



## **REPORT 6**

# Options for Assessing Water and Wastewater Infrastructure Needs in North Carolina

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Report to the North Carolina State Water Infrastructure Authority and  
the North Carolina Department of Environmental Quality Division of  
Water Infrastructure

This report is a product of the Environmental Finance Center at the University of North Carolina, Chapel Hill School of Government. Findings, interpretations, and conclusions included in this report are those of the authors and do not necessarily reflect the views of the NC Department of Environmental Quality, the University of North Carolina, or the UNC School of Government.

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## Executive Summary

The State of North Carolina has several options for the development of a comprehensive statewide assessment of water and wastewater infrastructure needs. Based on a review of the national EPA needs surveys, other existing data sources, alternative quantitative assessment methods, and active programs in other states, the EFC has identified the following broad options for North Carolina, recognizing that each option could be further adjusted to provide variations:

1. Use the EPA needs surveys as-is.
2. Modify the EPA needs surveys' estimates by using utilities' CIPs.
3. Redesign the CWNS to use statistical sampling (for NC's internal use).
4. Use LGC-collected financial data as a surrogate for capital needs and spending.
5. Expand Local Water Supply Plans or the Sanitary Surveys.
6. Conduct a separate statewide needs survey.
7. Establish a database of infrastructure needs based on data collected from funding applicants.
8. Establish a statewide database of capital needs for utilities.
9. Develop a statewide GIS portal and infrastructure database.

Options that involve the development of new surveys, needs databases, and/or geographic data are more expensive to pursue, but could significantly improve the accuracy, precision, and/or completeness of needs estimates over time. Such options also present opportunities to advance initiatives related to SWIA's overarching goal of enabling water and wastewater system viability. For example, the data collection, program structure, and data use aspects of the assessment process could be designed to help foster a strong capital planning and asset management culture at the local level, provide a vehicle for improved funding and regional coordination, and/or increase utility access to capital.

More complex policies, however, may involve significant trade-offs at both the State and utility levels. These trade-offs include increased administrative burdens, financial costs, and the potential for diminishing marginal returns at higher degrees of program complexity. The State of Ohio, for example, recently ended several aspects of its longstanding assessment program after determining that the benefits did not exceed the costs of the program.

Each assessment option for NC is discussed in more detail in the body of this report. The final section outlines various implementation strategies along with their associated challenges and opportunities. The summary table below is intended to facilitate high-level comparison between the options presented for both assessment and implementation.

Option	Data Collection	Program Structure	Data Use	Comprehensiveness <sup>†</sup>
1) Use EPA Needs Surveys	Already Required	No Change Required	Every 4 Years. E-clearinghouse for many wastewater projects.	Low Precision, Accuracy, and Completeness
2) Extrapolate from EPA Needs Surveys	Some Additional Requirements (need more CIPs and documentation)	No Change Required. Requires low additional State resources.	Every 4 Years. E-clearinghouse for many wastewater projects.	Low Precision, Moderate Accuracy, and Low Completeness
3) Redesign CWNS (for NC internal use)	Some or No Additional Requirements (may need more CIPs and documentation)	No Change Required. Same or less than current State resources required.	Every 4 Years. Almost no non-assessment options.	Low Precision, Moderate Accuracy, and Low Completeness
4) Use financial data from LGC	Already Required	No Change Required. Requires low additional State resources (or more to include non-governmental utilities).	Annual. Access and availability of financial data but none on needs or project data.	Moderate Precision, Low Accuracy, and Low Completeness
5) Expand Local Water Supply Plans or Sanitary Surveys	Some Additional Requirements (more questions and requests for documents)	No Change Required. Requires high additional State resources and coordination.	1-3 Yearly. Project review, regionalization, e-clearinghouse.	Moderate Precision, Accuracy, and Completeness
6) Separate Statewide Survey	Significant Additional Requirements	New Structure. Centralized, Strong Regional, or Weak Regional	Recurring or Ad Hoc. Access and availability of data, potential e-clearinghouse.	High Precision and Accuracy, Moderate Completeness
7) Funding Applicant-Only Database	Some Additional Requirements (request additional project lists)	No Change Required. Requires high additional State resources and coordination.	Recurring or Ad Hoc. Project review, regionalization, partial e-clearinghouse and access.	High Precision and Accuracy, Low Completeness
8) Comprehensive Statewide Database	Significant Additional Requirements	New Structure. Centralized, Strong Regional, or Weak Regional.	Recurring or Ad Hoc. Project review, regionalization, full e-clearinghouse and access.	High Precision, Accuracy, and Completeness
9) Statewide GIS Database	Most Significant Additional Requirements (same as above + location data)	New Structure. Centralized or Strong Regional.	Recurring or Ad Hoc. Project review, regionalization, full e-clearinghouse and access.	High Precision, Accuracy, and Completeness

Darker shades of red indicate relatively greater complexity/costs and/or relatively lower benefits than other options.

<sup>†</sup> Accuracy = how close the needs estimate will be to systems' true needs. Precision = how narrow the range of needs estimates will be. Completeness = how much of all systems' needs will be captured in the data.

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## Acronyms

<b>AWMC</b>	Area Water Management Council (Kentucky)
<b>CIP</b>	Capital Improvement Plan
<b>COG</b>	Council of Governments
<b>CWNS</b>	Clean Watersheds Needs Survey
<b>CWSRF</b>	Clean Water State Revolving Fund
<b>DWI</b>	Division of Water Infrastructure, North Carolina Department of Environmental Quality
<b>DWINSA</b>	Drinking Water Infrastructure Needs Survey & Assessment
<b>DWSRF</b>	Drinking Water State Revolving Fund
<b>EFC</b>	The Environmental Finance Center at the University of North Carolina, Chapel Hill
<b>EPA</b>	Environmental Protection Agency
<b>GIS</b>	Geographic Information System
<b>LGC</b>	Local Government Commission, North Carolina Department of State Treasurer
<b>NC DEQ</b>	North Carolina Department of Environmental Quality
<b>SWIA</b>	State Water Infrastructure Authority

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## Introduction

The North Carolina Department of Environmental Quality (NC DEQ) currently collects statewide water and wastewater infrastructure needs data every four years for the U.S. Environmental Protection Agency (EPA) as part of the Drinking Water Infrastructure Needs Survey and Assessment (DWINSA) and the Clean Watersheds Needs Survey (CWNS). However, the EPA needs surveys are designed specifically to enable the federal government to compare needs across states and to allocate DWSRF funds nationally. The EPA needs surveys do not provide a *comprehensive* assessment of all drinking water and wastewater infrastructure needs at the state level for reasons that are highlighted in Report 1. To grasp the full extent of infrastructure needs in the state – to assist in the development of the master plan and strategies to address infrastructure funding gaps – alternative methods and processes may be implemented.

The State of North Carolina has an opportunity to use, replace, modify, and/or supplement the national needs surveys in order to develop a comprehensive assessment of water and wastewater infrastructure needs for statewide planning purposes. Some options may also help foster a stronger culture of asset management and capital planning at the local level.

The first section of this report outlines several options for the achievement of this goal. The second section provides commentary on factors that might affect implementation in three related focus areas: (1) Data Collection; (2) Program Structure; and, (3) Data Use. The final section summarizes each option in a table intended to facilitate comparison among several related criteria, including the accuracy, precision, and completeness or comprehensiveness of the needs assessment options. The intent is not to present any single option as more preferable than others, but rather to provide high-level guidance on the opportunities and challenges associated with each.

## Options for the State of North Carolina

The State of North Carolina has at least nine broad options for assessing water and wastewater infrastructure needs for statewide planning purposes. These options have been developed after reviewing existing data sources, exploring modifications to existing surveys, and by investigating methods used by other states in cataloguing and assessing infrastructure needs. Supplemental reports delve into some of these options in more detail.

The options listed below vary in terms of comprehensiveness, associated costs, and implementation requirements. Some of the options may be adjusted or modified slightly to produce even more alternatives. Some may be combined to produce hybrid approaches, and others may be used as a stop-gap to smooth the transition to a more comprehensive long-term approach.

- 1. Use the EPA needs surveys as-is.** The State could continue using the EPA needs surveys without modifying or supplementing them. This is the cheapest and simplest approach, but exposes needs estimates to information gaps (see Report 1).
- 2. Modify the EPA needs surveys' estimates by using utilities' CIPs.** Since the EPA needs surveys exclude certain types of infrastructure and do not capture needs from all systems, the State could extrapolate needs survey figures using estimates based on local CIPs. This is the approach the EFC adopted for prior capital needs estimates (see Report 2).
- 3. Redesign the CWNS to use statistical sampling (for NC's internal use).** The State could replace or supplement the census methodology adopted by the CWNS with a statistical sampling approach to estimate wastewater infrastructure needs, which yields the same results with much less effort (see Report 3), and use the time saved to more accurately estimate each system's needs by analyzing their CIPs and project costs more thoroughly. This option would increase accuracy and precision as demonstrated in Report 3. Assuming that EPA will, at least for the time being, require states to continue using the current census approach for the CWNS, the statistical sampling methodology would have to be run concurrently with the current CWNS approach, requiring little more resources from the State (tracking needs documentation more closely for the sampled utilities). This would yield more accurate needs estimates for the State's *internal use*. If EPA later permits replacement of the CWNS census approach, this option would reduce the resources needed by the State to complete the needs survey (i.e. collect needs documentation from far fewer wastewater systems), and yield more accurate estimates.
- 4. Use LGC-collected financial data as a surrogate for capital needs and spending.** The audited financial data from local governments collected and compiled by the LGC every year can be used to provide a quick, but imprecise, assessment of the condition of utilities' assets and reinvestment schedules, and changes from year-to-year. However, the assessment will be limited to only local government utilities (see Report 4).
- 5. Expand Local Water Supply Plans or the Sanitary Surveys.** Since local governments are already required to submit Local Water Supply Plans and water systems must

participate in the Sanitary Surveys once every few years, the State of North Carolina could expand these programs to capture data that relevant to statewide needs assessments.

- 6. Conduct a separate statewide needs survey.** In order to avoid the issues associated with the national needs surveys, the State of North Carolina could design and conduct a separate survey to determine needs statewide. This survey could include additional information, such as funding and priorities of utilities. The NC Rural Economic Development Center implemented this approach in the early 2000's, for the "Water 2030" initiative.
- 7. Establish a database of infrastructure needs based on data collected from funding applicants.** Applicants to funding programs administered by DWI and SWIA provide some information about their capital needs. Additional data may be captured at the funding application stage, and all of the data can be compiled in a single database. Cooperation from other funding programs would enhance the data availability. This option would limit the infrastructure needs assessments to only utilities that apply for funding, but their needs estimates could be extrapolated to roughly gauge the statewide infrastructure needs. This is similar to an approach that some neighboring states implement (see Report 5).
- 8. Establish a statewide database of capital needs for utilities.** The State could establish a centralized database of capital needs for all water and wastewater systems statewide. The database could be used for asset management, capital planning and prioritization of projects at the local and regional levels, in addition to statewide needs assessment. This is similar to an approach that some neighboring states implement (see Report 5).
- 9. Develop a statewide GIS portal and infrastructure database.** This option represents an expansion of options 7 or 8. The primary difference is that data would include locational information, be incorporated into GIS software, and contain information about systems' assets in addition to their capital needs. Some neighboring states taking this approach have made needs data available through an online portal (see Report 5).



## Factors Affecting Implementation

This section provides a brief outline of the opportunities and challenges associated with implementation strategies for the assessment options listed above. In particular, it provides a discussion of factors affecting implementation within three broad focus areas: (1) Data Collection; (2) Program Structure; and, (3) Data Use. The intent is to provide a starting point for further discussion, not to outline all potential impacts or to present any single approach as preferable to another. Most of the listed concerns are based on conversations between EFC researchers and officials with direct knowledge of assessment programs in other states. The table at the end of this section is intended to facilitate high-level comparison between each assessment option.

### Data Collection

This subsection lists different strategies for collecting data on infrastructure needs from water and wastewater utilities statewide. The options are divided into two categories: (1) Submission Requirements; and, (2) Submission Methods. The approaches included in each category vary in terms of target population, administrative burden, and cost, but all have the potential to contribute to a comprehensive assessment of infrastructure needs.

#### Submission Requirements

- 1. Require for Funding Applicants:** Some states include the submission of total infrastructure needs or capital projects data (including for capital projects that are not part of the funding application) as a condition for all applications to state and federal funding programs. This approach provides a strong incentive for utilities to track current and future needs comprehensively at the local level, while ensuring data collection from a base population of systems statewide. Required information could include CIPs, engineering cost estimates, system design parameters to be used in cost curves, third-party verification of needs, regular updates on project status, and/or detailed project plans.

<i>Opportunities</i>	<i>Challenges</i>
<ul style="list-style-type: none"><li>• Mandated standardized application materials can be easily modified to require additional data or documentation</li><li>• Utilities have additional incentive to conduct regular capital planning</li><li>• Facilitates individual and contextual review of project proposals</li><li>• Easily combined with multiple program structures (but requires coordination between funding programs)</li><li>• Ensures base level of data completeness</li><li>• May be supplemented by other data collection efforts to extrapolate needs estimates to the entire state</li></ul>	<ul style="list-style-type: none"><li>• Not all utilities apply for funding, so data will be incomplete (but could be extrapolated)</li><li>• Data collected is exposed to selection bias (i.e. utilities applying for funding may have definitively different needs than those not applying for funding)</li><li>• Increased application costs and burdens for struggling utilities seeking funding assistance; difficult to predict the impact on future applications</li><li>• Increased administrative burden for DWI</li><li>• Coordination with other funding agencies is required</li></ul>

**2. Require Generally of all Utilities:** The State could require water and wastewater systems to submit infrastructure needs data or capital projects data on a recurring basis regardless of their intent to apply for public funding. This approach ensures data completeness at the statewide level, but would create significant administrative and financial burdens at the state and utility levels. Required information could include CIPs, engineering cost estimates, system design parameters to be used in cost curves, third party verification of needs estimates, project status summaries, and/or detailed project plans. The amount of information required and submission frequencies could vary according to system size to mitigate administrative burdens.

<i>Opportunities</i>	<i>Challenges</i>
<ul style="list-style-type: none"> <li>• Potential to conduct a census of needs</li> <li>• Encourages or mandates asset management and capital planning activities among all utilities</li> <li>• Submissions could be standardized if using a centralized database</li> <li>• Facilitates communication between utilities and regulators</li> </ul>	<ul style="list-style-type: none"> <li>• Significant increases in administrative costs for utilities and the State</li> <li>• Disproportionate burdens for large and small systems</li> <li>• Diminishing marginal returns for census approach versus statistical sampling</li> <li>• Diminishing marginal returns by adding the smallest systems</li> <li>• Political and legal implications</li> </ul>

**3. Don't Require, but Encourage:** Not all states that conduct regular assessments of infrastructure needs have formal requirements for data submission by water and/or wastewater systems. For example, Tennessee has achieved very high (> 90 percent) voluntary survey response rates for annual needs assessments without a legal mandate or tying submissions to funding applications. The amount of information included in a voluntary survey may affect participation rates, and it is important to effectively communicate survey benefits to all potential respondents. The officials we interviewed with exposure to this approach emphasized the importance of leveraging personal relationships with local officials to improve response rates.

<i>Opportunities</i>	<i>Challenges</i>
<ul style="list-style-type: none"> <li>• Potential for high response rates despite lack of mandate</li> <li>• Provides a vehicle for encouraging capital planning activities</li> <li>• Survey forms may be standardized</li> <li>• Voluntary participation creates goodwill between utilities and regulators</li> <li>• Asset Management grants may incentivize participation among small utilities</li> </ul>	<ul style="list-style-type: none"> <li>• Uncertainty of the response rate or quality of the submitted data</li> <li>• Requires extrapolation to obtain statewide estimates</li> <li>• Exposure to significant selection bias</li> <li>• Success partially dependent on personal relationships</li> <li>• Potentially less viable with top-down program structures</li> <li>• Significant recurring administrative and financial costs</li> </ul>

**4. Rely on Existing Data and National EPA Needs Surveys:** Many states choose not to conduct independent assessments of infrastructure needs for water and wastewater systems. Instead, they rely on estimates included in the national EPA needs surveys, or alternative data sources. The State of North Carolina, for instance, could use existing audited financial data from local governments to roughly estimate the capital needs of utilities and current reinvestment levels. Relying on existing data or surveys features the lowest administrative cost of all options in this section, but carries the risk of exposure to known information gaps (see Reports 1 and 4). Any of the other options included in this section could be designed to supplement rather than replace use of the national EPA needs surveys.

<i>Opportunities</i>	<i>Challenges</i>
<ul style="list-style-type: none"> <li>• Lowest administrative and set-up costs</li> <li>• Databases and data collection procedures are already in place</li> <li>• Does not require utilities to provide any additional data</li> <li>• Water utilities in the DWINSA sample are already familiar with the EPA needs survey and local governments repeatedly submit audited financial statements to the LGC</li> <li>• The EPA needs surveys are specifically tailored to inform SRF funding programs</li> </ul>	<ul style="list-style-type: none"> <li>• Significant information gaps: data in EPA needs surveys and audited financial data do not provide a comprehensive assessment of infrastructure needs</li> <li>• Limited scope: not all wastewater utilities are currently included in the CWNS which is designed to be a census of needs; not all utilities submit data to the LGC</li> <li>• Data in EPA needs surveys do not fit all NC needs</li> <li>• More difficult to integrate results with other programs</li> <li>• Requires extrapolation or manipulation of the data to estimate statewide needs.</li> </ul>

**5. Augment Existing Surveys:** Instead of creating a new survey or relying on estimates affected by known information gaps, the State could augment existing surveys to provide better information on utilities in North Carolina. The EFC has prepared a full report exploring whether or not replacing the census-style approach adopted by the CWNS with stratified sampling would improve accuracy overall (see Report 3). Other options include adding questions to Sanitary Surveys or the Local Water Supply Plans, using cost curves for ‘missing’ projects, and establishing a consistent timeframe for analysis.

<i>Opportunities</i>	<i>Challenges</i>
<ul style="list-style-type: none"> <li>• Low additional administrative and set-up costs</li> <li>• Provides more accurate needs estimates than the existing data and needs surveys</li> <li>• Could supplement with additional, related data</li> <li>• Potential methods already evaluated by</li> </ul>	<ul style="list-style-type: none"> <li>• Limited scope</li> <li>• Some significant information gaps will persist</li> <li>• More difficult to integrate results with other programs</li> <li>• The State would remain reliant on federal</li> </ul>

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EFC

survey timing for the EPA needs surveys

- Could be implemented as a gap measure while other programs and procedures are established
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## Submission Methods

**1. Digital Forms:** Some States have developed digitized data entry forms to facilitate submission of needs or capital projects cost data and funding applications for water and wastewater utilities. Information collected may include CIPs, engineering cost estimates, system design parameters to be used in cost curves, third party verification of needs estimates, locational information, project statuses, and detailed project plans. While front-end development costs for digital data collection may be higher, long-term advantages include the development of operationalized quality control measures, improved integration with analytical software, and simplified access to reporting functions for local utilities, as well as regional and state planners.

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### *Opportunities*

- Simple and paperless distribution
- Standardization and quality control
- Direct feed to centralized database
- Easy updates to new and existing submissions

### *Challenges*

- Higher set-up and ongoing administrative costs
  - Potential need for more training sessions and materials
  - Risk of over-engineering
  - Initial deployment may be more time consuming
  - Standardization of data can be challenging
  - Reliable access to the internet may be difficult for a few individuals
- 

**2. Paper Forms:** In lieu of establishing a digital survey, the State could utilize paper forms either collected by mail or completed through interviews with local representatives. The latter approach is used by regional associations in Tennessee in order to both establish and leverage relationships with utility officials. Paper forms may also be easier to use for some organizations. While it is potentially more difficult to implement quality control measures with paper forms, survey expenses may be lower in the short-term. Moreover, the use of paper forms could serve as a bridge during the development of digital survey methods.

<i>Opportunities</i>	<i>Challenges</i>
<ul style="list-style-type: none"> <li>• Lower set-up costs</li> <li>• Faster deployment than digital system</li> <li>• Avoids software compatibility or access to internet issues</li> <li>• Ability to transition to digital format at a later date</li> </ul>	<ul style="list-style-type: none"> <li>• Increased paper use</li> <li>• More difficult to implement quality control measures; prone to human errors</li> <li>• Responses may still need to be digitized</li> <li>• Moderate administrative burden</li> <li>• Expensive in the long term</li> </ul>

**3. Existing Documents:** Rather than designing a separate survey for water and wastewater infrastructure needs, the State of North Carolina could collect internal documents like CIPs and Asset Management Plans. This approach has the advantage of reducing administrative burdens on utilities, while also mirroring some aspects of the national needs surveys. Requiring utilities to submit such documents would also encourage utilities to create and maintain up-to-date plans for infrastructure investment. One downside, however, is that formats may not be standardized for all utilities, thereby exposing statewide efforts to biases related to varying time horizons, levels of completeness, and cost estimation methods. These documents could be submitted through the other data collection methods discussed above.

<i>Opportunities</i>	<i>Challenges</i>
<ul style="list-style-type: none"> <li>• Incentivizes capital planning and asset management efforts for utilities required or wishing to participate</li> <li>• Similar to documentation requirements for national EPA needs surveys</li> <li>• Lower reporting redundancy for utilities</li> <li>• Platform for standardizing utility-level planning</li> <li>• Lower set-up costs</li> </ul>	<ul style="list-style-type: none"> <li>• Incompleteness of data and documents</li> <li>• CIPs may exclude needs that do not fit within local budgets</li> <li>• Consistency of data and methods may vary from utility to utility</li> <li>• More difficult to collect geographic data and integrate with data displays</li> </ul>

## Program Structure

The State has several options for the structure of its assessment program. The options included in this subsection vary according to the allocation of responsibility for collecting, reviewing, and analyzing needs data between DWI and other groups/organizations. A review of programs adopted by other States that use these approaches is available in Report 5.

**1. Centralized:** DWI could elect to retain all—or nearly all—of the responsibility for collecting and analyzing needs data. Such an approach could take the form of a centralized database fed directly by submissions from utilities, or a top-down survey conducted by state-level staff. The former approach is used by the West Virginia Infrastructure and Jobs Development Council, allowing officials there to not only perform statewide needs assessments, but also carefully review project proposals and progress. Downsides of a centralized structure include

reduced exposure to local knowledge, increased administrative burdens for state officials, and potentially fewer opportunities to promote regional cooperation.

<i>Opportunities</i>	<i>Challenges</i>
<ul style="list-style-type: none"> <li>• Maintain strong control over data collection, quality control, and use</li> <li>• Increased ability to make and implement programmatic changes</li> <li>• Fewer administrative and coordination challenges</li> <li>• More direct relationship between state and local officials</li> </ul>	<ul style="list-style-type: none"> <li>• Higher state-level administrative burden</li> <li>• Potentially less opportunity to leverage local knowledge/relationships</li> <li>• May be more difficult to organize technical assistance programs</li> <li>• Risk of over-engineering centralized data collection/storage system</li> </ul>

**2. Strong Regional:** The State of North Carolina could also establish a strong regional approach that relies on regional organizations for the collection and review of funding applications and infrastructure needs data. The State of Kentucky, for example requires all projects to be approved by regional Area Development Districts before utilities may apply for state funding or upload project details to a statewide database. These districts also produce regional prioritization lists and needs assessments that inform the statewide water and wastewater management plans. This approach encourages regional cooperation and provides a forum for improved coordination between utilities.

<i>Opportunities</i>	<i>Challenges</i>
<ul style="list-style-type: none"> <li>• Mitigate challenge of working over large geographies</li> <li>• Create regional forums for technical assistance, training, and coordination</li> <li>• Foster regional view of infrastructure development</li> <li>• Leverage local knowledge for project review and prioritization</li> <li>• Utilities may be more comfortable working with local representatives</li> </ul>	<ul style="list-style-type: none"> <li>• Establishing and funding regional groups</li> <li>• Clarifying roles of utilities, regional groups, DWI and SWIA</li> <li>• Standardization may be more difficult</li> <li>• Consistency across regional areas may vary</li> <li>• Issues may take more time to elevate to State officials</li> </ul>

**3. Weak Regional:** A weak regional approach would use regional associations to assist with surveys, but would not require utilities to seek regional review, evaluation, or approval before applying to state funding programs. The State of Tennessee adopts this strategy by paying regional councils to survey water and wastewater systems to collect infrastructure needs data. Despite the lack of a legal mandate for utilities to participate in the surveys, Tennessee officials reported that they regularly achieve over 90 percent participation rates. This success was attributed to the power of existing relationships between regional and local officials. While coordination may be more complicated, this approach would allow DWI to allocate less staff time to the needs assessment, and may reduce the need to hire additional staff.

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### *Opportunities*

- Mitigate challenge of working over large geographies
- Utilities may be more comfortable working with local representatives
- Retain review, evaluation, and approval functions at state level
- Reduced state-level administrative burden for data collection

### *Challenges*

- Establishing and funding regional efforts
  - Clarifying roles of utilities, regional groups, DWI and SWIA
  - Consistency across regional areas may vary
  - Less opportunity for coordination among utilities than strong regional approach
  - Providing incentive for participation without tying it to funding applications
- 

## Data Use

Once needs data are collected, the State of North Carolina has several options for how and when to produce summaries and reports. Moreover, needs data could be used for other purposes such as project review, formalized cooperation between utilities, and simplified funding applications. This section outlines implementation considerations for options related to assessment reports and other data uses.

### Assessment Options

The timing and organization of reports is an important factor to consider when designing an assessment program. From a timing perspective, DWI could elect to schedule recurring reports, or simply be prepared to produce ad hoc analyses as needed. Of course, DWI could also establish a regular reporting schedule and supplement it with custom reports as needed. The advantages of each approach are summarized below:

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#### *Recurring*

- Opportunity for automation
- Easier to establish and notify readers and users
- Standard time intervals facilitate comparisons
- Improved ability to demonstrate impacts and monitor plan implementation
- More frequent and timely adjustments to the Master Plan and other SWIA activities as needed
- More frequent communication with legislators and other parties

#### *Ad Hoc*

- Less need to establish formal reporting mechanisms
  - Ability to tailor reports to specific information requests/needs
  - Could still be used to demonstrate impacts and monitor plan implementation, but at a reduced capacity
  - Lower costs
- 

From an organizational standpoint, the water and wastewater infrastructure needs reports produced by other states take multiple forms. In general, however, they may be characterized as either statewide summaries, or aggregations of regional summaries. The most prominent

example of the regional summary approach comes from Kentucky, where each of the State’s 15 Area Development Districts produces its own needs assessment and regional priority list. The full versions of Kentucky’s Water and Wastewater Management Plans go beyond the regional level and include county summaries as well. Other states, like West Virginia, produce reports that only provide statewide needs summaries. The choice regarding report structure should be made in light of the report’s anticipated applications and users.

**Non-Assessment Options**

**1. E-Clearinghouse:** A comprehensive dataset covering water and wastewater infrastructure needs would essentially scope the market for one type of infrastructure investment in North Carolina. This information would be valuable not only to regulators and public officials, but also to funding agencies and other organizations. North Carolina could therefore use collected needs data to establish an E-Clearinghouse or supplement the Funders Forum/Fairs that connects utilities with potential funding sources. The State of Kentucky has adopted a similar program that uses submitted project descriptions and other needs data to connect utilities with funding partners. The E-Clearinghouse is integrated with other systems such that applications are automatically updated with information housed in a central data system, and multiple funders are allowed to participate in the same project.

<i>Opportunities</i>	<i>Challenges</i>
<ul style="list-style-type: none"> <li>• Improve utility access to funders</li> <li>• Integrate with other data systems</li> <li>• Encourage greater participation from private funding sources</li> </ul>	<ul style="list-style-type: none"> <li>• Establishing and funding the forum</li> <li>• Creating guidelines and policies</li> <li>• Notifying funders and getting them to use the forum</li> </ul>

**2. Project Review:** Some states require utilities to submit detailed project descriptions with funding applications. These project profiles not only inform needs assessments, but also allow officials to perform technical review and consider opportunities for regionalization. For example, the State of West Virginia requires utilities to submit detailed budget, design, and timing information for every proposed project. Utilities in West Virginia must also submit due diligence documents and bids from contractors for different components of each project. While West Virginia’s review is conducted at the state level, other states conduct project review through regional organizations. Regional project review is intended to help facilitate coordination among utilities and highlight opportunities for regionalization.

<i>Opportunities</i>	<i>Challenges</i>
<ul style="list-style-type: none"> <li>• Ensure technical feasibility and need</li> <li>• Establish and enforce proposal guidelines</li> <li>• Enable state officials to make recommendations</li> <li>• Improve coordination between agencies and utilities</li> </ul>	<ul style="list-style-type: none"> <li>• Higher administrative burden for systems and state officials</li> <li>• Higher application costs for systems</li> <li>• Perceptions about loss of local control</li> <li>• Extended application and funding timelines</li> </ul>



**3. Regionalization:** If the State of North Carolina adopts a regional approach to collecting needs data, it could use regional organizations as a platform for project review and coordination. For example, the State of Kentucky channels infrastructure needs and project profiles through Area Water Management Councils (AWMC) composed of mayors, operators, engineers, planners, local health officials, and representatives of for-profit utilities. AWMCs meet quarterly and by statute assume the role and function of long range planning efforts for the utilities in their jurisdiction. One Kentucky AWMC website says the meetings “give members the opportunity to coordinate plans and projects to avoid duplication of service, ensure consistency with local and regional land use plans, and promote cost-effectiveness.” These organizations could also be key partners in the implementation of regionalization schemes and training programs.

<i>Opportunities</i>	<i>Challenges</i>
<ul style="list-style-type: none"> <li>• Improve consistency of local and regional plans</li> <li>• Encourage communication between officials</li> <li>• Provide additional context for prioritization</li> </ul>	<ul style="list-style-type: none"> <li>• Establishing and funding regional efforts</li> <li>• Clarifying roles of utilities, regional groups, DWI and SWIA</li> <li>• Overcoming skepticism</li> </ul>

**4. Access & Availability:** Data on planned infrastructure investment is valuable to many stakeholders outside state regulatory and funding agencies. The State of North Carolina should therefore consider options for allowing public access to needs data. Many other states have adopted this approach with varying levels of detail. West Virginia and Kentucky allow anyone to access detailed information on individual projects as well as higher-level data about needs in general. Alternatively, the State of Tennessee displays survey results—aggregated at the county level—to an online mapping system that allows direct downloads. One issue to consider is security. After consulting with federal security officials, the State of West Virginia decided not to publically display the exact location of treatment plants and water intakes. Set-up and ongoing hosting costs for an online data display and sharing portal could be mitigated through partnerships with local colleges and universities or research institutions.

<i>Opportunities</i>	<i>Challenges</i>
<ul style="list-style-type: none"> <li>• Contribute to transparency and open government</li> <li>• Allow outside researchers to contribute to decisions and analyses</li> <li>• Provide public evidence of SWIA’s impacts statewide</li> <li>• Help communicate needs to other public officials and agencies</li> </ul>	<ul style="list-style-type: none"> <li>• Security concerns</li> <li>• Set-up and hosting costs</li> <li>• Potential for misinterpretation by outside parties</li> </ul>

## Comparison Table

Option	Data Collection	Program Structure	Data Use	Comprehensiveness <sup>†</sup>
1) Use EPA Needs Surveys	Already Required	No Change Required	Every 4 Years. E-clearinghouse for many wastewater projects.	Low Precision, Accuracy, and Completeness
2) Extrapolate from EPA Needs Surveys	Some Additional Requirements (need more CIPs and documentation)	No Change Required. Requires low additional State resources.	Every 4 Years. E-clearinghouse for many wastewater projects.	Low Precision, Moderate Accuracy, and Low Completeness
3) Redesign CWNS (for NC internal use)	Some or No Additional Requirements (may need more CIPs and documentation)	No Change Required. Same or less than current State resources required.	Every 4 Years. Almost no non-assessment options.	Low Precision, Moderate Accuracy, and Low Completeness
4) Use financial data from LGC	Already Required	No Change Required. Requires low additional State resources (or more to include non-governmental utilities).	Annual. Access and availability of financial data but none on needs or project data.	Moderate Precision, Low Accuracy, and Low Completeness
5) Expand Local Water Supply Plans or Sanitary Surveys	Some Additional Requirements (more questions and requests for documents)	No Change Required. Requires high additional State resources and coordination.	1-3 Yearly. Project review, regionalization, e-clearinghouse.	Moderate Precision, Accuracy, and Completeness
6) Separate Statewide Survey	Significant Additional Requirements	New Structure. Centralized, Strong Regional, or Weak Regional	Recurring or Ad Hoc. Access and availability of data, potential e-clearinghouse.	High Precision and Accuracy, Moderate Completeness
7) Funding Applicant-Only Database	Some Additional Requirements (request additional project lists)	No Change Required. Requires high additional State resources and coordination.	Recurring or Ad Hoc. Project review, regionalization, partial e-clearinghouse and access.	High Precision and Accuracy, Low Completeness
8) Comprehensive Statewide Database	Significant Additional Requirements	New Structure. Centralized, Strong Regional, or Weak Regional.	Recurring or Ad Hoc. Project review, regionalization, full e-clearinghouse and access.	High Precision, Accuracy, and Completeness
9) Statewide GIS Database	Most Significant Additional Requirements (same as above + location data)	New Structure. Centralized or Strong Regional.	Recurring or Ad Hoc. Project review, regionalization, full e-clearinghouse and access.	High Precision, Accuracy, and Completeness

Darker shades of red indicate relatively greater complexity/costs and/or relatively lower benefits than other options.

<sup>†</sup> Accuracy = how close the needs estimate will be to systems' true needs. Precision = how narrow the range of needs estimates will be. Completeness = how much of all systems' needs will be captured in the data.