and sea level rise. Some information is still needed on threats that could compound due to climate change (e.g. forest fire, invasive species).

More information is needed on the specific assets that are vulnerable to these hazards. While the HMP consists of a general vulnerability assessment, data for specific individual assets is still limited. Data is also unavailable for detailed vulnerability and risk assessments related to nor'easters, high winds, and severe winter weather. Bourne is working to fill these information gaps related to assessing vulnerabilities. More information on financial valuation of assets (both public and private) would be very beneficial to the town.

In working with Bourne, the project team has considered that the town could benefit from a standardized method to calculate the extent of an asset's vulnerability, as well as its magnitude and probability of loss.

PLANNING FOR THE FUTURE. It is necessary to have a resilience plan in place that focuses on anticipated infrastructure needs before a financing plan can be developed. As with resilience financing, the resilience planning process is unique to each community and must enable local leaders to address their unique resilience issues. The planning process is founded on an analysis of existing community systems. Key planning assessment processes include:

Creating diversity and redundancy. A community with many different planning components and processes will have a wide range of responses to change and stress. For example, a municipality with a diverse economic base is less vulnerable to economic upheaval than one that relies on a single industry. In governance and decision-making, a collaborative process that incorporates a variety of actors and perspectives is likely to produce better outcomes.³ Similarly, a resilient community will have planned redundancies as a way to perform basic functions so that the failure of any one component does not cause the entire system to crash. This is important when addressing climate change impacts such as flooding, sea level rise, and catastrophic storm events. Planned redundancy is important and leads to more resilient systems. Unplanned redundancy can lead to inefficiencies and increased costs.

Promoting equity and inclusiveness. The planning process is typically associated with guiding land use and infrastructure development needs and issues. While this is important, especially in the context of financing climate change resilience, long-term resilience will also require an equitable, inclusive planning process. Planners must be acutely aware of spreading anticipated risks and opportunities equally.

Proactively planning for innovation. Resilient communities must develop new and innovative responses to risk and changing conditions. The capacity to innovate derives from many of the qualities just described. Diverse systems generate more opportunities for innovation than uniform ones. In social systems, innovation often comes from the margins. An inclusive society is better able to engage the agency and creativity of all of its citizens.⁴

Community Assessment Questions:

- ***Do planning documents and processes provide short-, mid-, and long-term strategies to address resilience and desired outcomes?*** Bourne is still working to establish the necessary components, processes, and people in place for organizing and prioritizing action steps, especially those in the short-term. Current town leadership aims to be proactive in its approach and seeks to emphasize efficiency in carrying out these action steps.

Continuing challenges here relate to prioritizing, with limited staff capacity and gaps in standardized prioritization methods. In recent years, staff have found successes in overcoming these challenges and have taken action on multiple important projects (e.g., MS4, Comprehensive Wastewater Management Plan). While projects and challenges remain, the current town leadership is in a good position to address these challenges. Assistance with prioritization methods will further enhance the staff's capacity.

- ***Has the community identified and inventoried the cultural, historical, economic, social, environmental, and physical assets that are valued in relation to resilience?*** Bourne has completed an asset inventory (HMP Ch. 3) that is considered one of the most helpful components of the HMP. However, the list of at-risk assets will need updating, as the flood zone has changed since the HMP's completion in 2017. The HMP inventory is

³ See Intersector Project: www.intersector.com

⁴ Bounce Forward report produced by the Kresge Foundation and Island Press. Citation: *Bounce Forward: Urban Resilience in an Era of Climate Change*. A Strategy Paper from Island Press and Kresge Foundation

mostly generic, in that it identifies assets by type; a more individualized asset inventory would be useful.

The 2007 “Study of Flood Hazard Mitigation and Design for the Main St. Business District” also inventories parcels and buildings in the downtown area. The Town is currently undergoing a project with allocated funding for asset management/automated facilities maintenance that will provide some up-to-date information on certain assets. The Cape Cod Commission’s (CCC) Coastal Planner Tool serves as a potential resource to identify at-risk assets and their values. A comprehensive asset assessment would be helpful in developing a sense of all of the town’s infrastructure and properties.

REGULATORY EFFECTIVENESS. Regulations are an important component of the resilience financing and economic development process. Regulatory procedures, policymaking, and code enforcement provide local governments with an opportunity to directly impact the infrastructure and resilience financing process. Perhaps the most important regulatory task faced by local leaders is to ensure consistency.

The connection and consistency of regulations to resilience and economic development efforts is especially important in regard to the financing process. Contrary to the widely held position that regulations suppress economic development and fiscal processes, regulations are often the first line of efficiency in the financing process. Regulatory consistency applies across communities. It is not the absence of regulation that facilitates economic development, but rather the assurance that regulations will stay consistent across the region. This is especially important for regional economic development and planning efforts. Resilience implementation in communities like Bourne must be founded on local vision and priorities, but implementation efforts require regional engagement in the long-term. Consistency among regulations is essential.

There are multiple regulatory issues related to building codes, land use and zoning, and stormwater management that are necessary to ensure a resilient community. Regulatory issues related to these and other identified elements and the processes and institutions necessary for ensuring regulatory consistency must be part of any comprehensive long-term resilience plan. One example is the increasingly stringent stormwater management regulatory process. As with planning capacity, there are multiple regulatory layers—local, regional, and state—that impact key resilience issues such as stormwater management regulations, which are implemented primarily through state and county level regulatory processes. Stormwater regulations are quickly evolving from local flood control mechanisms to more comprehensive water quality restoration and protection systems. This evolution closely mirrors the connection between stormwater quality, quantity, and resilience within coastal communities.⁵

⁵ Advancing Resilience-Supportive Economic Development on Virginia’s Eastern Shore. September 2017. A Report by the Environmental Finance Center, University of Maryland.

Community Assessment Questions:

- *Are regulatory, planning, and implementation activities carried out in coordination and in synchronization?* Bourne has a good foundation for collaboration, as various staff workgroups and teams (specifically in the planning process) often collaborate and discuss the intersections of broader issue areas. In looking to further optimize coordination, engaging departments responsible for project implementation and maintenance (e.g., Department of Public Works) is an opportunity for additional success.

The Town's individual plans and policies tend to reflect the LCP and are consistent with each other. However, these plans remain broad in scope, with less specific actionable strategies and/or projects for individual resilience, stormwater, and other key issue areas. As Bourne continues to refine its processes for prioritization and financing, this coordination will further improve.

RECOMMENDED NEXT STEPS:

- *Create a community-wide understanding of the infrastructure, economic, and social systems that will need to be put in place to realize the community's resilience vision.* Establishing a resilience "vision" for the community will be effective only if there is a systemic approach to implementing the policies, programs, and infrastructure investments that will make that vision a reality. Very simply, there needs to be a very clear plan of action moving forward; we strongly recommend that one of Bourne's first steps towards resilience should be to create this outreach plan. This requires expanding the Bourne Municipal Vulnerability Program report and build upon this as a starting point with the next steps to include a community supported climate resilience definition. The information the SNEP Network project team included in the Toolkit can be the starting point by which specific details on priorities, targets, metrics, actions, costs, and potential funding sources are added.⁶ This can be done internally by the Town of Bourne or with a contractor who can support the outreach component.
- *Develop a Continuity of Operations (COOP) Plan for all departments within the Town of Bourne and not just for a select few, such as police and fire.* Local governments must have plans for maintaining all critical services during incidents that threaten to disrupt normal operations, such as natural disasters caused by climate change. Having regularly updated best practices as a planning guide for local government to use in a case of emergency is essential. It lays out delegations of authority, orders of succession, protection of vital records, communications plans, and alternate location planning. A COOP plan describes town functions, associated personnel and resources, and processes for protecting and maintaining those functions, personnel and resources. It also serves as one of the foundational elements in resilience planning. Guidelines, standards, and templates are readily available online and are considered essential documents for the Federal Emergency Management Agency (FEMA) and other federal and state agencies who encourage COOP planning for all levels of governance. The next steps would be to assign department leaders to submit their department COOP plan

⁶ <https://www.mass.gov/doc/bourne-report/download>

using an approved template. Someone of high rank within the town should be tasked with reviewing and signing off on approved plans.

- *Develop and refine community planning to address the diverse nature of resilience, thereby encompassing environmental, social, and economic issues.* Community plans should explicitly address the connections between these three issues. In fact, creating these connections and linkages can have a very high return on investment by eliminating redundancy in the planning and implementation process. This is extremely important in regard to resilience given the anticipated broad, widescale impacts on coastal communities like Bourne.

The purpose of this assessment is to focus specifically on financing processes; therefore, planning efforts should address those issues that are expected to have the most significant impact on local resilience moving forward. Specifically, initial focus should be on water-based resilience: stormwater management; flood control; disaster preparedness; and, shoreline protection. There are certainly other environmental funding and financing priorities that Bourne officials must address, such as wastewater management and reducing nutrient emissions. The Town's financing strategy should ensure that addressing water-based resilience is done in concert with broader water quality restoration funding and financing programs.

ASSESSMENT PART II: CREATING A RESILIENT FINANCING SYSTEM

The planning and visioning processes described above provide a foundation for developing and implementing a financing system that directs capital and investment in the most efficient, effective, and sustainable manner possible. The challenge for financing large-scale infrastructure efforts is clear, especially in coastal communities. The potential scale of achieving resilient infrastructure implementation goals can appear overwhelming. This is exacerbated by the comprehensiveness and breadth of the infrastructure needs themselves. Retrofitting communities to be more resilient and adaptive to climate change as well as other social, economic, and environmental stressors, requires significant investment above and beyond existing infrastructure financing needs. As a result of the complexity of the resilience financing challenge, it is essential that communities develop innovative and scalable resilience financing institutions and systems.

This part of the assessment process is intended to inform and aid local leaders in their efforts to create the enabling conditions necessary for investment and financing to occur at scale. We recognize that the issues and recommendations we are making in the following sections of this assessment are significant, complex, and will require equally significant and complex conversations among community leaders and citizens to resolve. Financing systems must be designed to aid local leaders to make some very difficult and nuanced policy decisions. For example:

- Balancing cost and benefit. Resilience infrastructure projects, especially those designed to anticipate and mitigate future climate impacts require balancing very significant short-term costs with equally significant long-term gains. Unfortunately, it is very difficult to transform avoided costs into cash flow, which again puts significant pressure on local revenues.
- Achieving fairness in the financing system. Fairness in regard to infrastructure financing assumes that the cost burden reflects the benefits received from a project. This is often difficult to achieve when public revenues are creating significant private benefit in very specific places.
- Ensuring equity in the financing and implementation process. Similar to fairness, achieving equity in the financing system has the potential to complicate resilience efforts. The ability to pay is a persistent issue in regard to infrastructure financing, and it is often at odds with achieving fairness.
- Expanding cooperation. Finally, effectively addressing climate change will require a level of cooperation both within and outside local governments. As a result, financing systems must function within a more complex system that includes intra-community collaboration among agencies (planning, budgeting and finance, operations, legal) as well as inter-community engagement and implementation (local-state-federal).

Because of the long-term nature of the climate resilience issue, there may be the temptation to defer difficult political and policy discussion to another time. We believe, however that that would be a mistake. The most productive reforms in local finance occur

in small increments over a long period of time.⁷ Therefore, it is not the responsibility of current leaders to address the entirety of the local resilience challenge, but rather to establish the systems and iterative processes that will serve as the foundation for future leaders to build upon. By immediately establishing a clear set of resilience policy and investment criteria that are widely shared by the community, a foundation for long-term success will be established. To that end, the following assessment addresses the core elements and components of a public financing system: institutional capacity; tax base and revenue streams; financing mechanisms; and, procurement systems. We begin with a brief assessment of Bourne's existing local financing capacity.

EXISTING LOCAL FINANCING SYSTEMS. Clearly addressing the widescale economic, social, environmental, and fiscal impacts of climate change will require consistent and long-term adaptation and innovation within the infrastructure financing system. This in turn requires a foundational capacity at the local level to establish new financing processes.

There are any number of ways to assess the capacity of local governments and public institutions to successfully finance infrastructure needs, but one of the most important and effective are the credit ratings developed by the major rating institutions: Standard and Poor's (S&P) and Moody's. Recently S&P Global provided a rating of approximately \$5.4 million 2020 general obligation (GO) municipal-purpose loan bonds issued by the Town of Bourne. In short, S&P Global assigned its 'AA+' long-term rating to the bonds while at the same time affirmed its 'AA+' long-term rating on the town's existing GO debt.⁸ The AA+ rating is one step below S&P's highest rating, which is AAA. Though there are some possible concerns related to long-term financing obligations related to pension requirements, the town's outlook is "stable."⁹ The AA+ rating is an important indicator that the community's existing financing capacity is relatively strong. Going a bit deeper into the analysis provides some important insight into how that capacity will serve as the foundation for a resilience financing system in Bourne.

First, the rating report addresses Bourne's *strong economy*. Clearly, the stronger the local economy, the stronger the local government's revenue base. Efficient, effective, and prudent budget and investment choices leads to a stronger economy, which leads to more stable, sustainable revenue yields and thus to less budget volatility.¹⁰ It's certainly a virtuous cycle. Therefore, good financing, tax, and budget policies make for good economics. Of course, the inverse is also true. The connection between the town's strong economy and the sustainability and success of its current financing systems perhaps more than anything else defines the importance and primary motivation of the resilience financing system. Climate resilience is focused on protecting local assets and economies, which in turn protects and strengthens the community's financing and budget processes. Again, a virtuous cycle.

The ratings report also addresses Bourne's *very strong financial management*, as well as strong financial policies and practices. In addition, the town has a strong budgetary performance, with slight operating surpluses in the general fund and at the total

⁷ Bland, Robert L. *A budgeting guide for local government: third edition*. 2013. Page 5.

⁸ Ibid

⁹ Ibid

¹⁰ Bland, page 3

governmental fund level in fiscal 2019. Well-designed budgeting and revenue structures that promote fairness and is administratively cost-effective—is an effective tool for attracting and retaining business investment and maintaining a strong economy. Effective local budgeting and financing processes also ensure local support and confidence in local funding processes. Again, this will be very important moving forward as the town addresses resilience infrastructure needs and requirements. The S&P rating report addresses several other strengths associated with Bourne’s financing processes; in short, the Town is well-positioned to develop and advance a resilience financing process.

Community Assessment Questions:

- ***Has the community effectively identified how existing systems will need to be adapted and what will be needed outside of existing systems to establish an appropriate sustainable and scalable financing system?*** Most of the Mitigation Actions in the HMP either explicitly call for or require funding versus financing. To this point, the town will need more information regarding the systemic changes that will be necessary to facilitate sustainable resilience changes. This information need is common, as many communities facing climate threats are tasked with adapting in multiple different directions. The process of identifying how systems will need to adapt will likely become clearer as Bourne and the SNEP Network work together to refine the prioritization process.
- ***Has the community considered innovative financing options that could draw in outside capital and investment for resilience infrastructure?*** The town has traditionally relied on funding in the past, applying for grants and/or employing the General Fund for most of its projects. However, there is certainly an appetite for discussion of innovative financing mechanisms. Bourne’s current leadership is open to and requesting innovative financing approaches to resilience and stormwater projects. CCC reports produced for Bourne (see 2019 Bourne Economic Summit Report) have recommended innovative and sustainable financing options such as District Improvement Financing (DIF), Tax Increment Financing (TIF), etc. Bourne would benefit from more information on innovative financing options; this serves as an opportunity for SNEP to engage with Town leadership and work together to consider the innovations Bourne could potentially champion.

INSTITUTIONAL STRUCTURES AND CAPACITY. A foundational component of a functioning infrastructure financing system is institutional capacity. Public institutions are the organizing mechanisms within financing systems. Institutions ensure that rules, regulations, and codes of conduct are enforced, thereby enabling the participants in the financing process to trust the veracity of the system. They establish and manage the procurement processes that public agencies rely on to build, operate, and maintain infrastructure. Institutions provide structure to innovative approaches for advancing innovation and ingenuity within the public financing sector. In short, institutions will create the enabling conditions that are necessary for resilience financing processes to function effectively.

The anticipated climate impacts to the Town of Bourne will be significant and varied across the community, which suggests that a new, innovative and scalable financing system will be

necessary to address the community's infrastructure needs in the future. A central component of this resilience financing system will be institutional capacity. And as long-term environmental, economic, and social resilience needs become increasingly complex, it will be necessary to expand institutional structures and capacity appropriately. There are a variety of ways that institutions can be structured and capitalized; their purpose in the financing process is relatively universal:

- Mobilize public and private capital. Perhaps by definition, the primary role of financing institutions is to ensure sufficient investment, from either public or private sources, in resilience and civic infrastructure. This will require identifying and leveraging a variety of funding and revenue sources.
- Incentivize investment in infrastructure. In addition to receiving and managing diverse revenue streams, financing institutions apply and utilize a variety of financing mechanisms including bonds, originating loans, and perhaps facilitating grants. In short, institutions must provide long-term financing primarily in the form of tax-free revenue and conduit bonds.
- Accelerate infrastructure development and construction. Finally, a dedicated financing institution should be enabled to make existing design, permitting, contracting, and construction processes more efficient and effective. This will require serving as an organizational or focal point of a number of public agencies, departments, and processes. In other words, the financing institution in many ways becomes an important organizing element of the policy development and project investment process.

There are multiple ways to structure a resilience financing institution; we focus on two specifically: 1) establish an internal resilience department/agency/entity or enterprise program; or, 2) establish publicly chartered independent resilience financing institution.

Internal financing institutions can take a variety of forms, but two are most common: a fee-based enterprise funds (water, wastewater, stormwater for example); or a financing agency as a component unit of the government. Internal institutions can be established with the capacity to receive multiple sources of revenue, as enabled by local leadership and elected officials. Though enterprise funds are supported primarily, if not exclusively through the generation of service fees. Internal institutions are controlled directly by public officials and leadership. This is a significant advantage in that financing processes are in direct synch with programmatic priorities throughout all agencies.

Internal financing institutions have the advantage of being directly connected to governmental leadership, which means they can be (though, are often not) integrated into policy and programmatic decision-making. This can be extremely important in the short-term as community leaders develop an initial response to resilience and climate impacts. Because of the direct control that public leaders have over internal institutions, it is much easier to create efficiencies in staffing and resource sharing, specifically through the use of internal service funds. By taking advantage of existing administrative and indirect resources within the government, internal institutions are able to maintain administrative costs, especially in the short-term. There are limitations to internal institutions, however. It can be very difficult for a single agency or programmatic unit to manage or control a variety of financing and funding programs. In addition, a strictly internal approach to

establishing internal institutional capacity could limit the community's capacity to create institutional scale, independence, and innovation, all of which will be essential in regard to mitigating the broader impacts of climate change.

External institutions. External financing institutions have the capacity to receive and manage any number of revenue sources supporting multiple infrastructure projects. External financing institutions are independent organizations and are responsible for staffing support and administration. There are exceptions; for example, it is not uncommon for executive directors of economic development authorities to be employees of the local governments in which they serve. Again, however, the primary responsibility for supporting administration and staffing rests with the organization. It deserves mention that the self-supporting nature of external authorities means that it must create administrative support through its own revenue streams and project investments. In short, the institution must have the revenue and capacity to support all expenses all the time. The primary benefit of an external institution is that it enables a self-supportive, independent process for financing resilience infrastructure.

As is the case with internal financing institutions, external institutions can take any number of forms, but two are most relevant here. The first is a publicly chartered ***financing authority***. Financing authorities have the capacity to make investment decisions outside the auspices of local government. This includes establishing procurement policies, hiring and firing staff, and prioritizing infrastructure project investments. However, government leaders often have significant governance control through the appointment of board members. Coupled with the fact that most, if not all, investment decisions must be ultimately approved by institutional boards, local governments are never completely divorced from institutional decisions. That said, external authorities do still have significant autonomy in regard to program and investment management. This creates an apolitical investment process. An important characteristic of many of the external institutions we have studied is that they are able to create significant intellectual financing capacity. In addition, and equally important, financing processes are completely outside the full faith and credit of the public sector. In other words, the financing is considered “off balance sheet”, which adds to the independence of the institution. Financing authorities are often structured in the form of independent nonprofit or 501(c)3 institutions. External financing authorities have the capability to manage multiple funding and financing programs across an array of issues, with the capacity to finance capital and infrastructure projects across jurisdictional boundaries, if necessary.

The primary drawback to external authorities is that they require sustained capacity to ensure staffing and long-term capacity. They cannot be “turned on and off” as financing needs within the government arise. This may make them infeasible in smaller communities like Bourne, MA in the short-term as the community works to move resilience projects and project funding to scale. Finally, the independent nature of these authorities requires them to be a step or two removed from policy and program development in areas that are not directly related to specified financing processes; therefore, there is less programmatic control on the part of county leaders.

The second primary form of external financing institutions are **Public-Private Partnerships (P3s)**. As local governments increasingly struggle to meet flooding and stormwater

requirements and needs, many are considering P3 structures to augment local capacity and reduce risk. A P3 is a “contractual arrangement between a public agency (federal, state or local) and a private sector entity. Through this agreement, the skills and assets of each sector (public and private) are shared in delivering a service or facility for the use of the general public.”¹¹ The two parties share resources in delivering the good or service, and they also share the potential risks and rewards. P3s can be used for various aspects of a project, including financing, design, construction, operations and maintenance, and/or monitoring and evaluation.

The application of P3s for environmental and resilience needs such as stormwater is a relatively new practice, but these structures have been used extensively in other utility and infrastructure contexts, including water, wastewater, transportation, and military housing. Public sector benefits vary from project to project, but some of the more universal benefits that are also transferrable to the stormwater sector include:

- *Lower costs:* One of the biggest benefits of P3s is their potential to reduce the overall cost of a project by finding efficiencies that may not be available to the public sector.
- *Expedited projects:* In many cases, P3s allow projects to get off the ground faster and to be completed sooner because of efficient project management and the ability to bypass some of the administrative slow-downs than can happen when a public agency is managing the project.
- *Improved asset management:* Asset management is a systematic method for evaluating the life-cycle costs of infrastructure assets. A private company tasked with not only construction responsibilities, but also ongoing maintenance, is more likely to be motivated to undertake strategic, long-term planning to maximize the life span of installed infrastructure.
- *Development of innovative strategies and technologies:* Because P3s include built-in incentives for achieving outcomes more cheaply or quickly, these arrangements can catalyze the development and implementation of newer and/or more effective technologies or mechanisms for achieving desired impact.

P3s offer the opportunity to harness many of the advantages offered by private sector engagement. Just as with publicly managed projects, stormwater managed by a private firm require local governments to establish a dedicated, reliable funding stream via one or more revenue sources such as taxes, fees, grants, and state revolving loan funds. Communities considering a P3 structure should first clearly understand their infrastructure financing requirements over the next 10-20 years and their capacity to meet these needs. This will inform whether a P3 is needed and how it should be structured. Knowing what fundamental gap(s) need filling – administration, permitting, construction, etc. – will better position a community to design a P3 program that meets that need.

Community Assessment Questions:

¹¹ The National Council for Public-Private Partnerships. “7 Keys to Success.” Accessed 7/20/14: <http://www.ncppp.org/ppp-basics/7-keys/>

- ***Has the community demonstrated a foundational level of institutional capacity necessary to develop and implement a comprehensive resilience financing process?*** The S&P Global Ratings Report makes it clear that the Town of Bourne has very strong existing institutional capacities associated with financing processes. The Town’s financing and budgeting processes are guided by clear rules, processes and procedures, which has resulted in prudent financial management to the point that the community actually runs budget surpluses in some years. This strong financial foundation will serve the community well moving forward.
- ***Has the community established dedicated resilience financing programs, agencies, and/or institutions?*** Though Bourne’s existing financing system is strong and stable, the anticipated impacts of climate change will require local leaders to expand the capacity of the current system over time. Specifically, the Town will need to expand its institutional capacity to match increasingly complex capital infrastructure needs and requirements. To be clear, institutional capacity represents both a short-term and long-term need in the community. Currently the Town of Bourne funds its stormwater programs directly through the general fund. Though this may have been appropriate previously, our assessment has indicated that revenues supporting stormwater management are not sufficient to support basic regulatory requirements, especially when coupled with the need to finance capital projects. Expanding necessary funding and investment will require an analogous expansion of institutional capacity.

REVENUE STREAMS AND CASH FLOW. Financing institutions ensure that revenues are invested efficiently and effectively; this of course means that revenues are paramount to the process. What makes establishing a revenue strategy to support resilience infrastructure is that estimating costs into the future is difficult. Ultimately the scale of revenues needed to support resilience activities will require a more thorough understanding of the anticipated impacts, assets at risk, and necessary mitigation activities.

While studies on the long-term costs and benefits of adaptation for infrastructure remain limited, it is expected that the impacts of climate change will result in a premium on infrastructure costs of between 10-20%.¹² Given that much of the responsibility for funding and maintaining non-defense infrastructure construction and maintenance is the responsibility of local governments,¹³ coastal communities like Bourne can expect to shoulder much of this anticipated increase in infrastructure financing responsibility. Therefore, it is reasonable to expect that Bourne will experience a cost premium on capital infrastructure of at least 10% into the future. Assuming the 2020 bond issuance as a guide, Bourne can expect increased infrastructure costs of at least \$500,000 per year into the future. To be clear, this number is a high-level estimate, which means by definition it will be wrong. In fact, the annual costs to Bourne could end up being significantly higher in the future. In short, there is no certainty in regard to these types of estimates. What is certain,

¹² <https://econadapt-toolbox.eu/infrastructure-costs-and-benefits-adaptation>

¹³ <https://www.cbpp.org/research/state-budget-and-tax/its-time-for-states-to-invest-in-infrastructure>

however, is that taking action now will enable the town to reduce its long-term resilience and adaptation infrastructure costs.

Community Assessment Questions:

- ***Does the community have codified and sustainable revenue streams in support of resilience infrastructure and financing?*** Bourne does not currently have revenue streams or financing systems dedicated specifically and/or solely to support resilience infrastructure. Generally, the town has avoided setting aside funding pools for broader issues (i.e., resilience), instead electing to fund specific projects related to broader issues out of the Town General Fund or through grants. The Town has found this practice to be straightforward, with project requests providing a clear understanding of the funds needed and how they will be used.

In terms of capital projects, the Town does have some potential streams of revenue that could be used for resilience. For example, Bourne has used revolving funds for coastal improvements and community preservation funds for cultural and historical assets. By tying resilience to other related issues, Bourne has—and could continue to—mobilize other funds to improve the resiliency of existing assets. However, this does not entirely answer how the town will address new resilience infrastructure.

POTENTIAL FINANCING MECHANISMS. In addition to new revenue streams, there is the potential for resilience financing institutions to utilize innovative financing and investment processes. While the use of these financing mechanism will ultimately be determined by how the Bourne resilience financing institution is structured, there are opportunities associated with three innovative processes: value capture; alternative bonds and debt financing tools; and, performance-based financing.

Value capture: Value capture is a type of public financing that recovers some or all of the value that public infrastructure generates for private landowners. The public sector is often responsible for the infrastructure required to support urban development. This infrastructure may include road infrastructure, parks, social, health and educational facilities, social housing, climate adaptation and mitigation tools, and more. Such infrastructure typically requires great financial investment and maintenance, and often the financing of such projects leans heavily on the government bodies themselves.

Public entities, tasked with creating and maintaining this infrastructure, are constantly in search of mechanisms which can allow for fiscal support of these investments. One such mechanism of financing is Value Capture. Value capture secures and recovers a portion of the benefits delivered by public investments, in order to offset the costs of the investment itself. Value Capture strategies operate under the assumption that public investment often results in increased valuation of private land and real estate. "Capturing" the subsequent increase in value, governments are able to recuperate funds, which can ultimately be used to generate additional value for communities in the future. Specific types of value capture financing mechanisms include:

- **Special assessment districts:** Special district governments are independent, special purpose governmental units, other than school district governments, that exist as separate entities with substantial administrative and fiscal independence from general

purpose local governments. Special district governments provide specific services that are not being supplied by existing general purpose governments. Most perform a single function, but in some instances, their enabling legislation allows them to provide several, usually related, types of services. The services provided by these districts range from such basic social needs as hospitals and fire protection, to the less conspicuous tasks of mosquito abatement and upkeep of cemeteries.

- **Tax increment financing (TIF):** TIF is a tool used by municipal governments to stimulate economic development in a targeted geographical area. TIFs are used to finance redevelopment projects or other investments using the anticipation of future tax revenue resulting from new development. When a TIF district is established, the “base” amount of property tax revenue is recorded using the status quo before improvements. To the extent such efforts are successful, property values rise, leading to an increase in actual property tax receipts above the base. While the base amount of property tax revenue (the level before redevelopment investments) continues to fund city services, the increase in tax revenue is used to pay bonds and reimburse investors and is often captured as city revenue and allocated toward other projects.
- **Joint development:** Joint development projects involve integrated development of public infrastructure improvements, with projects physically or functionally related to commercial, residential, or mixed-use development. Public and private investments are coordinated between agencies and developers to improve land owned by a public agency. The projects are designed to benefit both public and private entities as well as share costs among project partners.

Alternative bonds and debt financing tools. Debt financing is the key type of long-term borrowing that localities use to raise money for building and constructing long-lived infrastructure assets. About 90% of state and local capital spending is financed by debt, primarily through municipal bond markets. Though bond financing will likely remain a significant and popular financing resource, local leaders are beginning to adopt alternative financing mechanisms to address infrastructure needs, especially as they relate to mitigating the impacts of climate change. These alternative financing mechanisms provide local governments with cost effective and flexible ways to pay for infrastructure systems.¹⁴

- **Grant anticipation revenue vehicle bonds (GARVEEs):** In the broadest sense, a GARVEE is a type of anticipation vehicle, which are securities (debt instruments) issued when moneys are anticipated from a specific source to advance the upfront funding of a particular need. In the case of transportation finance the anticipation vehicles' revenue source is expected Federal-aid grants. Developed within the transportation industries, GARVEEs enable a government to accelerate construction timelines and spread the cost of an infrastructure project over its useful life rather than just the construction period.

¹⁴ *Infrastructure Financing: A Guide for Local Government Managers.* A Policy Issue White Paper Prepared on behalf of the ICMA Governmental Affairs and Policy Committee, January 2017. Can Chen, Florida International University, and John R. Bartle, University of Nebraska at Omaha. Page 15.

The use of GARVEEs expands access to capital markets as an alternative or in addition to potential general obligation or revenue bonding capabilities. The upfront monetization benefit of these techniques needs to be weighed against consuming a portion of future years' receivables to pay debt service. This approach is appropriate for large, long-lived, non-revenue generating assets.¹⁵ As the name implies, GARVEEs were established as a mechanism for accelerating transportation financing through the anticipation of federal loans. However, the concept can apply to other types of grant funding that are integral and essential to resilience infrastructure.

- **Green bonds:** Green bonds were created to fund projects that have positive environmental and/or climate benefits. The majority of the green bonds issued are green “use of proceeds” or asset-linked bonds. Proceeds from these bonds are earmarked for green projects but are backed by the issuer’s entire balance sheet. There have also been green “use of proceeds” revenue bonds, green project bonds and green securitized bonds.
- **Social impact bonds:** Social impact bonds are unique public-private partnerships that fund effective social services through performance-based contracts. Impact investors provide the capital to scale the work of high-quality service providers. Government repays those investors if and when the project achieves outcomes that generate public value.

Paying for performance and outcomes. Finally, performance-based financing focuses on achieving desired outcomes rather than the means for getting there. If infrastructure investments can be evaluated based on desired environmental, economic or social outcomes, investors would be able to target funds to projects that achieve those outcomes at the lowest cost. Paying for results rather than infrastructure projects provides incentive to private firms to find the most cost-effective and highest-performing technologies and practices.

Paying for performance represents a new way of doing business for many public revenue programs. Performance should supplement other funding criteria in order to ensure multiple project needs are addressed without sacrificing financial efficiency. One common concern about the cost effectiveness of restoration investments is that getting projects to the point of investment and implementation can require a variety of interventions that are not directly associated with them. Overcoming cultural barriers through education and outreach or providing technical assistance are often “off balance sheet” in that they do not show up in project proposals or cost assessments and therefore are not accounted for in the credit generation process. This need not be the case. The power of performance-based financing is that the funding organization can require the seller of credits, i.e., the project implementer, to be responsible for all project costs, including outreach, evaluation and monitoring, and long-term technical assistance. Including these activities in the marketplace provides incentive to ensure that they are accomplished efficiently.

These three alternative and innovative financing mechanisms are representative of broader financing innovations occurring at the local level; as the impacts of climate change and the need for resilient infrastructure grows over time, so too will the need to adapt

¹⁵ Ibid

financing systems and processes. While Bourne is well positioned to adjust to these inevitable changes, doing so will require a financing system that is adaptable and innovative. The final component of that system—procurement policies—is where the entire system comes to fruition.

EFFICIENT PROCUREMENT PROJECT DELIVERY. One of the most significant benefits and opportunities associated with establishing a dedicated financing system and institution—either internal or external—is associated with an often-overlooked component of the financing process: effective procurement processes. Government procurement—government agencies soliciting the business or private sector for the goods and services they provide—represents the point where public revenues and regulations directly connect to the market and private investment. Procurement is where the entire financing system is enabled. All the innovative policies and programs designed to reduce costs, incentivize innovation, and accelerate implementation are able to function well, or not, through the procurement system.

RECOMMENDED NEXT STEPS:

Based on the assessment conducted by the SNEP Network project team, the following is recommended for implementation by Bourne within the near term:

- *Draft and implement a strategic plan associated with the creation of a new resilience financing institution or enterprise program.* Our foundational recommendation is to create a new, dedicated resilience financing institution. In addition, the project team believes that an internal structure, most likely in the form of a resilience enterprise fund, is the most prudent approach at this time. The business plan should address all pertinent governance, management/leadership, funding, and investment processes. Specific focus should be given to the following:
 - Directly connecting resilience planning and project prioritization to the financing institution’s capital investments. The most important first step is to ensure that the financing process is advancing the community’s resilience plans and priorities. Specifically, the strategic plan should clearly identify the types of projects that the financing institution will support. Our assessment indicates three short- to mid-term priorities: stormwater management; flood control and abatement; and, ecosystem restoration and protection.
 - Identifying an appropriate corporate structure. Prioritizing the types of capital projects that will be the focus of the financing institutions activities creates the framework for identifying and leveraging revenue streams. To be clear, the primary assumption should be that the primary revenue flows should come from sources outside of the general fund. In fact, if the community chooses to focus its financing and funding efforts on general fund revenues, then the only appropriate institutional structure will be a new agency or program (keeping in mind that that new agency will compete with existing agencies for resources. This will require either reallocating general funds or raising general fund revenues, most likely in the form of property taxes). Our project team is convinced that the most appropriate corporate structure at this time is an *enhanced* resilience enterprise fund or program.

- Identifying the most sufficient, stable, and equitable revenue streams. By definition, enterprise funds are based on fee-for-service funding. In other words, the fund will provide stormwater management, flood abatement, and ecosystem restoration services to the community, and fees will be assessed on the residents and businesses of the Town in return for those services. Though these fees will be foundational to the enterprise fund, they should not be exclusive. In other words, the resilience fund should have the capacity to receive (though not assess) multiple forms of revenues at the discretion of Bourne elected officials. Additional funds and revenues may be in the form of value added taxes (TIF, special tax districts, etc.), state and federal grants, and perhaps philanthropic investment.

Our recommendation is that Bourne commit to a modest annual investment, perhaps in the range of \$100,000, and then increase those investments in small increments over a long period of time. This will enable the community to establish clear revenue and investment criteria that are broadly supported by the residents and business with the Bourne community. In turn, this iterative process will enable Town leaders to maintain the confidence in its budgeting and financing processes.

- Codify procurement policies and processes including the selection of competition, contract type, and payment structure. Community leaders should implement a more thorough assessment of its existing procurement policies and identify opportunities for the resilience fund to expand on those capacities. Specific attention should be given to identifying opportunities to reduce contract risk, and incentivize innovation and ingenuity associated with resilience project development and delivery.

CONCLUSION. The Town of Bourne has the opportunity to be a leader on climate resilience planning and financing, not only on Cape Cod but also within Massachusetts. By prioritizing investments and dedicating revenue through a financing system that incorporates climate resilience, flooding, and stormwater, Bourne will be well positioned to attract both private and philanthropic capital, maintain their bond rating, and leverage additional funding from state, federal. Should Bourne continue to be proactive in their approach to climate resilience planning and finance, the SNEP Network envisions future opportunities of additional technical assistance to support implementation of their financing initiatives.



This report was produced by the dedicated team at [Throwe Environmental, LLC](#) in the company's role as a core partner within the SNEP Network. Throwe Environmental is committed to developing climate resilience, environmental finance, and policy and governance solutions for its public, private, and nonprofit clients. As a SNEP Network partner organization, Throwe Environmental focuses on financing, training, and leadership development. Throwe Environmental is based in Bristol, RI and helps communities nationwide address their climate challenges.