

**Advancing Water Infrastructure
Competitiveness in North Carolina
Recommendations for Sustainable Economic Development in
Partnership with North Carolina Water and Wastewater Utilities**

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Abstract

Water and wastewater utilities sit at the intersection of public health protection, environmental stewardship, and economic development. The North Carolina Chamber Foundation’s Water Infrastructure Competitiveness Analysis (Intera Incorporated & LDA Engineering, 2025) offers a bold vision to align water infrastructure with statewide economic ambitions. While many utility leaders will support the objective of strengthening North Carolina’s competitiveness, they will also recognize a set of parallel concerns: potential misalignment with utilities’ public health mission, the risk of unfunded mandates, complex regionalization dynamics, current hydrologic constraints, questions about cost responsibility, public–private partnership (PPP) risks, additional regulatory burdens, threats to local autonomy, and workforce limitations. Drawing on research from public administration, business administration, and water-sector scholarship, as well as resources from the UNC Environmental Finance Center (EFC), the Water Research Foundation (WRF), and national reports, this paper explores those concerns and identifies pragmatic mitigation strategies.

The argument advanced here is that with thoughtful design, the North Carolina Chamber’s recommendations can be implemented as a genuine win–win: with utilities remaining or becoming financially and operationally viable, while the state strengthens its platform for long-term economic growth. Economic impact studies from Charlotte Water and the Cape Fear Public Utility Authority also demonstrate that utility-funded water and wastewater projects themselves generate substantial economic output and employment, underscoring that investments in core infrastructure are among the state’s most productive development tools.

Introduction

As Executive Director of Cape Fear Public Utility Authority (CFPUA), I view economic development not as an external pressure but as a core driver of my organization’s long-term health. Growing industrial, commercial, and residential demand can stabilize revenues, support necessary capital reinvestment, and help spread the fixed costs of water and wastewater services over a broader base. Empirical work at the national level underscores that water infrastructure investment generates significant economic and employment benefits, both directly within the sector and indirectly through increased productivity across the broader economy (American Society of Civil Engineers [ASCE] & US Water Alliance, 2024; US Water Alliance & Value of Water Campaign, 2020).

For this reason, I am philosophically and intellectually inclined to support the findings and recommendations from the North Carolina Chamber Foundation’s Water Infrastructure Competitiveness Analysis (Intera Incorporated & LDA Engineering, 2025). The report accurately notes that water availability, reliability, and quality increasingly

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shape site selection decisions and can either accelerate or constrain economic opportunities.

At the same time, my peers across the state represent a wide diversity of system sizes, governance structures, and financial capacities. Most utilities operate under tight staffing constraints, aging asset burdens, and complex regulatory demands, as documented in recent surveys by the UNC Environmental Finance Center and the North Carolina statewide water and wastewater infrastructure master plan (North Carolina Department of Environmental Quality [NC DEQ], 2017; UNC Environmental Finance Center [UNC EFC], 2025).

The purpose of this white paper is to articulate, in a constructive and collaborative tone, both the concerns utilities are likely to have when reviewing the Chamber's recommendations and the evidence-based strategies that could mitigate these concerns. My intent is not to slow or dilute the economic development agenda but to strengthen it by ensuring that implementation is realistic, equitable, and aligned with utilities' foundational public service obligations. When the perspectives of economic developers and utilities are aligned, North Carolina gains not just short-term wins in site recruitment, but durable, long-term competitiveness grounded in resilient and well-governed infrastructure.

Context: Water Infrastructure, Economic Development, and Utility Governance

A substantial body of research in public administration, economics, and water policy establishes that water infrastructure is tightly linked to economic performance. Analyses by the Value of Water Campaign and their partners estimate that sustained water infrastructure investment at modern levels can generate substantial job creation and Gross Domestic Product (GDP) gains, while underinvestment leads to lost economic output and job losses (ASCE & US Water Alliance, 2024; US Water Alliance & Value of Water Campaign, 2020).

Similar work highlights how water infrastructure influences industry location, household well-being, and local wage and spending patterns (Water Finance Exchange, 2023). Global perspectives underscore the “unspoken value” of water infrastructure in managing climatic risks, supporting food and energy security, and avoiding the hidden economic costs of system deterioration (Valero et al., 2025).

At the same time, public administration scholars emphasize that water and wastewater utilities are not simply growth engines. They are essential service providers with high public health stakes and long-lived capital assets, requiring careful oversight and prudent risk allocation (Beecher, 2013; Beecher & Kihm, 2016). Water services carry significant public health and environmental externalities, meaning that decisions about capacity,

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rates, and expansion must balance economic development with core obligations to provide safe, reliable, and affordable service (Beecher, 2014).

The literature on regionalization, consolidation, and utility partnerships further underscores both opportunities and risks. North Carolina is a national leader in the research of these topics. Studies by UNC EFC show that regional collaborations can improve financial viability and regulatory compliance for small and struggling systems, but political, financial, and governance barriers remain significant (Eskaf, 2021; UNC EFC, 2025). WRF research on utility partnerships concludes that, while joint projects and shared services can deliver tangible benefits, the number of regional agreements remains limited due to perceived and real obstacles around autonomy, rate impacts, and risk sharing (Water Research Foundation, 2019).

Within this context, the Chamber's competitiveness agenda is both timely and promising. Yet its success depends on how well it aligns with utility realities: constraints of hydrology and assimilative capacity, the need to allocate infrastructure costs fairly, the design of PPPs, the pace and structure of regulation, and the capacity of the water workforce will be topics of concern.

Anticipating the Concerns of Utility Leadership

Water and wastewater utility leaders are well connected through multiple trade and professional organizations. Nationally, our industry is served by the American Water Works Association (AWWA), the Water Environment Federation (WEF), the Association of Metropolitan Water Agencies (AMWA), the National Association of Clean Water Agencies (NACWA), and the National Rural Water Association (NRWA). North Carolina has state-level sections and member associations for AWWA and WEF. The North Carolina water and wastewater utility industry is also fortunate to have both the North Carolina Water Quality Association (NCWQA) and the North Carolina Rural Water Association (NCRWA), which are state-level trade organizations and the primary policy voice for our industry in North Carolina. With many years of experience working with North Carolina utility leaders through these various organizations, I offer the following thoughts and perspectives.

Concern #1: Balancing Economic Development and Utilities' Other Missions

North Carolina utility executives are likely to support economic development only if they can simultaneously honor their fiduciary responsibilities and their statutory obligations under the Safe Drinking Water Act and Clean Water Act. Beecher notes that water utilities occupy a distinctive regulatory and governance space because they provide essential services with high public health stakes and long-lived assets (2014).

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If economic development incentives pressure utilities to commit capacity quickly or speculatively, there could be a danger that business risk will shift from developers and/or the state to utilities and their ratepayers.

Regulatory scholarship emphasizes that frameworks must carefully define how risk and reward are shared among utilities, customers, and other stakeholders (Beecher, 2013; Beecher & Kihm, 2016). The Chamber report's narrative, which positions water infrastructure strongly as an economic development lever (Intera Incorporated & LDA Engineering, 2025), may cause some utilities to worry that their core mission could become subordinated to growth objectives if implementation is not carefully structured.

Concern #2: Unfunded Mandates and Data Modernization

The Chamber report calls for expanded statewide data collection and analysis, including improved withdrawal tracking, low-flow and assimilative capacity modeling, and integrated water data systems (Intera Incorporated & LDA Engineering, 2025). These improvements would unquestionably enhance planning at the state level. An important concern will be that water and sewer utilities, especially small and rural systems, are already under significant administrative strain. UNC EFC's 2024 management survey documents widespread concerns about staff capacity, regulatory compliance workload, and the administrative burden of external reporting (UNC EFC, 2025). The U.S. Environmental Protection Agency (EPA) has similarly noted that utilities face constraints related to asset management, cyber and physical security, and compliance reporting, even before additional data requirements are imposed (U.S. Environmental Protection Agency [US EPA], 2025).

Without explicit funding and technical assistance, utilities may reasonably perceive certain data modernization initiatives as unfunded mandates that divert scarce resources from operations, maintenance, and capital reinvestment.

Concern #3: Regionalization - Benefits, Barriers, and Perceptions

Regionalization has long been promoted as a strategy to achieve economies of scale, enhance compliance, and improve financial viability (National Association of Regulatory Utility Commissioners [NARUC] & National Regulatory Research Institute [NRRI], 1996; River Network, 2022; US Water Alliance, 2022). The Chamber report builds on this logic, highlighting opportunities for multi-jurisdictional collaboration and regionalized water supply and wastewater solutions (Intera Incorporated & LDA Engineering, 2025). Recent commentary frames regionalization as a way to position utilities as regional economic development partners, but it also cautions that there is no one-size-fits-all model and that governance design is critical (US Water Alliance, 2022; Water Finance Exchange, 2023).

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UNC EFC's work indicates that while regional partnerships can improve viability for small systems, they often encounter political concerns over loss of local control, fears of rate increases, and the complexity of merging systems with different asset conditions and debt profiles (Eskaf, 2021; UNC EFC, 2025). WRF's *Water Utility Partnerships: Resource Guide and Toolbox* similarly finds that governance, rate harmonization, and trust issues frequently delay or derail regionalization efforts despite clear technical benefits (Water Research Foundation, 2019).

Concern #4: Hydrologic and Environmental Constraints

The Chamber report notes that updated hydrologic analyses, increased drought frequency, and tighter water quality standards may reduce the assimilative and withdrawal capacity available for new development in some basins (Intera Incorporated & LDA Engineering, 2025). Global, national, and North Carolina specific studies reinforce the idea that water availability and quality limitations represent hard constraints that cannot be overcome by planning alone (Valero et al., 2025; Zhang et al., 2025). In North Carolina, there are hard limits on available storage and new storage is extremely difficult to permit and construct. In addition, analyses of low-flow characteristics and flow-duration statistics in North Carolina have shown that drought and climatic variability are affecting streamflows and, in turn, influence NPDES and water supply permitting decisions (Weaver, 2016; Raczyński & Dyer, 2022).

From a utility perspective, there is concern that economic development narratives may overpromise what is hydrologically feasible without new water sources or storage, placing utilities in the politically difficult role of denying or delaying service extensions when natural or regulatory constraints are binding. This closely aligns with the same concerns raised by the Chamber report.

Concern #5: Infrastructure Cost Allocation and Ratepayer Protection

Public finance literature and applied practice stress that “growth should pay for growth” when it comes to infrastructure expansion (Ehlers, 2023). UNC's School of Government has examined system development fees in North Carolina and concluded that, while imperfect, they are among the few tools that allow utilities to recover at least a portion of the capital costs associated with serving new development (Millonzi, 2025). Legal commentary on wastewater impact fees also illustrates national debates about how far local governments can go in requiring developers to pay for capacity expansions warranted by growth. In North Carolina, system capacity fees are strictly defined and still subject to class-action litigation in the aftermath of Quality Built Homes, Inc. v. Town of Carthage, 369 N.C. 15, 789 S.E.2d 454 (2016) and its progeny.

Utility executives may worry that competitiveness agendas that prioritize rapid infrastructure deployment for industrial recruitment could, without clear policy

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guardrails, lead to cross-subsidization of growth by existing ratepayers, especially in cases where promised development fails to materialize or underperforms.

Concern #6: Public–Private Partnerships: Opportunities and Risks

The Chamber report’s suggestion to expand Public–Private Partnerships (PPPs) aligns with a broader trend of exploring private capital and expertise in the water sector. Reviews of PPPs in water suggest both promising examples and cautionary tales, noting that risk allocation, tariff design, and governance arrangements determine whether PPPs actually benefit the public (Lima et al., 2021). A recent paper on PPPs in U.S. rural water infrastructure highlights challenges related to transaction complexity, capacity constraints at small utilities, and the risk of misaligned incentives (Sowby et al., 2025).

Policy briefs from the Bush School of Government and Public Service emphasize that PPPs can shift demand and revenue risk onto either the utility or the private partner depending on contract design, and that poorly structured deals can affect affordability and equity (Gilliland & Gaines, 2021). The US Water Alliance has underscored the need for transparent governance, stakeholder engagement, and robust performance metrics to ensure PPPs support long-term public goals as well as short-term financial gains (US Water Alliance, 2023).

From a utility perspective, these findings translate into cautious support for PPPs as tools, not panaceas. Executives will seek assurance that PPPs do not compromise public ownership of core assets or expose ratepayers to uncontrolled cost escalation.

Concern #7: Additional Regulation and Permitting Timelines

The Chamber report recommends enhanced regulation in critical hydrologic regions to better manage scarce resources (Intera Incorporated & LDA Engineering, 2025). While utilities generally support sound environmental and resource management, they also experience slow permitting timelines. Adding regulatory layers without commensurate efficiency improvements could hinder both utility projects and industrial development. EPA’s Environmental Financial Advisory Board (EFAB) and Water Infrastructure and Resiliency Finance Center have explored funding and policy strategies to promote regionalization and shared projects, emphasizing that regulatory and financing structures must be aligned to avoid delaying beneficial consolidation or capacity expansion (US EPA, 2025).

Concern #8: Statewide Planning and Local Autonomy

Advocates for a statewide Water Competitiveness Plan see strong potential in aligning land use, water resources, and infrastructure capacity across regions (Intera Incorporated & LDA Engineering, 2025). While true, it is also true that regionalization literature emphasizes that governance should consider local context, and that top–down models often encounter resistance (NARUC & NRRI, 1996; River Network, 2022).

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Commentaries on regional water governance advise that reforms succeed when they are co-designed with local leaders and when utility autonomy and public accountability are preserved (Water Finance Exchange, 2023).

Utility board members and local elected officials may worry that a statewide plan could eventually become a mechanism for reordering local capital priorities without adequate local consent.

Concern #9: Workforce Capacity as a Binding Constraint

Finally, the workforce challenge looms large. EPA’s 2024 interagency report on the water workforce notes high rates of retirement eligibility, recruitment challenges, and the need for expanded training and apprenticeship programs across drinking water, wastewater, and stormwater utilities (US EPA, 2024). An earlier U.S. Government Accountability Office (GAO) report likewise documents concern about the ability of utilities to maintain sufficient certified operator staffing in the face of demographic shifts (U.S. Government Accountability Office, 2018). The EFC Network’s analysis of “hidden workforce challenges” further emphasizes that one-third or more of operators may be eligible for retirement within a decade and that knowledge transfer and succession planning are pressing issues (Environmental Finance Center Network, 2023).

Academic work, such as a quantitative case study on the water workforce in Tennessee, confirms that recruitment and retention difficulties are widespread and correlated with wage levels, working conditions, and perceptions of the industry (Paxton et al., 2022). These trends suggest that any ambitious strategy requiring more complex planning, regionalization, data reporting, and project delivery must be paired with equally ambitious workforce development strategies, if it is to succeed. Here again utility concerns closely align with concerns raised by the Chamber report.

Evidence-Informed Strategies to Mitigate Utility Concerns

Each of these concerns may create barriers that hinder efforts to improve strategic coordination among industrial and business developers, utilities, and state agencies. Fortunately, each concern can be mitigated, allowing for collective “win-win” strategies to take hold.

Mitigation Strategy #1: Reaffirming the Dual Mission

The literature on utility regulation emphasizes that risk allocation and public interest obligations must anchor policy reforms (Beecher, 2013; Beecher & Kihm, 2016). A practical way to honor this in North Carolina is to explicitly frame the statewide competitiveness agenda as having a dual mission: economic development and public health protection. The Water Competitiveness Plan envisioned by the Chamber can incorporate a clear statement that regulatory compliance, drinking water safety,

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wastewater treatment performance, and affordability are non-negotiable conditions for all economic development-oriented infrastructure decisions.

This dual mission framing is consistent with work on balancing water sustainability and high-quality economic development, which calls for integrated approaches that recognize environmental carrying capacity while pursuing growth (Zhang et al., 2025). Within this framework, utilities become co-equal partners in economic development, not merely service providers tasked with enabling growth.

Mitigation Strategy #2: Funding and Phasing Data Modernization

While much of the data modernization would occur at the state-level, invariably data collection efforts will “trickle down” to utilities who will be asked to provide new, refined, and more frequent information. The experience of utilities documented by UNC EFC and others suggests that successful data initiatives pair new requirements with targeted support (UNC EFC, 2025; US EPA, 2025). North Carolina can build on this by creating a Water Data Modernization Fund through the Division of Water Infrastructure, supporting investments in metering, SCADA integration, geographic information systems, asset management systems, and new machine learning/artificial intelligence to improve data collection and organization efficiency.

A phased rollout that begins with pilot regions—such as basins already experiencing growth or stress—would allow the state to refine data standards and technical support tools before statewide implementation. Tools developed by the EFC Network, such as their water and wastewater rates analysis model, show how standardized approaches can lower the administrative burden on smaller systems by providing shared templates and analytic frameworks (Environmental Finance Center Network, 2024). The same logic can be applied to water data: provide templates, training, and shared platforms to minimize customization burdens on individual utilities.

Mitigation Strategy #3: Regionalization as Voluntary, Flexible, and Supported

Evidence from UNC EFC, River Network, WRF, and other organizations converges on several design principles for successful regionalization: respect for local autonomy, flexibility in partnership forms, and state support for transaction costs and transitional inequities (Eskaf, 2021; Environmental Finance Center Network, 2024; River Network, 2022; Water Research Foundation, 2019). North Carolina’s existing Merger and Regionalization Feasibility Grants already provide a foundation for such support. CFPUA has been a beneficiary of such grants to foster recent regionalization activities. This experience confirms that targeted grants work to bring systems together.

The state can also encourage a spectrum of regional arrangements, from shared services and interconnections to full consolidations, rather than promoting a single model. Small systems may begin with mutual aid, shared billing or laboratory services, or wholesale

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arrangements; larger regional authorities may emerge only where there is a clear multi-party benefit and local political will. To mitigate concerns about rate impacts, transitional state funding can help smooth convergence of rates and support capital investments needed to bring weaker systems into compliance. EPA's EFAB report on funding strategies for regionalization and the State Water Infrastructure Authority's master planning work both underscore that targeted financial incentives can encourage voluntary consolidation while preserving local decision-making authority (NC DEQ, 2017; US EPA, 2025).

Mitigation Strategy #4: North Carolina Needs More Water Storage

The Chamber's report correctly recognizes that hydrologic constraints, low flows, drought recurrence, nutrient-sensitive waters, and assimilative capacity ultimately limit the water supply available to support new development (Intera Incorporated & LDA Engineering, 2025).

Notably, the strategic utilization of reservoir storage within already-regulated basins, including new reservoirs, can materially enhance safe yield, operational flexibility, and drought resilience, particularly in regions where projected growth substantially exceeds existing system capacity. Better utilization of existing water resources, however, will not be enough to sustain the State's growth. Too many North Carolina river basins have only one or two large reservoirs to serve regional needs. Those basins have arguably reached a tipping point in terms of available water supply. The contrast between the Triangle region (Raleigh-Durham-Cary/Chapel Hill) and the Charlotte metropolitan area illustrates this concern clearly.

In the Triangle, public water supply relies heavily on two major federally managed reservoirs; Falls Lake on the Neuse River and B. Everett Jordan Lake on the Haw/Cape Fear system. Water supply from these two federal reservoirs is supported by a set of smaller municipal reservoirs including Lake Michie, Little River Reservoir, Cane Creek Reservoir, and University Lake, as well as Lakes Benson and Wheeler in Wake County (Diaz & Fanelli, 2024; Triangle Water Supply Partnership [TWSP], 2025). Unlike the Charlotte region, which benefits from a cascade of eleven major Duke Energy reservoirs on the Catawba–Wateree River system, the Triangle has comparatively limited large-scale storage capacity relative to its rapid population growth (Catawba-Wateree Water Management Group, 2014; TWSP, 2025).

This disparity in available system storage influences drought resilience and the ability to serve new industrial, commercial, and residential development, identifying the Triangle as a primary area of focus for statewide water development needs.

At the November 2025 meeting of the Water Allocation Committee (WAC) of the North Carolina Environmental Management Commission (EMC), the Triangle Water

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Partnership presented the latest update to the Triangle Regional Water Supply Plan. This report noted that the Triangle region will need to acquire an additional 50 MGD of water in the near to mid-term, an additional 138 MGD of water by 2050, and an additional 220 MGD of water by 2070 (TWSP, 2025). This magnitude of demand cannot be supported reliably without additional regional storage, given current reservoirs and run-of-river limitations.

Even in the Catawba-Wateree Basin, despite far more storage, the Water Supply Master Plan estimated that several reservoirs would approach their safe yield by mid-century, prompting an evaluation of storage optimization strategies including operational changes, demand management, and modest increases in active storage (Catawba-Wateree Water Management Group, 2014). This basin, however, is far better positioned to support growth both within and adjacent to the river basin than many others across the state.

The level of effort necessary to make better use of federal resources and create new reservoir storage is beyond the capabilities of water utilities alone. A state-led effort will be required to make this a reality. Significant regulatory barriers exist and environmental advocacy groups are on record opposing existing and new impoundments. Opportunities for compromise, however, are available. Rivers that are already hydrologically impacted by reservoirs are better candidates for new storage than those currently without impoundments, and robust mitigation programs can provide environmental protection and enhancement that justify the trade-offs that come with new storage.

Better utilization of existing reservoir storage is also viable, but the sharing of those water resources within and across river basins cannot come at the expense of downstream water users. The economic vitality of downstream North Carolina communities depends on reliable river flows, which requires the limited use of permanent interbasin transfers from source river basins with limited reservoir storage.

In addition to the question of storage, the hydrologic literature and the Chamber report both highlight the limits imposed by low flows, drought, and assimilative capacity (Intera Incorporated & LDA Engineering, 2025; Valero et al., 2025; Weaver, 2016; Zhang et al., 2025). An effective mitigation strategy is to ensure that these constraints are explicitly reflected in the tools used by state and regional economic development partners, while the State and stakeholders develop new storage.

This can include a hydrologic feasibility layer in site selection and land-use planning platforms, indicating areas where water supply, discharge capacity, or both are approaching critical thresholds. Economic development projects proposed in such zones could then be required to incorporate advanced water strategies, such as reuse, onsite pretreatment, or reduced demand processes, from the outset. WRF and related research have shown that appropriately designed water reuse and demand management projects

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can significantly reduce net water footprints without compromising economic benefits (Quinn et al., 2014; Water Research Foundation, 2020).

By embedding hydrologic information upstream in planning processes, the state reduces pressure on utilities to reject projects late in the process and instead encourages developers to internalize water constraints in their initial designs.

From a utility executive perspective, the practical takeaway from these issues is that hydrologic constraints should not simply be viewed as static limits but as management challenges that can be improved through additional and optimized storage, interconnections, off-channel storage, and improved withdrawal access. It can also be improved through better demand side management and better information sharing around water supply constraints while new storage options are developed.

For the competitiveness agenda to succeed, North Carolina must recognize that many regions, especially the Triangle, require expanded, climate-resilient storage capacity in order to support safe, reliable service for existing and future customers.

In short, responsible growth requires realistic hydrology, and realistic hydrology requires a responsible storage strategy.

Mitigation Strategy #5: Clarifying Cost and Applying “Growth Pays for Growth”

To mitigate concerns about ratepayer cross-subsidization, North Carolina can better formalize cost allocation principles around growth, drawing from both theory and existing practice. Water and sewer system development fees, authorized by general statutes passed in the aftermath of the *Quality Built Homes Inc. v. Town of Carthage* case, cannot be designed to subsidize ongoing operation, thus the risk of cross-subsidization by development of existing customers no longer exists.

Furthermore, public finance guidance emphasizes that system development fees are important tools for making growth-related infrastructure self-financing (Ehlers, 2023). The North Carolina General Assembly has sought several times to clarify utility authorities to develop and charge system development fees. UNC’s analysis of system development fee legislation in North Carolina attempts to clarify legal boundaries and the structured mechanism for allocating costs to development. UNC’s work also helps utilities understand how such fees can be used to satisfy new infrastructure demands in a self-sustaining “growth pays for growth” investment cycle (Millonzi, 2025).

New and on-going class-action lawsuits, however, indicate that more work is needed. Legislation is required to end ongoing and future speculative litigation regarding this new area of law and ensure system development fees are not lost to predatory class-action attorneys. The State Chamber can and should play a key role in addressing the problem of predatory litigation to seize collected fees. Only then can utilities and their ratepayers

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have confidence that system development fee revenue will be available to support orderly growth to avoid ratepayer cross-subsidization of that growth.

Within the Water Competitiveness Plan, the state can endorse a policy that growth-related capacity expansions serving specific industrial or commercial projects should be funded primarily by the beneficiaries, through direct contributions, reinvestment of system development fees, and state economic development grants; while core investment needed to maintain existing service continues to be funded through traditional, existing customer rate structures. This distinction between platform investments and project-specific investments encourages mutually beneficial growth while preserving ratepayer equity.

Mitigation Strategy #6: Structuring PPPs with Clear Guardrails

As PPPs are considered, the literature suggests several safeguards that can help ensure they advance public goals. Reviews of PPPs in the water sector stress the importance of transparent risk allocation, performance-based contracts, and maintaining public ownership of core assets (AWWA-EY, 2019; Lima et al., 2021; Sowby et al., 2025; US Water Alliance, 2023; Gilliland & Gaines, 2021).

In practice, this can mean prioritizing PPPs for:

- Modular or ancillary projects (for example, industrial pretreatment, renewable energy at treatment plants, or specific reuse facilities) where risk can be clearly defined and limited.
- Design–build or design–build–operate contracts for discrete projects, with public control retained over rates and long-term strategic decisions.
- Situations where private partners bring specific capabilities—such as advanced technology or specialized project delivery expertise—that are difficult for smaller utilities to develop internally.
- Situations where the investor-owned utility model provides the best long-term solution for community needs and new economic development opportunities.

North Carolina can develop a PPP framework or guideline specific to water and wastewater utilities, drawing on best practices from the National Association of Water Companies, the US Water Alliance and academic literature, to assist local decision-makers. This would signal support for careful, context-sensitive use of PPPs while addressing utility fears of losing control or exposing ratepayers to undue risk.

Mitigation Strategy #7: Enhanced Oversight with Faster, Smarter Permitting

To balance environmental protection and economic development, additional regulatory oversight in critical regions should be coupled with streamlined permitting pathways. EPA and EFAB have recommended that states consider improved coordination among

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agencies, clearer guidance, and predictable timelines to reduce uncertainty around regional projects and consolidation (US EPA, 2025).

North Carolina can build on DEQ’s existing “one-stop” support for major industrial projects by extending similar coordinated pathways to large utility capital projects needed for regionalization, reuse, or major capacity expansions. Mechanisms such as conditional or adaptive permits, allowing projects to proceed under monitored conditions with clear triggers for adjustment, can help align regulatory caution with timely project delivery, particularly in dynamic hydrologic contexts. North Carolina can also expand local permitting delegation authority to new and existing program participants. Currently, even very large utilities with well-staffed professional engineering departments must submit certain water and sewer projects to NC-DEQ for engineering review and approval. This is an unnecessary regulatory requirement that adds delays and costs to capital projects.

Mitigation Strategy #8: A Statewide Plan that Guides Rather than Mandates

Regional and national experience suggests that statewide frameworks work best when they empower and support local decision-making rather than override it (NARUC & NRRI, 1996; River Network, 2022; Water Finance Exchange, 2023). The proposed North Carolina Water Competitiveness Plan should be structured to ensure that utility executives, utility board members, or local elected officials hold meaningful seats at the table when the plan is drafted. Their participation can help ensure that plan elements support local capital planning, resilience, and affordability goals while enhancing the state’s overall economic positioning.

Mitigation Strategy #9: Elevating Workforce Development as a Core Pillar

Finally, the workforce challenge openly acknowledged by the Chamber report should be framed as a central pillar of the competitiveness agenda. EPA’s 2024 water workforce report, GAO’s analysis, and multiple sector-specific studies all converge on the conclusion that, without deliberate investment in workforce development, utilities will struggle to maintain basic operations, let alone embrace new responsibilities (Environmental Finance Center Network, 2023; Paxton et al., 2022; U.S. Government Accountability Office, 2018; US EPA, 2024).

North Carolina can position itself as a leader by integrating water workforce initiatives into the broader economic development narrative. Potential strategies include:

- State-supported apprenticeship and internship programs within utilities, in partnership with North Carolina Rural Water, local community colleges and technical institutes.
- Tuition assistance and certification scholarships targeted at critical roles.
- Regional training centers that serve clusters of utilities.

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- Greater support for industry professional organizations that currently provide the bulk of utility workforce training.
- Communication campaigns with local Chambers, highlighting water sector careers as stable, meaningful, and technically challenging work that supports community prosperity.

These efforts complement the Chamber’s recommendations and the competitiveness agenda by ensuring a talent pipeline capable of building and operating the infrastructure on which economic development depends.

Utility-Funded Projects as Engines of Economic Growth

While much of the conversation around competitiveness focuses on how water and wastewater infrastructure enables private investment, there is powerful evidence that utility-funded projects themselves are significant economic engines. Economic impact studies by Charlotte Water and CFPUA provide compelling examples consistent with national research.

Charlotte Water: Capital and Operating Investments as Regional Drivers

Charlotte Water’s economic impact assessment, prepared by OneWater Econ and Raftelis, used IMPLAN input–output modeling to quantify the regional benefits of the utility’s spending (Charlotte Water, 2022). This report demonstrates that utility-funded water and wastewater projects are among the region’s strongest economic drivers. With approximately \$192 million in annual capital spending and \$138 million to operate and maintain those systems, Charlotte Water generates an estimated economic return of \$1.86 for every dollar invested. Each \$1 million in utility spending supports 10.9 jobs across construction, engineering, professional services, and the broader service economy, amounting to roughly 3,600 jobs supported annually over a decade of study. Looking ahead, Charlotte Water’s planned \$3.4 billion in capital investments between 2022 and 2026 was projected to generate \$6.3 billion in economic output and support more than 7,200 jobs per year during the construction period.

These findings underscore that utility investments are not merely maintenance expenditures; they are major contributors to sustained metropolitan economic growth.

CFPUA: Regional Growth Linked to Utility Investment

CFPUA’s economic impact report demonstrates similar benefits for the Wilmington metropolitan area (CFPUA, 2024). CFPUA’s 2024 economic impact analysis shows a similarly powerful relationship between utility investment and regional prosperity. Between 2013 and 2022, CFPUA invested an average of \$95.3 million annually in operations and capital projects. These investments generated approximately \$158 million

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in annual economic output and supported 1,023 regional jobs, producing an economic return of \$1.66 per dollar spent by the utility.

Each \$1 million of CFPUA spending supports 10.7 jobs in New Hanover, Brunswick, and Pender counties. CFPUA's planned \$709 million in investments for 2023–2027 is projected to generate \$250.6 million in annual output and support 1,467 jobs per year, reflecting a projected \$1.77 return on every dollar invested. These findings confirm that water and wastewater utilities are foundational economic institutions whose capital programs significantly strengthen regional competitiveness.

These are real, recurring local benefits that arise purely from utility-funded projects; before counting any private investment attracted by improved capacity and reliability.

Conclusion

The North Carolina Chamber Foundation's *Water Infrastructure Competitiveness Analysis* correctly recognizes that water and wastewater infrastructure are central to the state's economic trajectory. The report's recommendations, regionalization, data modernization, statewide planning, enhanced oversight, PPP use, and site readiness, reflect a serious effort to confront both current challenges and future opportunities.

From the perspective of a utility executive who values economic development and is predisposed to support the Chamber's goals, the key to success lies in how these recommendations are implemented. The academic and professional literature highlights legitimate concerns about mission alignment, unfunded mandates, governance and equity in regionalization, hydrologic constraints, cost allocation, PPP risk, regulatory complexity, local autonomy, and workforce capacity. Yet the same literature also offers clear guidance on how to mitigate these concerns.

If North Carolina can weave these mitigation strategies into its approach, the result will be a truly collaborative framework in which utilities are empowered partners, not reluctant implementers, of the state's economic vision. In that scenario, the Chamber's competitiveness agenda becomes a catalyst for sustainable, resilient, and equitable growth, strengthening both North Carolina's economy and the water and wastewater systems that make that growth possible.

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Kenneth Waldroup has 33 years of experience in the North Carolina water and wastewater utility industry, in both public and private roles. Most of that experience has been gained in utility leadership or management roles. He served from 2002 to 2009 on the North Carolina Environmental Management Commission, and in that period served on the water quality and water allocation committees of the Commission. He has decades of experience participating in regional water and wastewater planning organizations and has participated in or managed multiple utility consolidation agreements.

Kenneth is a licensed professional engineer, with graduate degrees in both Business Administration and Public Administration. He also possesses North Carolina Class A certifications in surface water treatment and water distribution, as well as certifications as local government finance and budgeting officer. He has served in multiple roles for state and national trade and/or professional organizations dedicated to our industry, including board and executive committee leadership roles.

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This paper was initially published on January 23, 2026. This revised version incorporates minor technical corrections identified during external review. Updates were limited to citation accuracy (author attribution, publication year, and DOI verification), typographical edits, and consistency between in-text references and the bibliography.

These revisions do not alter the substance of the analysis or the conclusions presented.

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