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North Carolina's Bold Water and Wastewater Infrastructure Plan

NORTH CAROLINA'S MASTER PLAN ADDRESSES ORGANIZATIONAL AND FINANCIAL MANAGEMENT CHALLENGES FOR THE LONG-TERM VIABILITY OF ITS SMALL WATER AND WASTEWATER SYSTEMS.

With 10.3 million people, North Carolina is the ninth most populous US state; however, for its size, it has a relatively large percentage of independent local government drinking water and wastewater systems, including incorporated municipalities, counties, and water and sewer authorities.

There are nearly 550 water systems owned by units of local government operating in the state; of these, more than 200 have 2,000 or fewer water connections. Nearly 300 publicly owned sewer systems and treatment plants collect, treat, and discharge more than 1.4 bil gal of wastewater per day. Of these, 150 plants account for only 4% of the total wastewater treated.

The state's small drinking water and wastewater utilities once had robust customer bases and generated significant enterprise fund revenue from textiles, furniture, tobacco, and small manufacturing businesses. However, over the past 20 years, the economy of North Carolina has changed, and the state has lost many of its large industrial water-use customers. Many water and wastewater systems were started by industries but then given to the towns that grew around them. When an industry closes and there is no longer a large water or wastewater user, local government revenues decrease, and often the towns do not have adequate funds to cover utility operations,

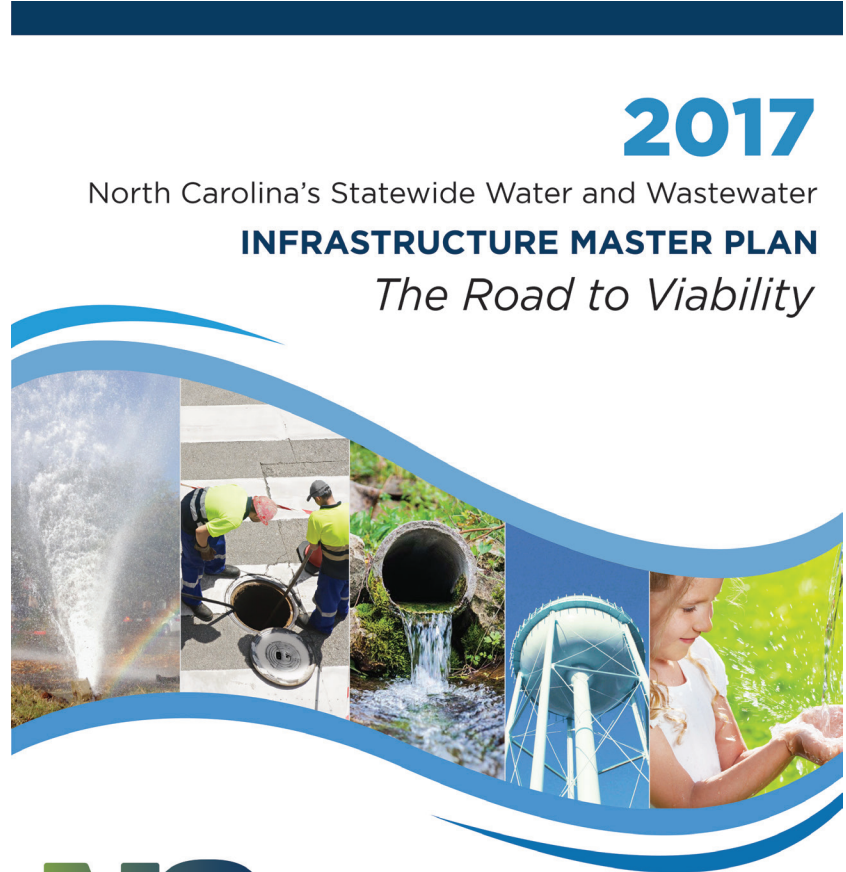
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maintenance, and infrastructure repairs. As a result, there are now dozens of very small systems in the state with declining customer bases; when this decrease is combined with general declines in water consumption, water and sewer rate increases become unfeasible and revenue is ultimately insufficient to cover the full cost of service. Affordability issues have magnified as job growth now occurs, primarily in metropolitan areas, and older customers on fixed incomes assume a higher percentage of rural utility customers across the state.

The North Carolina General Assembly has seen increases in requests for grant funds to address aging and failing infrastructure from these utilities, and some requests for aid were repeated every few years. In response, the General Assembly created the North Carolina State Water Infrastructure Authority (Authority), part of whose mission is to address questions concerning repeated grant assistance for enterprise systems. Specifically, the Authority wanted to move toward funding long-term solutions as opposed to “Band-Aid” approaches.

NORTH CAROLINA'S NEEDS

In North Carolina and elsewhere across the country, state and local governments are struggling to meet required investment levels and maintain levels of service that protect public health, safety, and welfare. When the Authority investigated the state's drinking water and wastewater infrastructure needs, it found that issues beyond just the cost of water infrastructure needed to be addressed. Over the next 20 years, capital cost estimates for North Carolina's drinking water and wastewater system needs range from \$17 billion to \$26 billion, and it seems more likely the final bill will land at the higher end of this range. The needs in these estimates do not include population growth spikes, improvements for



Water Infrastructure
ENVIRONMENTAL QUALITY

2017

North Carolina's Statewide Water and Wastewater INFRASTRUCTURE MASTER PLAN

The Road to Viability

system resilience, or mitigation of recent hurricane-related flood damage that occurred in 2016 and 2018.

One of the Authority's key tasks was to define and address the state's drinking water and wastewater infrastructure needs through a first-of-its-kind Statewide Water Infrastructure Master Plan. The Authority immediately recognized that the Master Plan needed to address issues beyond just the cost of water infrastructure. A holistic look at the challenges facing public water and wastewater utilities revealed that the state must also help utilities address the organizational and financial management challenges that may contribute to their physical infrastructure limitations.

STATEWIDE WATER AND WASTEWATER INFRASTRUCTURE MASTER PLAN

The Master Plan presents North Carolina's road map for viable systems and applies to owners and operators of water and wastewater utilities and systems that serve the public. The Authority determined that North Carolina will best be able to meet its water infrastructure needs by ensuring utilities are, or are on a path to being, viable systems.

A viable system is one that functions as a long-term, self-sufficient business enterprise; establishes organizational excellence; and provides appropriate levels of infrastructure maintenance, operation, and reinvestment that allow the utility to

provide reliable water services now and in the future. Viable water and wastewater systems safeguard public health, protect the environment, support vibrant communities, and encourage economic development.

The state's role is to foster the long-term viability of individual water and wastewater utilities. In addition, local elected officials, town and county managers, utility governing boards, customers, stakeholders, and the public all have important roles in achieving viable utilities.

The Master Plan (Figure 1) integrates three key focus areas that utilities must address to be viable:

- Infrastructure management
- Organizational management
- Financial management

Infrastructure management. Most utility-needs surveys and planning documents emphasize physical infrastructure only—the size of treatment plants, miles of pipeline, and other components needed to operate water and wastewater systems. Some include the possibility that changing regulations may require upgrades in treatment, collection system, and

distribution system infrastructure. Most loan and grant applications are made to address these physical needs. However, managing infrastructure goes beyond solving just today's problems; it involves long-term master planning that addresses

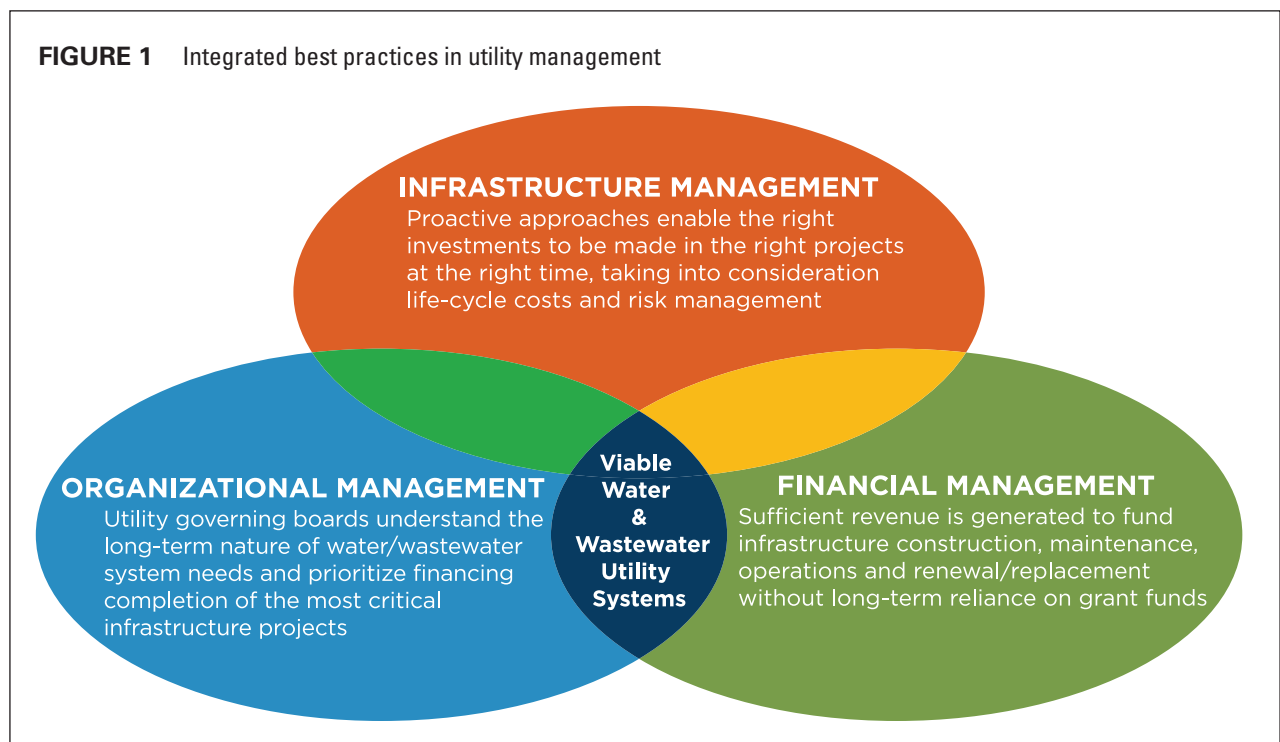
- the risks of failure of key water infrastructure components;
- proactive approaches to construct, operate, maintain, and renew/replace infrastructure that will minimize long-term costs; and
- financial analysis that ensures wise and timely use of investments.

Organizational management. Utility organization often comprises governing boards, utility management, operations and maintenance staff, customers, and stakeholders. Organizational management involves engaging all of these levels to understand the long-term nature of water and wastewater infrastructure needs, implement a plan to address and finance the needs in a prioritized manner, and foster customer support.

Utility governing boards make critical decisions about allocating funds to operate, renew, and replace critical water and wastewater systems. However, funding for long-term needs is often deferred because water and sewer infrastructure is “out of sight, out of mind.” Without a long-term plan to meet those needs, the default approach of “fix it when it breaks” results in less reliable infrastructure and higher public costs.

Financial management. Building financial stability for the future requires equal emphasis on long-term planning, financing, and implementation. Delaying infrastructure investments can result in utility service degradation, increased public health and environmental risks, larger expenditures for emergency repairs, and missed opportunities for economic development. Local economic conditions, declining population, and declining use per connection contribute to loss of revenue, while the cost of providing water and sewer services is increasing. Furthermore, rate and fee increases are rarely popular, especially when they

FIGURE 1 Integrated best practices in utility management



do not visibly improve customer service or capacity.

THE ROAD TO VIABILITY

Achieving water utility viability across North Carolina requires actions by state and local governments as well as water utility providers (Figure 2) in the following ways:

- Creating strong resource partnerships among state and federal agencies, key organizations, and utility providers for more cohesive support as they work to reach and maintain viability by leveraging existing resources and programs
- Providing resources and tools that support proactive utility management, including new state grant programs
- Prioritizing funding for projects that are directly linked to utility viability and represent best practices for utility management

GRANT PROGRAMS TO FOSTER VIABILITY

The Authority established two new state grant programs to help

utilities in North Carolina: asset inventory and assessment (AIA) grants and merger/regionalization feasibility (MRF) grants.

AIA grants. AIA grants are provided to small and medium-sized

- How will the proposed AIA project help address these challenges?
- How will the utility use the information developed through the AIA project to demonstrate

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utilities to help them create inventories of their water or wastewater system assets and document their physical condition. The Authority prioritizes applications that support long-term infrastructure management, and to this end, it includes the following questions:

- What are the top three challenges the system expects to face in the next five years?

the need for future infrastructure projects, and how will these projects be prioritized for completion?

- How will the asset inventory developed through the AIA project be kept up-to-date, and how will the utility pay for this ongoing effort?
- Interest in the AIA grant program far exceeded initial expectations, and

FIGURE 2 Areas of collaboration between utilities and state and local governments

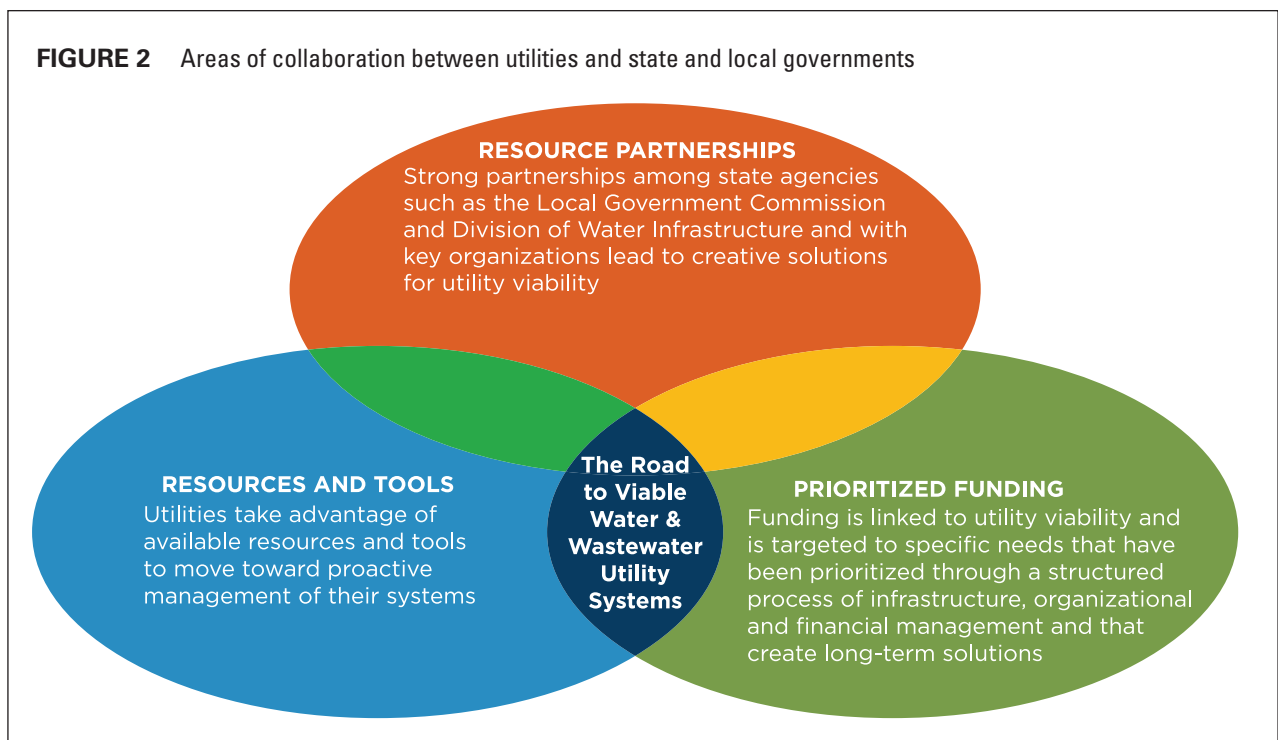
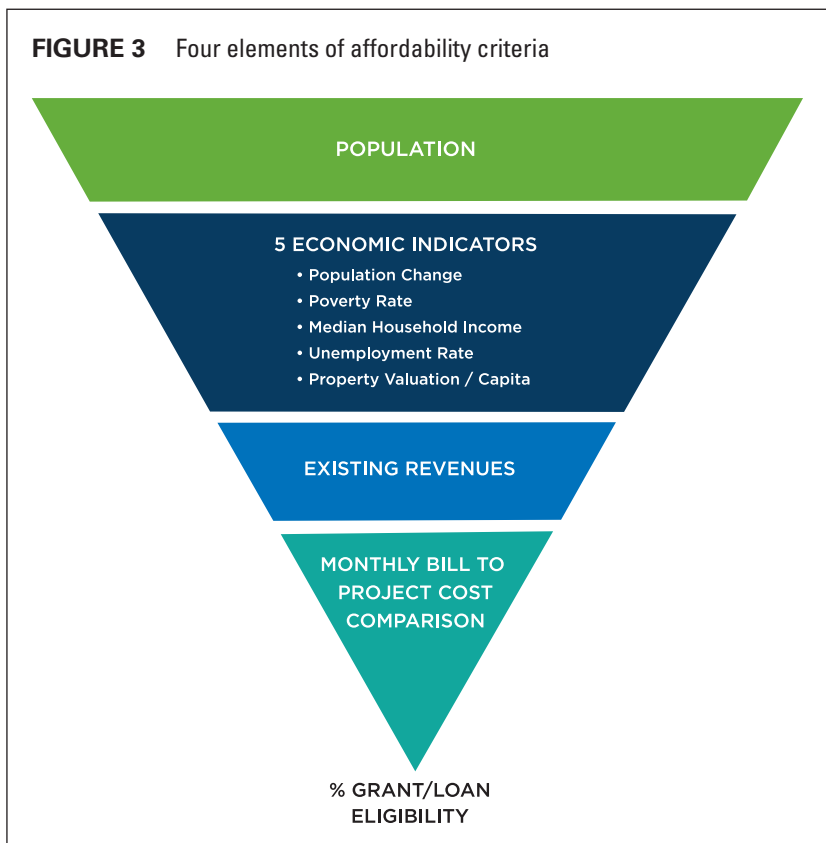


FIGURE 3 Four elements of affordability criteria



the Authority awarded 107 of the 378 grant requests received for a total of \$13.4 million.

MRF grants. The Authority has found that some utilities struggle with self-sufficiency and that an alternative path to viability might help with their long-term sustainability. MRF grants help utilities define and evaluate potential options for partnering with one or more utilities. MRF grants enable utilities to examine issues objectively and comprehensively to determine whether a merger, regionalization, or partnership can increase the viability of one or more partners without negatively affecting the potential partners. In addition, a full range of partnership solutions can be examined, including shared management opportunities, contract operations, public-private partnerships, privatization, inter-local agreements, and other activities or arrangements.

Applicants for MRF grants must also address questions such as the following:

- Has the feasibility of a merger/regionalization/partnership been studied before? What have been the barriers to either conducting such a study or implementing the recommendations from a previous study? If a study was previously done, how will this study differ?
- What are the current challenges facing the system and potential partners, and how might merging/regionalizing/partnering help resolve them?

The Authority anticipated receiving only a few MRF grant applications, but it has awarded grants to 13 applicants for a total of \$640,000.

WATER AND SEWER SERVICE AFFORDABILITY CRITERIA

Recognizing that some of the smallest rural utilities in the state have some of the highest water and sewer rates, the General Assembly also tasked the Authority with recommending ways to most efficiently

use current funding resources, including the very limited amount of grant funds. The Authority evaluated potential approaches and structured criteria such that only utilities with the highest rates are eligible to receive a grant for the entire cost of a project. Because low- to moderate-income households exist in almost every community in North Carolina, these high utility rates are considered independent of median household income. The criteria are used to focus grant funding toward rural, economically distressed areas of the state and, within that focus area, to distinguish between entities that can least afford a critical project and those that can afford to incur some amount of debt or obligate some amount of funding toward potential solutions.

The affordability criteria recognize not only the economic situation of a community but also its efforts to manage itself as a financially viable enterprise. The elements of affordability criteria, shown in Figure 3, prioritize those water and wastewater service providers and local governments that meet the following criteria:

- They have smaller populations as determined by the number of residential connections.
- They are comparatively worse than the state benchmarks for five key economic indicators: population change, poverty rate, median household income, unemployment rate, and property valuation per capita.
- They have current monthly utility bills that are higher than the state median (see Figure 4).
- They will demonstrate a project cost per connection that is higher than the state median.

This restructured approach stretches state funding resources to benefit more communities by combining loans and grants on the basis of affordability while acknowledging that full grant funding of projects is, in some cases, still the most appropriate approach

when monthly bills are among the highest in the state.

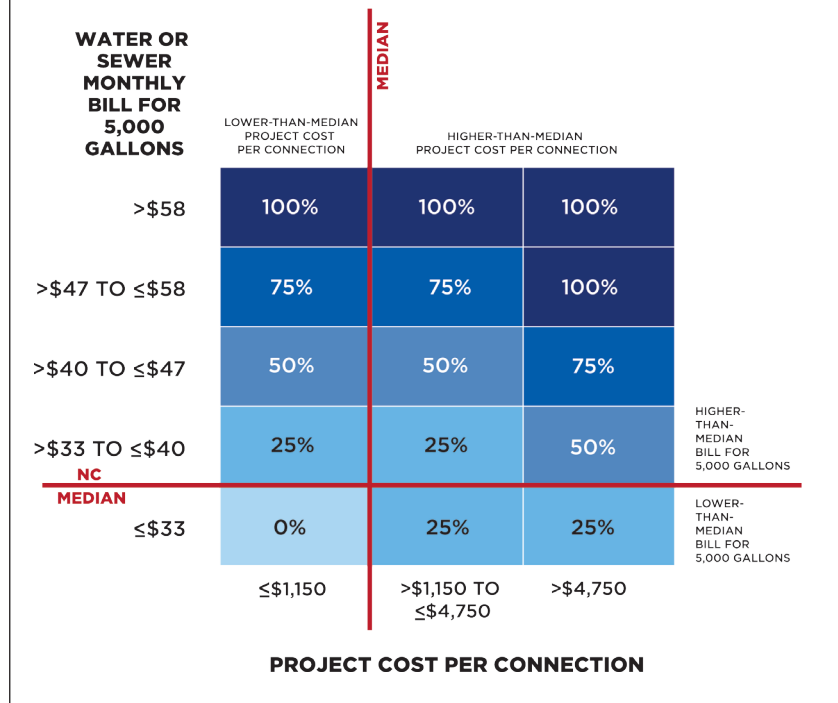
The affordability criteria determine not only grant eligibility but also the percentage of grant funding that may be awarded. The combination of monthly bills for 5,000 gal of water or wastewater usage and the project cost per connection reflects a utility's capacity for financing a proposed project along with past expenditures (Figure 4). A matrix that combines these two metrics is then used to determine the mix of grant and loan funding that may be offered.

LONG-TERM PLANNING

The Authority has created new approaches to address difficult questions centered on the long-term viability of struggling water and wastewater utilities across the state. Key to the new approach is recognition that focus is needed on issues beyond simply the present cost of water infrastructure. Particularly at smaller systems, organizational and financial management challenges that contribute to physical infrastructure limitations must be addressed comprehensively.

North Carolina's Statewide Water and Wastewater Infrastructure Master Plan has been nationally recognized by organizations including the US Environmental Protection Agency, the National Academy of Public Administration, and the US Water Alliance for its leadership and creativity in approaching the combined challenges of infrastructure and organizational and financial management. This plan serves as a cornerstone document to bring awareness of utility challenges to local governing boards, utility managers, and customers; it also presents opportunities and resources to address the challenges. In addition, the Master Plan serves as the basis for funding program changes, funding priorities, and recommendations for future initiatives that advance utility viability. As a result, North Carolina can better meet its water

FIGURE 4 Water or sewer monthly bill for 5,000 gal



infrastructure needs by ensuring utilities are, or are on a path to be, viable systems.

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