NC STATE UNIVERSITY

Growing Pains: Water Infrastructure in North Carolina

Dr. Martin W. Doyle, UNC-Chapel Hill

Needs

By one recent estimate, North Carolina needs to invest $16.6 billion between 2005 and 2030 to repair and expand its water, sewer and storm water infrastructure (*Water2030*). Driving this need is a combination of factors including increased demand due to population growth, uncertainties over water supplies, higher construction costs, a need to replace aging infrastructure and compliance with federal regulations. These needs are split about evenly between urban and rural areas. In general, rural areas are the least able to afford these costs, struggling with high fixed costs of delivery, small populations, economic changes that have caused the departure of traditionally large users, and a stagnant tax base.

Vision

The governing vision is that every North Carolina citizen has a basic right to safe drinking water and adequate disposal of waste. Water and wastewater services are very decentralized in North Carolina, as in all states; as in most eastern states, there are no water czars. The state provides minimum oversight for regulatory compliance (water quality), and also serves as an (newly) important source of grants and loans to local providers. The federal government stepped back from its traditional role as a primary funder for water projects, forcing the state and localities to pick up this burden.

In response to the 2007 drought, Governor Easley proposed an increased role for the state in managing water resources (e.g., tying state funding to planning; mandating and managing water transfers in extreme times of drought). Several municipalities that wish to maintain autonomy over their water resources have resisted this move.

Distribution of Authority

As a result of this decentralized model, there are some 500 government-owned utilities or large non-profit corporations water systems in the state (and thousands of smaller systems) and over 400 sewer systems, most municipally owned and operated. Municipally operated systems deliver water to about two-thirds of North Carolinians and provide sewer service to about half the population. While all water in the state belongs to North Carolina, the US Army Corp of Engineers manages several major dams for flood control purposes. They also distribute the allocation of water from those dams for drinking and for water quality purposes, based on agreements among the relevant stakeholders and within limits imposed by federal regulation.

Rate setting authority for government owned utilities sits with local governing boards. The US Environmental Protection Agency (EPA) identified “full cost pricing” as a core principle for sustainable infrastructure; that is, pricing that recovers the costs of building, operating, and maintaining a system as well as reflecting the full costs of treatment and delivery. This is a suggestion and not always observed.

In the past, funding for water and sewer infrastructure came from a mixture of public and private financing – both loans and grants. With the passage of the Federal Water Pollution Control Act of 1972, federal grants for water and wastewater infrastructure ramped up into a major public spending

program, second in scale only to federal highway spending. But starting in the 1980s, this federal grant money began to shrink. Since 1990, federal support has diminished considerably while shifting from grants to loans. Private lending has now supplanted federal monies as a primary source for loans. Private lenders loan primarily to municipalities considered credit-worthy, a group generally limited to medium and large municipalities with high credit ratings. This shift in funding has hurt rural North Carolina in particular, as some 60% of NC's (smaller) systems fail to qualify for most private infrastructure loan programs.

These systems must rely increasingly on grants or loans from the state, on a patchwork of smaller federal loan and grant sources, and on their own rate base. The majority of state grant financing over the past decade has come from the 1998 Clean Water Bond ($800 million), which is now depleted but still being paid off. The state lacks a dedicated source of revenue for such funding, relying to date on periodic bond offerings. Other states leverage real estate transfer taxes for water infrastructure.

The federal government adds to the cost of providing these services through periodic regulatory changes affecting water, sewer and storm water systems. These costs, particularly for wastewater treatment, can be substantial for smaller systems struggling to maintain what they already operate. It is no surprise that many of the systems under government restrictions for non-compliance are located in rural counties.

Performance and Efficiency

There are clear economies of scale for water/sewer infrastructure. As a result, customers in many smaller systems are burdened with rates that can reach twice what urban customers pay (and often exceed the 1.5% standard). Future (non-grant) investments will only add to the disparity. Many utilities set water rates at levels that do not cover their financial needs, that is, they do not practice full cost pricing. In reality, however, full cost pricing remains difficult to define, measure, and enforce. At the level of a specific utility, it is hard to evaluate the performance and efficiency, particularly because of the mixing of grants and loans. Larger systems, which must leverage loans for their infrastructure needs, are more likely to have a clearer picture of whether they are charging the real price of water service provision.

To drive down costs and encourage back-up sources of water in times of drought, the state has encouraged regionalization, a process to interconnect disparate systems and reduce the number of providers. While interconnectedness has grown significantly, particularly in the eastern part of the state, small systems still dominate statewide. Many small systems still resist chances to merge into larger systems, and many larger systems do not see an incentive to take on the liabilities of small systems that have deferred maintenance, repair and new investment.

Water loss is another issue contributing to higher costs. One estimate suggests that 11% of all treated water is lost to leaks, non-metered connections or other factors. This represents the entire usage of the Charlotte-Mecklenberg system each year.

Various systems around the state have been strained by economic shifts in the local economy. The shuttering of textile, furniture and other manufacturing facilities in smaller towns has removed important users (and revenue sources) from local systems. As a result, these systems struggle to pay

for existing capacity. In contrast, growing areas of the economy, for instance the pharmaceutical, resin, and biotechnology industries, are creating new and large users and making claims on growing municipalities that must grapple with bringing new capacity online, at times in the teeth of drought. Further, new stormwater regulations will create major capital investment and public administration challenges for many urban areas. The new regulations require a degree of post-construction operation and maintenance oversight that few North Carolina local governments are used to providing for environmental services.

Costs and tradeoffs

In the context of the current drought, utility rate structures have come under scrutiny. A range of rate setting practices is the result of local control. Most systems have a fixed and variable component to monthly bills, with the variable component reducing prices for greater consumption. Governor Easley and others recently called for a tiered structure that raises prices along with consumption to encourage conservation. The effectiveness of this approach will depend heavily on such variables as the quantity of water subject to the tiered rate and the prices and distance between tiers.

More generally, it is difficult to balance the needs of a utility and conservation because water consumers are very diverse. For instance, more than one-fifth of NC utilities receive a quarter of their revenues from their five largest customers. Thus, changes in rates that affect these customers, or changes in water consumption by these users will have a disproportionately large effect on the revenues of the entire utility. How water policies affect these largest consumers in small to mid-sized utilities must be carefully considered when attempting a broad-scale policy change (e.g., state mandated rate structure changes).

Thus, while it is tempting to suggest a blanket policy, each utility has a unique set of water users, and likely has a particular rate structure that will work for its needs in terms of revenues and services.

A barrier for funding specific communities, or in changing funding abilities, is that the objective of the funding program controls what type of community those funds can serve and what purpose the funds can be used for. For example, the EPA funds projects to increase compliance with the Clean Water Act, and thus is for wastewater treatment instead of drinking water. The US Department of Agriculture funds projects for rural development that take the form of helping rural communities with water extensions. For low-income communities, the NC Division of Community Assistance is the purist form of funding. Leveraging off of these types of funds necessitates a range of considerations for how to finance a state as diverse as North Carolina.

By nature, small communities do not have easy entry to bond market for loans. These smaller governments tend to get pure grants rather than loans from the state. In contrast to this approach, the state could use state bond funds for low or no interest loans (via a pooling mechanism) for small communities. That is, provide a range of loan mechanisms rather than either a loan or a grant to small communities. As an alternative to the current completely decentralized approach in North Carolina, West Virginia has the Infrastructure and Jobs Development Council. This council has the somewhat innovative role of coordinating loans and grants in the state and designing packages that leverage a mixture of funding mechanisms; that is negotiating a mixture of federal loans, state low-interest loans, and occasionally state grants for water infrastructure. Such centralized approaches and planning should be viewed cautiously because of the diversity of water providers and users.

However, there are economies of scale, particularly in terms of technical expertise, that may need to be considered for financing within the state.

References

Water2030, NC Rural Economic Development Center, 2006. Available at http://www.ncruralcenter.org/water2030/index.html

Case Study: Salisbury, North Carolina

Salisbury/Rowan Utilities (SRU), a consolidated water and wastewater system, serves customers in both the city of Salisbury and the surrounding county. With approximately 43,000 customers and one hundred employees, this system is classified as large by North Carolina standards. A pressure to keep rates low has traditionally governed the operation of the system.

SRU customers enjoy a number of advantages including a location adjacent to a sizable river with a large drainage area (making the area more drought resistant in comparison to areas located in headwaters) and a consolidated water and wastewater provision between city and county that achieves economies of scale, lowering prices.

Despite these advantages, the system is under considerable strain. Budget expenditures are skewed towards system expansion because of increased residential development in the city. At the same time, this expansion has come at the expense of capital investment. Estimates suggest that the system needs to invest $8 million per year while current capital investment in water/wastewater infrastructure is only $500,000 to $1 million. In some recent years, no money was allocated for capital investment.

SRU's budget has been seriously eroded by the departure of several large customers over the years. Up until the early 1990s, Salisbury was home to several large textile mills, which were heavy water users. However, between 1996-1999, SRU lost eight of its top ten water users, with one mill representing 20% of SRU's annual revenues. These closures blew big holes in SRU's budget since its fixed costs did not change as revenues plummeted. As a result, residential users were forced to pay higher rates to make up the difference. Large, industrial water users are not expected again and future water demands are projected to come from residential users.